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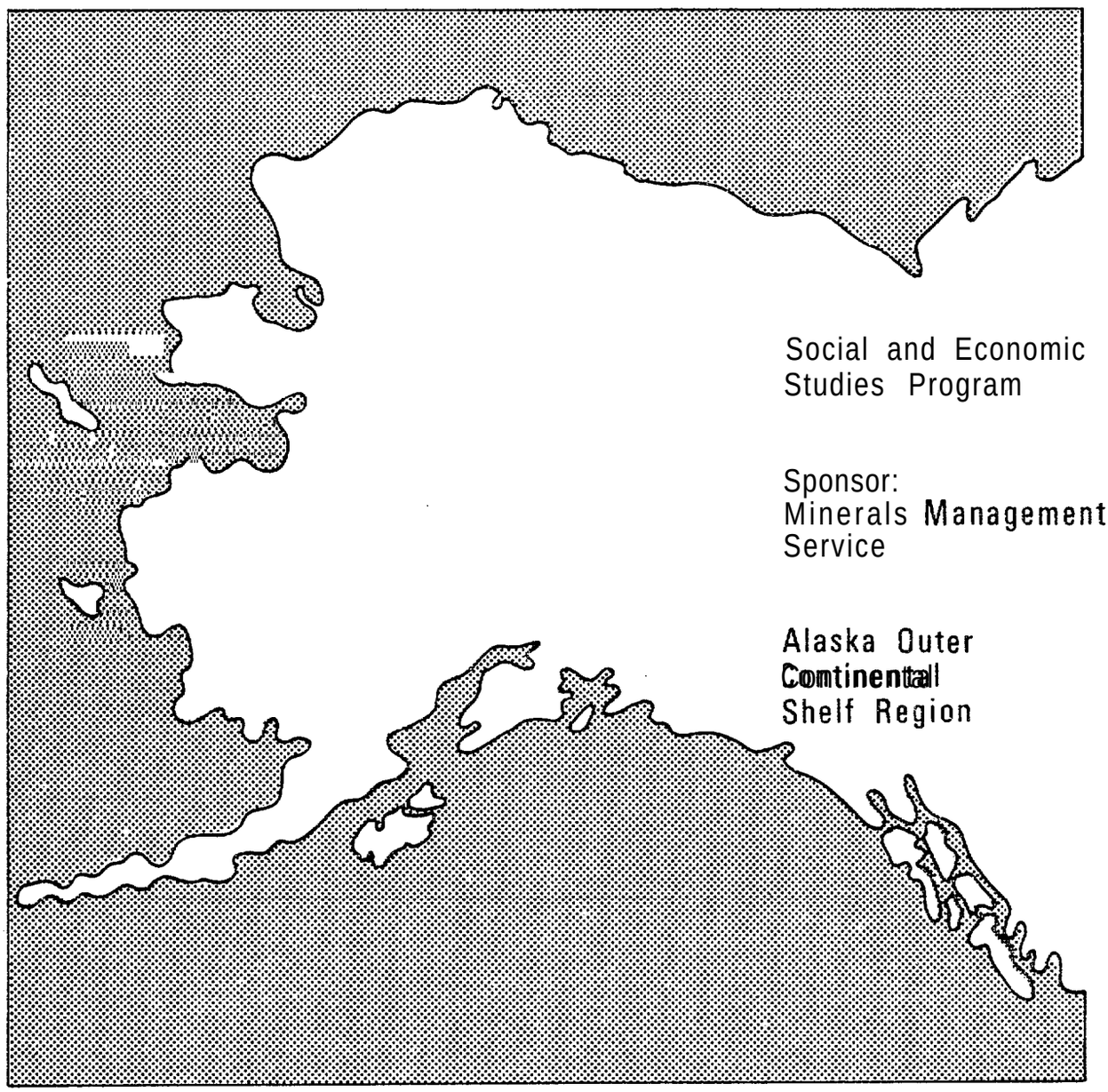

Social and Economic
Studies Program

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Alaska Outer
Continental
Shelf Region

Workshop Proceedings: Monitoring Sociocultural and Institutional Change in the Aleutian-Pribilof Region.

TECHNICAL REPORT NO. 126 CONTRACT NO. 14-12-0001-30264

ALASKA OCS SOCIOECONOMIC STUDIES PROGRAM

WORKSHOP PROCEEDINGS:

MONITORING SOCIOCULTURAL AND INSTITUTIONAL CHANGE IN THE ALEUTIAN-PRIBILOF REGION

PREPARED FOR

MINERALS MANAGEMENT SERVICE
ALASKA OUTER CONTINENTAL SHELF REGION
LEASING AND ENVIRONMENT OFFICE

PREPARED BY

IMPACT ASSESSMENT, INC.

DECEMBER 1985

NOTICE

Alaska OCS Socioeconomic Studies Program

Workshop Proceedings: Monitoring Sociocultural and Institutional Change in the Aleutian-Pribilof Region

Prepared by:

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Michael A. Downs, Ph.D.

This project was conducted under the direction of Mrs. Marsha Bennett-Walter and Ms. Karen Gibson, MMS Contracting Officer's Representatives. Mrs. Bennett-Walter was responsible for initiating the work while Ms. Gibson was responsible for its completion. Their contributions have been significant.

December 1985

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ABSTRACT

This document is a report of the results of two days of workshop sessions designed to identify and resolve some of the more thorny problems involved in monitoring sociocultural change in rural Alaska. The workshops were held at the Anchorage Sheraton Hotel between December 16-17, 1985 and attended by ten representatives from the Minerals Management Service (MMS), the Phase I contractors, and the current Phase II contractors including five leading authorities from the fields of anthropology, sociology, economics, and social impact assessment who were invited to address problems involved in measuring sociocultural and institutional change. The objectives of the meetings were (1) to assure a thorough understanding of the MMS objectives for the project, (2) to guarantee effective integration of the two phases of the project, and, (3) to enhance the technical, theoretical and methodological approach of Phase II contractors. While not called for in the contract, the need of the members of the EA staff to cite information contained in these workshop materials led us to agree to prepare these proceedings for publication as a technical report.

The two days of meetings were broken into four sessions, moving from the more concrete and empirical to the more abstract and theoretical. After opening remarks and roundtable introductions, Mrs. Marsha Bennett-Walter began the technical sessions with a discussion of the objectives of the Minerals Management Service, the contracting agency, in originally initiating the Monitoring Program. Dr. Charles Smythe and Ms. Rosita Worl, of the Chilkat Institute, followed with a presentation on the objectives of the Phase I sociocultural monitoring, field and methodological problems that needed to be resolved, and a discussion of additional variables that might be included in subsequent monitoring efforts. Mr. Michael Galginaitis then presented a summary overview of the field test of the Phase I monitoring methodology prepared by he and Dr. John Petterson on the basis of two weeks of field work in Nuiqsut, Alaska. John Petterson followed this discussion with a presentation of his technical evaluation of the utility of the Phase I variables and field protocols. These original protocols were evaluated along the criteria of applicability, utility, and cost efficiency. The final presentation of the first day of workshops, by Dr. Michael Downs, addressed problems inherent in utilizing fixed variables to monitor sociocultural change within a rapidly evolving social, political, economic and cultural context.

The second day of workshops opened with a presentation by Dr. Richard Nelson focusing on problems inherent in charting long term, as opposed to short term, sociocultural change. Dr. Larry Leistritz followed with an extensive and detailed review of active socioeconomic monitoring programs, their models and assumptions, successes and failures, and the bearing of their approaches on monitoring sociocultural change in rural Alaskan communities. Dr. William Freudenburg's presentation focussed on the role of the project's theoretical perspective in resolving the problematic issue of selecting appropriate monitoring variables. Dr. John Petterson then led an open discussion of the protocols that had been developed by Impact Assessment, Inc. for use in the Phase 11 field data collection. Dr. Charles Wolf's paper, addressing the reciprocal relationship of study objectives to government policy, concluded the final day of working sessions.

The goal of actually monitoring institutional change across time is a result of three fundamental shifts in MMS objectives. The first shift evolved as a natural consequence of the increased availability of information, an *a priori* requirement of monitoring of social change, The initial years of the program had logically been committed primarily to the development of baseline databases which dealt with issues of immediate concern to EIS writers. The second shift resulted from a gradual recognition of the fact that many important social changes occurred as a result of unpredictable causes, over relatively short periods of time, and across multiple social domains. The original, necessarily rudimentary, lineal model utilized to appraise real or potential lease sale effects, that is the "baseline--post development" approach, was manifestly unable to identify causal relationships due to the multitude of intervening events, many of which were far greater than the oil-related event itself. The third shift came with the evolution of data collection techniques designed not only to establish both measurable quantitative trends but to gather sufficient information to actually interpret those trends within the prevailing social and economic contexts (both at the local and state levels).

The sociocultural monitoring program is designed to fill a significant gap in the MMS SESP series. The baseline, socioeconomic, sociocultural and ethnographic studies series of MMS reports provided detailed, high quality analyses of conditions and events occurring at a certain point in time. The participants of the workshop agreed that it is perhaps impossible to assess change or to weight the relative significance of different events based on data collected at only one point in time. It was also agreed, however, that a series of studies and restudies, where they failed to effectively demonstrate both continuity and change, or the interrelationship of events, could not provide an understanding of the causal relationships that brought about change in the community. A social indicators approach, for example, even if firmly grounded quantitatively, provides only an understanding of two points in time with little theoretical or empirical means of linking points A and B.

The objective of the monitoring project, of which these workshops are but a part, is to provide a continuous record of the course of institutional change over an extended period of time, in this case, a five-year period. If this approach is successful, it will allow the MMS analyst to gauge the relative importance of the different external and internal events that have acted to bring about particular changes. By combining both the qualitative and descriptive approach of the monitoring methodology with the more quantitative primary and secondary data series we hope to develop a finely detailed and instructive picture of the relative weights of different events and forces influencing social change among four rural, isolated communities of the Aleutian-Pribilof region of Alaska. To the extent this second phase of the monitoring program is successful, it will serve as an important foundation upon which subsequent monitoring efforts in Norton Sound and the North Slope regions of Alaska will be based.

PROCEEDINGS

Sociocultural Monitoring Methodology Workshops
Anchorage, Alaska, December 16-17, 1985

Conducted for

Alaska Outer Continental Shelf Office
Minerals Management Service

by

Impact Assessment, Inc.

These workshops were intended to be working sessions in which specific questions and issues involved in monitoring institutional change in the Aleutian-Pribilof region would be addressed. These workshops were designed to maximize the utilization of the expertise (in the form of invited speakers) available. We did not intend to present polished pieces of finished work, rather, the introductory talks were intended primarily to set the stage for the working sessions themselves. The primary objective of the whole undertaking was to reach a workable consensus on what are the important issues involved in monitoring sociocultural change in rural Alaskan communities.

The research needs of this particular study dictated the order and organization of the workshop sessions. Papers were presented from a ground-up perspective. The focus of the first day's sessions was on the relatively more pragmatic, on-the-ground methodological concerns and problems. We began with a review of the process of designing the sociocultural monitoring program (Marsha Bennett-Walter's talk), through a discussion of the results of the Phase I North Slope project and methodology development (Chuck Smythe's and Rosita Worl's talk), through the field test of the methodology (Michael Galginaitis' and John Petterson's talks), through application issues pertaining to the Aleutian-Pribilof region (Michael Downs and John Petterson's papers).

The second day's workshops dealt with higher-order methodological questions. Richard Nelson's session on the use of institutional change as the methodological focus of the research, Larry Leistritz's talk on the selection of appropriate socioeconomic indicators of change, William Freudenburg's discussion of the theoretical problems of identifying appropriate measures of change, and Charlie Wolf's discussion of the policy implications of accelerated resource development all dealt with increasingly abstract methodological concerns, theoretical issues, and policy implications of monitoring sociocultural change among rural Alaskan communities. A final paper on the rationale for use of particular protocol questions was distributed by John Petterson and used as a focus for the final working period.

The workshops opened with remarks by C.P. Wolf on the process of institutional analysis in general, and some of the themes that were to be developed over the course of the workshops were introduced. C. P. Wolf, who chaired the workshops, is the director of the Social Impact Assessment Center, as well as General Editor of the Westview Press Social Impact Assessment Series, and

author of Social Impact Assessment, Social Impact Assessment and Environmental Design.

The first paper presented was by Marsha Bennett-Walter, entitled "Organization of the Studies Program and MMS Objectives in Monitoring Sociocultural Change in Alaska."

Ms. Bennett-Walter is the Contracting Officer's Technical Representative for this Phase II effort and was the COTR on the Phase I project as well. Prior to coming to the Minerals Management Service {then BLM) in 1979, Marsha conducted over eight years of social, economic and cultural studies in and around the Gulf of Alaska. These projects resulted in the reports "Choices for the Coast" for the Alaska Coastal Policy Council (1977), "Design Determinants for the New Capital" (1977), "Social Impact of the TransAlaska Pipeline on Valdez" (1976) sponsored by NIMH, and "A Profile of Five Kenai Peninsula Towns" (1977). She is also first author of the MMS (BLM) Technical Report #36 on the sociocultural impacts of the Northern Gulf of Alaska petroleum development, has contributed to innumerable MMS Environmental Impact Statements, Statements of Work and Study Designs, and is currently conducting a ten-year follow-up restudy of the community of Valdez, Alaska, the terminus of the TransAlaska Pipeline and transshipment port.

The focus of Ms. Bennett-Walter's session was the feasibility, utility, and cost of longitudinal monitoring of social change in communities affected by current and future OCS lease sales. Her topics included the adequacy of the shortened list of variables identified in the Phase I portion of the project and employed in the Nuiqsut field test, the common elements among diverse political opponents to MMS Lease Sale 92, and the influence of extra-regional organizations that affect institutional change in the Aleutian-Pribilof region.

Marsha Bennett-Walter: Presentation by the Minerals Management Service

This summary should provide an introduction to MMS decision-making and expectations both prior to Phase I and now entering into Phase II. Commentary by MMS staff after this presentation should provide further clarification of issues, concerns and directions for the Phase II effort.

The Social and Economic Studies Program (SESP), now a part of the Environmental Studies Program, was established and continues to maintain itself primarily as a service to Minerals Management Service (MMS) staff and management. The primary users of SESP publications within the Alaska OCS Office have been the various authors of Environmental Impact Statement (EIS) sections and Secretarial Issue Documents (SIDs).

While numerous state and local officials, social and environmental scientists, and other interested citizens all use SESP reports as well, the users within the OCS office significantly influence a study from its first stages as an idea, through the review and revision of a statement of work, through the review of technical proposals submitted, and finally by review of subsequent products of the research effort. By the time a final report is submitted, these EIS authors and SESP professionals have worked intensively with the study contract staff, and have reviewed the reports they have written. Also, by this time, expectations for a study have brushed up against the reality of what a particular contractor can accomplish given the constraints of time, budget, and professional expertise. What finally is used in an EIS or SID results from these and other compromises. Additionally, an EIS has an important constraint in the form of a page limitation. An analysis of any one report cannot be too lengthy since several reports form the basis of the analysis in a given EIS section, which itself is must conform to acceptable length standards. The following discussion of sociocultural monitoring assumes this relationship between the research process and the ultimate users of this information. It also shows the influence of ideas, developments and issues outside the OCS office which influence the study process and its products.

The Final Statement of Work (SOW) for Phase I was completed by the Alaska OCS Office, Social and Economic Studies Program, in mid-November, 1983. Several months of drafting and revision had taken place prior to issuance of the final SOW. It would be April 1984 before a Request for Proposals (RFP) would be issued by Procurement Branch B, a Technical Evacuation Committee formed, and Proposals evaluated by staff at the Alaska OCS Office.

Although social scientists at MMS recognized the mandate to monitor the sociocultural environment, consensus on what topical areas and variables to study were difficult to achieve. Outside anthropologists suggested an institutional emphasis. Within MMS, it was finally determined that the institutional arena would be the focus of analysis, and that the most institutionally complex OCS region, the North Slope, would be the starting place of a several year effort.

Much effort was expended in the RFP in specifying definitions of variables, pointing to relevant Literature, and in building into the Phase I effort an appropriate framework. Unlike some other RFP's, this study solicited responses from a broad spectrum of firms all across the U.S. and Canada, but received bids from only those contractors who were already well known to the SESP. In retrospect, the topic was not well researched in other parts of the United States and Canada at the time. It may have been that local knowledge and a difficult new area were formidable obstacles to less familiar researchers.

The standards of evaluation in the original RFP specified what MMS expectations for the North Slope methodology should be:

- How well are cause and effect relationships established?
  How replicable is the methodology by other researchers? What are the limits of replicability?
  How relevant is the study to future oil and gas development of the region under study? To the future without oil and gas development?
- How feasible is the monitoring program to implement in terms of cost, data availability and other factors?

In this workshop, we will be consciously addressing the issues of replicability in our discussion of the Nuiqsut field test. On the other hand, cause and effect relationships are not well established in Phase I and should be better specified in Phase II. Relevancy appears to be good for the North Slope work, as measured by interest shown by local North Slope institutions in the results of the research so far. Feasibility and cost of a long range program need to be discussed and elaborated further in this workshop.

The Minerals Management Service staff chose the Chilkat Institute approach for the Phase I research because it offered a dynamic institutional analysis, sensitivity to the special characteristics of Inupiat formal and informal organization, and an awareness of the importance of unique individuals in leading Inupiat regional life. The Chilkat group consisted of Rosita Worl and Chuck Smythe, principal writers and analysts, Taylor Brelsford, Research Associate, and Tom Lonner and Steve Langdon, Senior Consultants. The monitoring domains developed were appropriate to North Slope Institutional development, and the actual questions used in the field were distilled from a long period of "brainstorming" about appropriate domains and variables which could accurately encompass the 1979-1983 period on the North Slope and the Aleutian-Pribilofs. This range of domains is not meant to be exhaustive, however. It is expected that the issues of continuity and difference will be important topics of discussion at this workshop.

MMS reviewers have been largely reactive in responding to Chilkat's technical memoranda and reports, suggesting refinements and additions or deletions where redundancies or perceived difficiencies in topical areas and variables occurred. Response to Worl and Smythe's oral presentation of their findings were generally positive. This presentation, given in November, 1985, evoked numerous questions about Wainwright, Barrow, and Kaktovik institutions, populations, and trends.

Some of dynamism of the original research proposal was lost in the sheer volume of institutional data necessary to complete the final report on Phase I. Additionally, less time was spent on the key whaling complex institution than might have been desired, due to the inaccessibility of whaling captains during the study period. The sensitivity of the topic of leadership, given the extraordinary changes which occurred with the transition to George Ahmoawok as Mayor of the North Slope Borough, may have prevented as open discussion of Leadership as had earlier been anticipated in the proposal. These fundamental changes could not have been anticipated by any contractor at the outset of the study.

The transition from a long list of domains and questions to a much abbreviated one should be considered carefully in the light of future applications

of the methodology as well as the Phase II effort. This shortened list should be an important focus of this workshop. MMS expectations for the Aleutian-Pribilof Phase II study centers on assessments of what research has already been done in the region and on how a methodology developed for the North Slope could be fitted to the special circumstances of Aleutian-Pribilof communities.

While not as extensively developed as the North Slope, the Aleutian region and the Pribilof Islands are primary staging areas for OCS leasing exploration in the St. George, North Aleutian Shelf (Bristol Bay), and Navarin regions. Oil tankers from as far away as Norton Sound are projected to use Unimak Pass close to Dutch Harbor-Unalaska as a gateway between the Bering Sea and the Gulf of Alaska and points south. Small service bases for current offshore oil activity already exist near Dutch Harbor-Unalaska and on St. Paul Island. Air traffic in service of offshore oil comes and goes using Cold Bay Airport.

Of additional critical concern for monitoring of sociocultural effects is the current high level of social stress in the Pribilofs as the result of discontinuance of the government-supervised fur seal industry on both islands. The current Aleut management of the program and settlement have created added stress, less certainty about the future, and anxiety concerning other economic alternatives. These conditions are not stable "baseline" conditions but, like the North Slope case, reflect cumulative sociocultural impacts from a variety of sources rather than a sociocultural system in long-term equilibrium.

With a strong focus on methodological rigorousness and creativity and with concern to maintain the highest standards of knowledge in the Aleutian-Pribilof area, the Technical Proposal Evaluation Committee chose Impact Assessment, Inc. to complete Phase II of the sociocultural monitoring program. The RFP for Phase II reflected the concerns of MMS social scientists and the data needs they identified. It was more specific and directed than the Phase I SOW, largely because the Phase I effort had already created a broader base of understanding on which to narrow the scope of the upcoming effort. Like Phase 1, Phase II did not attract a number of non-familiar bidders. In fact, the number of bidders declined over the period, leaving only some of those who had bid previously on Phase I.

The North Slope study benefited from local high interest in monitoring on the North Slope and a radical shifting of post-Capital Improvements Project governmental structure. The resulting stance of the Mayor and his staff to these changes has been extremely self-aware and bold. These conditions are, in may respects, quite different from those found in the Aleutian-Pribilof region. There may be less enthusiasm for sociocultural monitoring in these communities, as compared with those studied on the North Slope. If this is the case, these differences in receptiveness will also affect the study and its evolving methodology.

For the Aleutian-Pribilof region, an example of one kind of monitoring might focus on the fisheries-dependent communities and institutions which oppose Lease Sale 92 (Bristol Bay). A recent advertisement in opposition to this sale lists supporters, which include a number of Aleutian-based fisheries groups and communities. By mapping out opponents to this one lease sale, one can ask a number of intriguing questions including the following:

1. Why are some Aleutian communities listed and some not?
2. Which communities are part of this organized protest?

3. Which communities are not?
4. What are the characteristics of both types of community in terms of participation in various fisheries and what is the relationship of this participation to opposition to lease sale 92?

The interdependency of communities and fisheries-based organizations from the Yukon River to the Aleutian-Pribilof region points to the importance of non-Aleutian-Pribilof institutions in evaluating and monitoring institutions in the Aleutian-Pribilof region. This issue of regional boundedness should also be carefully considered in the present workshop context.

This paper briefly summarizes the role of the Minerals Management Service in the conceptualization, design, contractor selection, review of documents and evaluation of final products for both the first and second phases of MMS sociocultural monitoring study. The first phase was completed in October, 1985, completing over one year's effort concentrated on North Slope institutional growth and change, from 1979 to 1983. The second phase will concentrate on Aleutian-Pribilof institutions, growth and change, primarily since 1971. Fieldwork for the Aleutian work will take place in early 1986. While the study areas are different, many commonalities exist in the approach to monitoring which will be completed in each area.

It is important to the success of this project that we understand why we want to do sociocultural monitoring in the first place, and once we have determined our objective, why we choose the North Slope to begin our effort. It is also important to understand why the contractors who were choosen were selected, and why we chose an institutional focus instead of another focus.

The key issues in earlier studies on the North Slope in socioeconomic and anthropological research had to do with institutional development. These appeared to be issues that previous studies had indicated were at once important, and at the same time directly observable and quantifiable. When we are talking about institutional development we are talking about organizations such as government, voluntary organizations, political advocacy organizations, all the groups and organizations of a political nature, religious organizations, or for that matter, any organization or group that is any way active on the North Slope.

We view institutional development as important because it was something changing in response to all of the other changes that were occurring on the North Slope. It is chance, utilizing a single format or class of data, to combine and contrast all that is changing with what is stable. Of course, one of the large challenges is whether or not we are able to differentiate between the dynamic and the static on the North Slope, whether or not the institutional changes are indicative of the dynamic and the static parts of the social system, some of which are monitored and some of which are not monitored. The overarching question seems to be to what extent is it possible to come up with a measure of the totality of dynamic and static aspects of a social system?

Discussion following Bennett-Walter's paper: It is significant to understand why these two regions were chosen for this study, particularly the North Slope area. The North Slope area is interesting for several reasons, but a couple stand out. First is the level of institutional development, particularly under the auspices of the North Slope Borough. Institutional formation rates have been phenomenal, and importantly, much of this formation has been in response to

oil development. Also of importance is the fact that Western style institutions have been formed to protect aspects of traditional culture, society, and values. The North Slope Borough was formed explicitly in response to oil development, and the Alaska Native Claims Settlement Act, which has been a tremendously influential law on the institutional level, was also formulated as a direct result of economic and political pressures associated with oil development.

Nelson: Another issue raised in the discussion is that one must be careful about focussing on institutional change, and equating this with the totality of cultural change. There are many aspects of life significant to local populations which are changing that are not reflected in institutional changes. Perhaps "the bottom line" should be keeping track of perceptions of "quality of life." A related issue is that there are fundamental differences between Western and Native institutions, and these need to be understood, but it is also the case that when Natives form Western-style institutions, there is a considerable overlap with existing Native institutions, both in style (which renders them different from the same institutional forms when utilized by Westerners), and in individuals who participate in the new institution. These continuities with the past which underlie and blend with contemporary changes must be understood as well.

Allen: It is clear as well that it must be kept in mind that part of the charge of the MMS is to not only to study, but to mitigate as well, the impacts of OCS development. Assuring local participation in the study process is a mitigating measure in and of itself, and provision of information on the local level allows a greater degree of local control as well, but this is clearly not enough. Research must be sensitive to these larger needs.

Wolf: "Institution" has turned out to be one of the most difficult terms to grapple with in social science. In that respect it is like "community," but at least with community there is some kind of focal/spatial reference. How is it that the MMS got committed to an institutional approach in constructing monitoring system? Be that as it may, it seems like there should be some contrasting of institutional with non-institutional behaviors. Institutional seems to mean here organized group or collective behavior, but there is a whole field called "collective behavior" that deals with non-institutional phenomena or phenomena which are in the process of becoming institutionalized. An example of this process is where a religious organization moves from a sect to a church. On the sect end you have collective behavior which is non-institutional given the prevailing religious definition. Non-institutional behavior is important to understand, and in some theories changes in non-institutional behavior is the real indicator of change. Take the example I just gave: It's not to say that there wasn't a religious institution there, it's to say the ground under its feet moved, and the way it was handled traditionally had to adapt to a change in reality. The direction of adaptation normally is formalization. So, using a political example, you create the North Slope Borough, and what was handled informally back in the village, now you have a formal institution about. If you are talking about the institutional approach and institutional dynamics, then it's this institutional process you need to focus on and collect appropriate data.

Bennett-Walter: As an agency we have two constraints. Without OMB approval we cannot do questionnaires of individual people. This means that we have to use key informants and this somewhat drives us to a higher level of research abstraction and analysis. The second constraint is that it is difficult to send the contractor out with sufficient dollars to study everything. We tend to try to focus the research with regard to these constraints, and in this case,

it has driven us toward something we felt that we could track both using key informants and staying within the budget limitations.

Another point raised in the discussion was the question of do we really know what institutional change indicates in a sociocultural system?

Wolf: What institutional change means to me is that it is an indicator of redistribution in the allocation of, and access to, cultural goods in different categories. It is a modification of an existing system whereby the cultural materials are organized and distributed. It is a change in that pattern of relations.

Downs: The type of change that we see in institutional change with formalization is a process of linearization. That is where decision making moves from lower-level to higher-level entities within the social structure. Lower-level controls are routinely bypassed in favor of higher ones. You also see the process of promotion, where a group that has a particular resource or specialty generalizes their influence, and access to that particular resource comes to have greater value in the new scheme of things, such as the increased value of being successfully able to utilize bureaucratic structures. People, actually a group of people, that have that particular resource are promoted in importance within the social structure. You see institutionalization of higher order social control through the formation of the borough or other regionally-based political/economic forms as opposed to the continued prominence of political roles formerly allocated to smaller groups. In either process, you have specialization within the social system, and a type of stratification that wasn't there before.

There are several different things that you can see that are basic to the organization to the group or set of community, that you if you can't see directly through institutional formalization you can at least get an indication of it taking place. Linearization is where the decision making process moves from the grass roots level and is systematically bypassed, kicked up to a higher and higher level.

Comment: On the issue of focussing on the institution, for the most part the institutions that are monitored are fundamentally Western, and the ones Chuck Smythe talked about as being significant are largely non-Western institutions. It's important to not just to focus on institutions but what kinds of institutions are going to be studied. These are two different kinds of institutions and so far the weight of research has been on institutions that are fundamentally Western. There needs to be a more equal balance between those that are Western and those that are traditional.

Freudenburg: Why are we studying this and what does this have to do with the quality of life?

Discussion: It changes the pattern of access to culturally valued resources, but it may or may not change the overall level of cultural valued resources or the quality of life.

Smythe: We have look at the need for local control and we decided that from what we know, the issue of local control was central to cultural well-being. On the North Slope, the adoption of Western institutions was to maintain local control over their land. The only core thing to study, really, other than utilization of the land, and the resources on the land, is government

institutions.

Worl: The most effective methods of mitigating have to do with public participation. If you do a research project and then share it with people who are effected, you do more than anything else to help them get control of their own lives and use that information constructively.

Freudenburg: What is it that people require to have a good quality of life? Everyone has to have shelter, access to food, control over their fate politically, and the chance for personal development.

Charles Smythe and Rosita Worl: Presentation by the Chilkat Institute

The second paper of the session was presented by Charles Smythe and Rosita Worl of the Chilkat Institute. Entitled "Monitoring Methodology and Analysis of North Slope Institutional Response and Change 1979 -1983," this paper was a summary of the findings of the Phase I portion of this study project.

Rosita Worl was co-author, with Charles Smythe, of the MMS "Monitoring Methodology and Analysis of North Slope Institutional Response and Change, 1979-1983," and "Report on the Economic Status of Alaska Native Women," and first author of "Sociocultural Assessment of the Impact of the 1978 International Whaling Commission Quota on the Eskimo Communities," and "Sociocultural Assessment of Proposed Arctic National Wildlife Refuge Oil and Gas Exploration." Charles Smythe was the author of "Pribilof Islands Field Report," and "Pribilof Islands Skills Rehabilitation Plan."

The focus of Worl and Smythe's session was the extent to which the five data collection issues will be generalizable to enable their use in other regions. Do they provide sufficient indices of change? How can they be used to assess significance of change? They also addressed the issue of what length of time constitutes a useful monitoring interval for these variables.

Worl: First of all, we found this project to be really very exciting. We have mentioned to you some of the rewarding things in terms of people's response to it, and the utility of our report to the people of the study region. The work in itself was very challenging. One of those challenges was this: how do we do contract research when we have been trained to do academic research? Academic research has quite different goals and moves at a different pace in terms of working on tight deadlines. A basic question to be asked is how compatible are the two types of research?

There were two objectives of the Phase I study. First was deciding what to analyze for institutional development and change and, second, to design a monitoring methodology to focus on cumulative sociocultural change. The major focus of the Phase I was on institutional development and change.

The project started off with a Literature review, which was a major undertaking, The literature reviewed included that on institutional development and change along with literature on traditional cultures and traditional institutional forms, specifically those of Alaska and the Arctic, and social change and economic development in general among American Indians. It was basically from our literature review, when combined with our knowledge of the North Slope, that we developed the seven research domains in a series of discussions and workshops.

After we developed our monitoring methodology, we went into the field. We had outlined three phases of fieldwork to be done. The first phase was protocol visits to the communities. We have found that it is good start for involving the people, and it is important to set forth the objectives of the research early, to let people know what is going on. It does a lot to establish cooperation in the communities. The second phase was to collect the descriptive data on institutional development and change. At this point we walked into the field in the middle of massive change. One of the things about the North Slope that needs to be appreciated is that it a very dynamic region and that area is

always changing. There are elements of the culture that are always changing. It is a region that changes and that is probably one of the strengths, its dynamic nature, which allows its traditional culture to persist.

Then we came back to our third phase, the write-up. These are our general findings. As you know we looked at three communities. These communities were selected because we thought they were representative of the North Slope community as a whole, and they were selected because of their economic diversity and their proximity to industrial development. In general what we found with respect to internal structure was that the communities ranged on a continuum, with Kaktovik at one end and Barrow on the other.

In Kaktovik we found a community that was characterized by a high degree of centralized control. Barrow's institutions, on the other hand, were specialized and diversified and control was dispersed among the many institutions that were within that community. From the analysis of our data we found that five issues emerged as significant in monitoring institutional development and change. These issues were not only significant, but also were issues we thought that could be monitored within the constraint of limited funding and time. These five issues were population, political control, land, business development (including wage employment), and housing.

Kaktovik is a community that features centralized control through of a high degree of communication and cooperation between institutions. The two main institutions to be monitored are the city council and the Kuukpik Corporation, the village ANCSA corporation. While technically they are two separate institutions with two different names, in actuality they seem like one institution in many respects. Each institution is responsible for certain independent activities, but in fact it is the cooperation between the individuals who sit on the board and the council that makes it look like one institution.

What we found in Kaktovik was that, in spite of all the development activities and changes that the community endured, the permanent population maintained control over its community. A couple of things that came out as really important in maintaining control had to do with land issues. Land to the Kaktovik people means two different things. It means land in terms of lots within the community or village site. It also means land outside of the community that is important for subsistence or as wildlife habitat.

With formal land ownership, they began to treat land within the community very differently from land outside the community. Within the community, they exercise a high degree of control over the lots. They approve of who can receive a lot. In this respect they are acting very much like a tribal government. They are deciding who can live in their community. Associated with the Iand is housing. The North Slope Borough was the primary agency that built new houses. There was strong concern about who lived where. Outside of the community, their concern is not so much for ownership and control of land, but the concern is for the protection of subsistence, the protection of the wildlife and the protection of the environment. When it comes to attitudes toward development, they allow development as long as it doesn't interfere with the wildlife or environment. They monitor the development closely and they have an agreement that if it should impact on the wildlife then there would be a meeting with the oil companies.

An additional aspect of village life that the city council became very

involved with was employment. They approved who could get the permanent jobs.

In terms of the issues of local control over housing and employment, Wainwright is similar to Kaktovik. The city council speaks on behalf of the community and exercises power on most issues. It has problems over distribution of lots and housing in the village. In housing they exercise the powers of a traditional council, but they did not tell people where they could live. They didn't want whites separated but, rather, integrated into the community because they saw them as a benefit. This may have to do with relatively small non-Native population of ten percent.

Wainwright has a much longer history of formal institutions than Kaktovik. The cooperative store was started about 1916. There has been a governing council since that time. The IRA council started in the 1930's. In the recent period there has been development of several voluntary organizations, an example of which is the search and rescue team. The previously informal search and rescue team became formally institutionalized in the late 1970s for the purpose of holding bingo and other fund raisers. In effect it is still organized as a traditional activity as all the men always contribute their services when the need arises.

Other similar cases were the development of the Mother's Club that helps families in need, and the organization of the very active dance group, which is involved with preservation of traditional culture.

Barrow has all of the institutions seen in the other communities and more. In Barrow, we see a dramatic increase, approximately thirty-five percent, in the population from 1979 to 1982. Most of that increase is non-Native and is composed largely of adults seeking employment. The result of this population increase is the formation of different social groups in addition to the Native ones. The population influences the political system in many ways, the most direct of which is through voter participation. In terms of business development, the number of business licenses increased from thirty-five to two hundred new businesses.

Housing from 1979 to 1983 was scarce. As business expanded there was need of additional employees, and they recruited labor from outside of the community. This meant that they had to build housing. CIP funding from the Borough went to such things as housing, roads, utility systems, public service buildings, power systems, and airports, and all of these projects, of course, meant employment and more money coming into the community.

Smythe: The five issues that have emerged as being important to monitor are;

1. population
2. land
3. employment/business
4. housing
5. local political control

These several issues are significant to Native communities and are interrelated. For example, land is directly related to both concerns of subsistence and political control. It is important to realize as well that these people are living through a series of "major issues" and their lives are being

impacted not only by OCS issues but all of the other things that are going on simultaneously. These are issues that are important throughout the state, and these are issues that we must assess and monitor.

Another topic that needs to be addressed is that when we are monitoring change, how often do we have to go back? It seems, based on past experience, that five years is too long of a period and that every three years is probably the most appropriate interval for significant fieldwork. It is important, however, to state that a monitoring system is not periodically but continually used, even between the field periods, as there are a lot of data that can be obtained from a distance and a lot of these data are quite valuable.

Discussion following the paper: There was concern expressed over the difference between the terms "issues" and "domains" as they have been used. Smythe's response was that a domain is a broader area of concern. "Issue" is used in relation to political questions or very narrow variables. As soon as the term "issue" is used, it constrains the area of concern. Although there have been changes between the draft and final reports, we are not replacing the domains with issues. The domains are still there, though more compact, and they are used in the analysis. The issues are discussed at the level of the indicator. They are the result of boiling down the question of what are the major processes that should be traced in that particular development situation. Issues are important in how the data are collected rather than interpreted. The data are interpreted in terms of a domain, which, bringing the focus back to a cultural level, means the focus is on measuring change.

Another comment: One of the things that needs clarification is the identification and analysis of issues, so that a more definite relationship could be stated between some kinds of indicators, such as between demographic and others. It was stated that the demographic indicator is a indicator of conflict over economic opportunity in regards to employment, etc., but how does this help the MMS do the job that they are supposed to do? Does it apply to other communities, or are we learning about the basic functioning of a particular socio-environmental system?

One of the things that needs to be done is to be able to predict what will happen if there is a tremendous increase in contracting opportunities or other employment opportunities. These communities show patterns of community response and development both in situations where there has been a lot of contact and in others where there hasn't, and that needs to be addressed. Although oil companies employ very few local people, there probably would be a great deal of impact from other effects on an area.

Another point brought up in the discussion following the paper was the necessity of looking in a precise way at the stimuli (signals) that are precipitating changes within the community. It is not enough in a community profile to just look at sociocultural changes from the "receiving side." To do a competent profile one has to look at the "sending side" as well. When it is understood what kind of activities these companies going to undertake, then one will be able to have an indication of potential consequences for the receiving community. There could be some pressure on resource systems outside of lease areas because of development within the lease areas, and this issue needs to be addressed as well.

Michael Galginaitis: Presentation for Impact Assessment, Inc.

The third paper, entitled "Summary of the Nuiqsut Field Test of The North Slope Monitoring Methodology," was delivered by Michael Galginaitis.

Galginaitis is the primary writer of the MMS "Ethnographic Study and Monitoring Methodology of Contemporary Economic Growth, Socio-Cultural Change and Community Development in Nuiqsut, Alaska" and is currently preparing his doctoral dissertation based on his fieldwork in this community in 1982-1983. Michael was also the co-field researcher on the Field Test of the North Slope Sociocultural Monitoring Methodology with John Petterson. His session and paper focussed on ways of improving the collection and interpretation of unobtrusive measures of institutional change, particularly those that can be quantified without recourse to (or reliance on) informant-provided information, the identification of regional- and community-level differences and interactions, and the problem of maintaining informant confidentiality in the process of collecting important yet sensitive information.

In summary, following the domain format of the Phase I research, here are a few of the things we found that have changed in Nuiqsut since my previous research:

Population: The total population of Nuiqsut has increased from 271 to 343 since the baseline study in 1982-83, which is seventy-two bodies or twenty-seven percent. This has been overwhelmingly Inupiat, as the non-Inupiat net increase has been one, while the Inupiat net increase has been seventy-one.

Non-Inupiat in Nuiqsut are still mainly transient and fully employed. The only non-Inupiat long-term residents are married to Inupiat women and were in Nuiqsut in 1982-83. Only one non-Inupiat died in Nuiqsut in this period, and this was due to a plane crash. The number of Inupiat deaths is not clear at the present. But the number of Inupiat present in Nuiqsut in 1985 who were not there in November 1982 is about 85. Of these, twenty-nine percent could be attributed to natural increase, thirty-seven percent to the immigration of six totally new household units who already had relations in Nuiqsut, and thirty-four percent to the immigration of individuals who joined or rejoined pre-existing homes. The population structure is basically similar to that of 1982-1983, but is becoming younger. Fertility seems to be high both among long-term Nuiqsut residents and incoming household units. It can be expected even with no continued immigration, that the village population will continue to increase. This will increase the load on the school and other village facilities. However, the school and housing supply have a fair amount of unused capacity at this time, so a growing population should pose no short-term problems in terms of village infrastructure.

The housing availability is, of course, rather sparse and the housing is rather spartan. Population will pose a serious problem in terms of economics, availability of jobs and such. The spatial distribution of households does reflect social divisions and status evaluations within the community. This is mainly the result of the patterns of allocation of the newer housing when it became available. Case studies of the -exceptions within the spatial distribution are revealing of the social rules or values. Such an evacuation is dependent on researcher familiarity with the community, however, and thus it is difficult to use in a monitoring connection. The problem of confidentially also becomes a problem.

Business development and the wage economy: The situation at the time of the field test was comparable to that of the field work of 1982-83. However, this is essentially an artifact of the time of year that the research was done. Wage labor on the North Slope has tended to be seasonal, concentrated in the summer. Thus the statistics and tables of both periods of field work reflect the permanent employment positions in Nuiqsut which are relatively stable, and they say little about the important seasonal opportunities which do not exist during the winter time for the most part. The permanent wage jobs in Nuiqsut have stayed at pretty much the same level but the nature of seasonal opportunities is in the process of changing.

The North Slope Borough and Kuukpik Corporation, which is the village ANCSA corporation for Nuiqsut, supply most of the jobs in Nuiqsut. The North Slope Borough through the CIP program used to supply many of the seasonal jobs as well. Many of them were within the village. The CIP program has ended for all intents and purposes. Oil exploration has increased and is seen as a partial substitute. Oil related jobs are more permanent than seasonal in nature and introduce a new work rhythm, however, and so will require an adjustment on the part of employees. This has begun as the number of oil related jobs has increased greatly from 1982-1983. More significantly, the typical "Nuiqsut Inupiat" attitude toward oil development has changed from resistance to that of recognition of economic force which Nuiqsut will have to adjust to. The attitude is one of "do we have a choice?"

This attitude is also seen in the village toward the road connecting Nuiqsut to Prudhoe Bay through the Kuparuk oil fields. Again general opposition has given way to a recognition of the economic benefits such a road would have. Nearly all villagers want such a road built, and the social problems which would result are things that they have not as yet wanted to think about. Most people agree that a road will not significantly effect employment opportunities.

Political control: The community schism between Native insider and Native outsider is more obvious than ever, which translates pretty much to Kuukpik Corporation shareholder versus Kuukpik Corporation non-shareholder. This is reflected in the corporation/city council tension, and perhaps in the active whaling crews from Nuiqsut. All active captains from Nuiqsut have connections with the Kuukpik Corporation and are of course Kuukpik Corporation shareholders.

Most of the inactive captains, inactive for the past five years, are not connected with the Kuukpik corporation in that way. Their lack of activity may reflect the difficulty they face in Nuiqsut of mobilizing the community resources needed to actually go out whaling. The Nuiqsut case study tried to show the persistence of a pattern of leadership basic to the whaling crew model. There still seems to be good evidence for this. However, this model is being adapted so that women, as leaders, may fit into it. Women are assuming more leadership positions in Nuiqsut. Historically, women did not go on whaling crews, but in Nuiqsut at least one crew has a female who goes out in the boat. Nuiqsut has also had a female mayor, Kuukpik corporation has one female officer and several female board members. Several community organizations are virtually exclusively run by females.

The idiom of leadership and distribution of scarce resources continues to be that of whaling. The tension between the corporation and the city during

the tenure of the female mayor was said to relate more to her style of leadership, which did not fit within the idiom of whaling, than to the fact that she was a woman. This is a topic for discussion however, and not a written monologue. The political tensions between the Native and non-Native are not mentioned in the summary of the field test as they are not really evident within Nuiqsut. The city of Nuiqsut has relatively few non-Inupiat residents, and very few as long-term residents. Most non-Inupiat are North Slope Borough employees and thus in essence work for the villagers. However, the non-Inupiat at Prudhoe Bay work for outside, private companies and are beginning to form a more permanent residential base. They are lobbying for formal recognition as a city and are registering to vote in the North Slope Borough. They wish to obtain North Slope Borough services for their community and there is also talk of running a non-Inupiat candidate for North Slope Borough mayor. Many informants believe that the day when Inupiat are a minority on the North Slope is not that far off. The implications of such a development must be a concern for anyone interested in the future of the North Slope. We have to be able to talk about when majorities become minorities and vice-versa, and how it affects social structure and the process of change.

Subsistence: Detailed information on subsistence activity can never be part of monitoring program unless a great deal of time is spent on it. However, it was quite clear that 1985 was a much better year for subsistence activity than 1982. People were getting more wildlife than in the earlier period. Subsistence is seen as a political issue, that is, there are a lot of questions about unrestricted access to land and sea. These questions are clearly more open than in the past, and it is just as clear that this is an important concern to the people of Nuiqsut. The increase in the number of whaling crews would indicate this. The decision to whale is not necessarily a economic move, although substantial economic resources are necessary for this activity. The increased concern within the village corporation over how to protect Nuiqsut's access to the land into the future, is another indication of the importance of this issue.

Community Facilities: The development of community facilities demonstrates that things have remained pretty much the same rather than changed in this regard. The school is still the primarily recreational focus for children and young adults, even with the opening of the community center. The airport terminal is finished but not opened. It is too expensive for the airlines to operate it. Operations are as before, with periodic shutdowns after enough accusations of skimming and other such activities have been made, followed by a startup with most of the same people in charge. Water and oil delivery systems are essentially the same. Waste pickup is somewhat more efficient, and much more regular.

Major changes: After we had been in Nuiqsut for three or four days people began asking me what the most obvious change I saw in Nuiqsut since I was last there in 1982 and 1983. They were essentially reversing the question I was asking, My answer varied depending on the person who was asking, but usually involved the obvious physical changes such as the new housing that had been built. However, it had became clear to me that there are two or three changes which seem to be more significant than others, One is the decline of the CIP program. The second is the general attitude of villagers toward oil development. Third is the overall operation of the school. I think that one thing that tied all three together is that all three are basically beyond the control of the residents. So in a very real sense people in Nuiqsut are more responding or reactive than active. That does not mean that they are not important in the process, it just means they are not initiating the process.

The decline in the CIP program was a decision made by the Borough, but it was directly related to the declining price of oil, and as such it was clearly beyond the control of North Slope residents. The lack of adequate physical control over many of the CIP projects did not help and not doubt contributed to the failing of CIP as a political issue in the last election. But outside economics, that is the market for and the price of oil, has played a major role. The North Slope Borough could not afford the CIP program. The general attitude of the village population toward oil development and the road to Prudhoe can be said to be related to the fact that aside from oil development, few economic opportunities exist on the North Slope.

When I left Nuiqsut, this is what I gave as my answer about the major change. The school is ostensibly under Nuiqsut control, but the local school board is advisory only, and the North Slope Borough school board is influenced by non-Inupiat professionals. The changes which have taken place in the school are for the most part seen as very positive by the community. The changes are also a result of the school principal and staff. The principal gives quite a bit of credit to the parents of the students for getting their children to school on time and such. But many regard this as public relations more than anything else. The school officials have finally molded this school into a standard system that they think a school should be. One of the recommendations of the school advisory board made, aimed at raising the level of academic achievement, was to make Inupiat language courses optional.

Beyond the ethnographic information, the theoretical issue that I wish to discuss is the process of collecting data efficiently. One of the main issues for me is how do we go about improving unobtrusive measures? Refining unobtrusive measures to the point where they are a useful data collection procedure is important for several reasons. I think that basically if we can get away from badgering people and still collect good information well be a lot better off, and I also feel that you can collect information from good records faster than you can collect information from people. Perhaps more importantly, it is certainly less bother on the community if you can do it that way. In many cases as well, unobtrusive measures can be collected by the subject population itself once they are adequately defined.

In this regard I think the analysis of what we call census information can be a useful unobtrusive measure. It is a list of people who are present in each household with age information. It can be done with talking to a limited number of informants, and in this sense, you gather information about a large number of people, and do so by only talking to a few people. While that information may not be completely accurate, it is much faster to collect than going out and enumerating the village each time you need this information. It does allow you to construct demographic type information and allows you to talk about household structure and spatial distribution. It is important for several of the things that we want to do to know what kinds of people you have in what kinds of residence, and it tells you something about what is valued and what the hierarchy is. I would call most of those measures unobtrusive because you are not canvassing the village, or a large number of people to get that information.

As for subsistence data, at least the subsistence component of the villagers diet, you call talk to storekeepers about what is and is not being sold. This would be intrusive to that storekeeper but unobtrusive to the people of the village.

Discussion following the paper: What people view as obtrusive or unobtrusive seems to depend on what kind of information access the community has to the outside. In this case it is not very much.

Observations on unobtrusive measures: What we need is an observational methodology, and we need an attitudinal methodology, and we need a statistical methodology, and these things need to converge. This is what triangulation means, or at least it is one meaning of triangulation. This way you can use different data sources to cross-check yourself and your analysis.

Wolf: This is similar to Roger Barker ecological psychology. You identify behavior settings such as church meetings, ball games, and so on, and then you observe who is present at different periods of time. But this is labor intensive, and realistically, you often end up interrupting what you are looking at. What we need to figure out is what is it that we can come in and look at or get without being obtrusive in the community which can supplement data that we gather in other ways.

Petterson: I don't think you can ever replace somebody being there gathering the data on a periodic basis. But you could get a lot more out of that collector than you are getting now. It reduces the amount of key informant interviews that you need, and allows the effort to be a lot more focussed.

Galginaitis: There is a serious question about what is considered private and what is public and where those questions fit in with needs of the MMS. We have to recognize that there are sensibilities that exist in the population that is under study that have to be taken into account too. Take an item such as criminology, which most anthropologists consider to be critical information about a community. Often, however, communities like those on the North Slope consider this information, though technically "public," a matter that is to be private to the village. We have to ask what is the MMS entitlement to someone else's private, or even sacred, knowledge. The answer to the question is that you can't violate an individual's rights to confidentiality, and the solution to that problem is making sure the analytic level is elevated to the point where what you are saying is to important the conclusion, but the rights of privacy are protected. The MMS's job is to get a handle on the impacts of oil leasing (and extraction if there is ever any oil found offshore), therefore you want to focus on what would be significant variables to know about if we ever find any oil.

If you have a fair idea of your methodology before you go into the field, and if you go out for protocol visits in the community, you can say we are looking at these domains and these are the following variables we are going to ask the people questions about, and if you have any problems let's talk about it now before we start talking to individuals. That way the community is helped to understand what the research process is, and to be a part of it in a meaningful way. I think then that a monitoring study has the opportunity to look at fewer variables in more detail and with more perspective and is less of an intrusion on private areas than a number of other studies might be. If you put people in the field for a long period of time you have the opportunity to find out very private things about people, but if you are in a community for a short time with a specific purpose and limited range of data collection needs, the situation is different. The possibility of misusing what you have may be greater because the empathy as developed in a long-term study isn't there, but then again the data that you have may be not be as detailed, and is more focussed. It still comes

down to a question of how well you maintain your ethical responsibility at the tail end of it.

MMS Comment: What kinds of bias does the researcher bring to the research area? Another problem is how do you coordinate research of two different scales? It is clear in this case that to do a reasonable job you must look at both the local and regional level. If you just look at the community you don't get a sense of the effects on the regional level as well, and it is clearly the case that changes in policy or economics at the regional level have direct consequences on the local level. I think in order to understand the local community it seems you would have to understand the region. There are regional process going on that you can see in a village but you can't study at that level, such as migration.

John Petterson: Presentation for Impact Assessment, Inc.

The next paper delivered at the session was by John Petterson, entitled "Evaluation of the Nuiqsut Field Test of the North Slope Monitoring Methodology."

John Petterson is co-author of A Systems Approach to Social Impact Assessment: Two Alaskan Case Studies. He was Principal Investigator "on a three-year NSF study entitled "Limited Entry and the Native American Fisherman: A Case Study of the Bristol Bay, Alaska Salmon Fishery," and Principal Investigator on the MMS studies entitled "North Aleutian Shelf Non-OCS Forecast Analysis," "Unalaska: Ethnographic Study and Impact Analysis," "Cold Bay: Ethnographic Study and Impact Analysis," and "Sociocultural/ Socioeconomic Organization of Bristol Bay: Regional and Subregional Analyses." He is the Principal Investigator on the current Phase H of the MMS Sociocultural Monitoring Project.

The focus of this session was on the degree to which monitoring should concentrate on assessments of change as opposed to the assignment of causes and associated effects. That is, should we, in the monitoring process, attempt to tie particular effects to particular causes? Can we assign relative weights to the incremental effects of OCS development?

In the monitoring process we will attempt to tie particular effects to particular causes. The problem comes in deciding how much emphasis should be put on differentiating the effects of OCS leasing from the multitude of unrelated causes. Can we, realistically, even assign relative weight to the incremental effects of OCS development?

Basically the technical evaluation of our Nuiqsut work was to examine our attempt to replicate the methodology from Phase I. The protocols listed in the Phase I documentation were not used for our research, rather we used those five issues the Phase I researchers subsequently determined would be most effective measures of change in the region. We found that those indicators were good and useful indicators of change but we also felt that additional variables should be used, which is to say that these issues were necessary, but not sufficient, to monitor change effectively.

In the process of doing the field study itself, a lot of other issues came up that were directly pertinent to the reliability or precision questions that we were asking, and these include the additional methodological considerations contained in the written text I have supplied. I would be more than happy to respond to any ideas that people have on any of these. In the technical evaluation I discuss how we were using triangulation and approaching similar problems. Additionally, I discuss how this study is related to other studies. I would urge you to look for any of the additional methodological considerations or evaluation criteria and select one that you are particularly interested in, find weaknesses with our approach, and ask any questions that you have.

Let's start with community size. In our experience it has become apparent that size of the community is a primary consideration when one is building theories of change and trying to understand change as it has occurred. How big is the community is a crucial question, because if it is a community of fifty people, then it takes you no time to discover that there certain dominant variables, and there are dominant families that control much of the social

organization of the community because they control access to the only employment available locally. It is also readily apparent which political factors and factions are the most important. The larger the community is, the more opportunity for differences of opinion there are. There are political, social, or economic differences of opinion. There are more different values that are being maximized.

The first thing you notice when you walk into a community is its size. Everyone collects population information, but few discuss why. You have to ask what do we know about a community whose population changes over ten years. To say that the population has increased ten percent basically tells us nothing. It is worthless as an indicator until we look at what this change is composed of and what it means in the community in terms of the social organization, and the people's reaction to the change. If you just state the total population you lose something. In fact it is confusing because what is really happening is this: we have to look at each point in history to see what we can say about population. We have to understand long-term trends, that is, we must see the background against which short-term population fluctuation is happening, and, more specifically, we must understand who within the community is being affected, and how they perceive the situation.

Let's look at employment. The same questions apply. If we see the population go up and we see employment go up on a graph then we can talk about the relationship between these two. Then if we break this profile down into ethnic composition, and if we see that "a" is the increase in Native population, "b" is this increase in "others," and "c" is the increase in whites, then we see where we are today and begin to make some meaningful interpretations. When we juxtapose these things, such as ethnic composition, population profiles, and employment figures, we can begin to say, with some degree of confidence, that something is going to happen here, such as differential rates of migration and ballpark numbers of total outmigration should the employment figures change in a particular way. It is important that we be able to operationalize this.

What does all of this mean to the MMS? This is how we go about constructing models of what is going to happen given a particular set of stimuli. The first people to come into a community as a result of a economic boom, or economic changes in resource development, are typically Euro-American, more or less skilled people, who have only a minute chance of remaining in the community once the resource development has been terminated. We can predict on this basis a disproportionate share of the population moving out (these Euro-American individuals). We can also say that the "other" ethnic category will decrease. Then the Native population, which has been experiencing natural increase and not in-migration (but a relative decrease), will then experience a relative increase (along with the continuing absolute increase).

Another example is what happened with the CIP program. Everyone knew that CIP would go up like this (steep slope) and come down. They didn't think it would keep going up. They knew that the CIP program had a certain profile when it started. They knew that at some time there wouldn't be any money to support that. We know that sooner or later they will extract all of the oil from the North Slope. We know that OCS employment is going to be primarily non-Native, and we know that they (the outsiders) are going to take the bulk of high paying jobs. We also know when the oil starts running out, the first people to leave the area will be the non-Native population. We, the outsiders, perceive the "natural" trends of these things, but that really doesn't tell us how the local population experiences

these changes. For that we have to talk to local residents. How do locals react to the non-Native population moving in to the permanent jobs that North Slope Borough offers? They also move into the private sector jobs. Non-Native people hold many of the good jobs, and they are also beginning to acquire land and housing. What do you think will happen when the jobs go out, and the local Native population sees their entire bureaucracy is white and high paid? What I expect to happen is there is going to be a political upwelling of opinion and hostility toward the the domination by non-Natives in the community. When there is no money for the other people, the Native population, there is going to be a lot of pressure for the non-Natives to leave and replace them in their occupational positions with Natives.

There is also the problem of how you define a resident and determine who is sharing the effects. To sort this out we have to look at the entire contour of community change, not just population, but also housing, subsistence, etc., and all the other value questions. You have to look at a population that is there before, during, and after a project. We don't need to monitor people that come into a place to just work then leave when the project is done. We must look at the context of change and understand the relationship of what happens when the entire context of the community changes. This is what happens when the resource base shifts from one type of resource to another.

I don't think you make a monitoring methodology without having an adequate baseline. You can select variables and use them, but things change, and you see things change. You might want to take a little longer perspective to see what it looks like in the baseline case, so you have to have a thorough baseline. If you then select variables and as things change and you see the variables aren't doing what you need them to do, there has to be sufficient flexibility in your protocols to incorporate those changes.

Comment: I'm not satisfied with population as an "institution." I think it is an institution called family. Biological maintenance of a population is a institution called health. Population then, I feel, is a joint function of family and health. Population isn't an institution. Population tells you how many people are in various categories but it doesn't give you a sense of what holds these people together.

Comment: Is housing an institution? I would specify that under the institution of shelter. Housing is not a helpful indicator as far as I am concerned. Changes in these impact categories are significant and what the protocols should tell us is how we detect significant change.

Michael Downs: Presentation for Impact Assessment, Inc.

The next paper, delivered by Michael Downs, was entitled "Aleutian-Pribilof Applications: The Problem of Significance of Variables in a Changing Context." Michael was the primary field researcher for the MMS study "Unalaska: Ethnographic Study and Impact Analysis." His doctoral dissertation is entitled "Sociocultural Change and Ethnic Identity: The Effects of the Alaska Native Claims Settlement Act in Unalaska, Alaska" and he is one of the two field researchers on the Phase II sociocultural monitoring study in the Aleutian-Pribilof region.

Downs: The main problem I wish to address is this: how does one assign significance to the shift in a monitoring variable when the context within which the variable is set changes radically? To illustrate this type of problem, two case studies from the Aleutian-Pribilof region will be briefly considered. These are the community changes precipitated by the decline in the crab fishery in Unalaska and those generated by the withdrawal of the NMFS from St. Paul. In the face of these fundamental community structural changes all other social indicators or measures of institutional change pale in significance. A second problem arises out of the first one, and that is how does one go about formulating regional-level models and monitoring methodologies for regions like the Aleutian-Pribilof area in which there are communities structured around several fundamentally different organizational principles?

The main problem then is, in part, a temporal one relating to changes in community organization through time, and the second problem is a spatial one, related to applications across communities in a single time frame. The same indicator, or level of institutional development, or demographic trend, will mean two different things in two different communities (spatial), and two different things within the same community at different times (temporal). This is to say we must exercise care to contextualized our variables in two fundamental senses, and in a host of secondary ways. Let us consider the second problem, the formulation of regional model for divergent communities in a single time frame, first.

There are some basic problems associated with regional level analysis which need to be addressed. What are the assumptions, usually unstated, which presume this is a region in the first place? In what sense is it a region? Is it a region based upon a geographic contiguity (related to a set of natural features such as islands or bodies of water) or is it a region based on a physical resource regulation zone, such as an OCS lease sale area? Both of these are instances of regional definitions organized on essentially non-human parameters with respect to local populations. Other times regions are defined with reference to organizational likenesses among the communities of the area (that is, the communities resemble each other in their general structure), or existing degrees of cultural and/or political bonds between the communities of the area. If the area one wishes to monitor is characterized as a region based upon its natural, and not human attributes, then one is faced with the interesting (and frustrating) paradox of dealing with issues of human cultural continuity and change within essentially non-cultural parameters. Even if the area under consideration is classified as a region on the basis of the attributes of its population characteristics, are these attributes selected as representative of an internal cultural continuity as perceived by the outsider? This is always a potential problem, because this externally perceived internal consistency may represent historical legacies, and not be indicative of contemporary interactions.

Let us look at the Aleutian-Pribilof region. The Pribilofs are considered part of the region due to the historical relations between the human populations on those islands and the populations on the Aleutian Chain. Uninhabited at the time of contact, the Aleuts living there today are the descendants of the population transplanted there by the Russians, and since then there has been a considerable degree of population flow to and from the Chain. The communities of the Chain are considered a region because of their relation to a geographic feature (the Chain itself) and a past cultural continuity (they were originally Aleut settlements). However, the communities of the region today are culturally, politically, economically, ethnically, and organizationally diverse. Let us review very briefly a few organizational attributes of some of the communities in this region.

Atka: A small, ethnically homogeneous Aleut community. Relatively isolated, both in terms of distance from other settlements and frequency and intensity of interaction with outsiders. Compared with other communities in the region, a significant portion of the young people of the village speak Aleut. Considered by other residents of the region as "the last bastion of Aleut culture." Very low development of commercial economy. Only 8 full time jobs. 91 residents, 89 Aleuts. High subsistence use.

St, Paul: Ethnically homogeneous. Aleut community, but the economic organization is (or has been) structured around the commercial seal harvest. There is a high level of subsistence resource use in this community as well, however, the commercial economy is the dominant aspect of the community. High level of interaction with outsiders, at least on a superficial basis. Popular tour destination for wildlife observation. Population of approximately 500.

Unalaska: Heterogeneous non-Native community. Aleuts are a small minority in a population of approximately 1,900. The social, political, and economic organization focusses on the commercial fishing industry. Characterized by an extraordinary level of involvement in the commercial economy. Employers lament that there is too small of a pool of potential workers to draw from. Much entrepreneurial activity as well. Community structure is influenced to exceptional degree by external commercial and governmental forces.

Akutan: Is close to Unalaska, has several links to the community. City manager of Unalaska is the former city manager of Akutan, there are some kinship links, and the commercial economy of Akutan is also based upon the commercial fishery, which has direct links to the fisheries in Unalaska. However, Akutan is a small Aleut community, and the seafood processors are kept at a distance physically and socially. Low level of direct involvement with the local population. No local ownership of commercial fishing vessels.

St. George: Cannot be considered in isolation. If one were to take a strictly biological perspective, one would probably

have to consider the two Pribilof communities a single population. Approximate population of 160. Multiplicity of kinship and friendship ties between the two communities. It is part of a dyadic system.

The Invisible Communities: Adak and Shemya. What is the rationale used to decide that these communities are not a part of the region? The example of Shemya is a difficult one, because of its highly sensitive security nature. Adak, however, supports the largest population on the Chain (5,000; as opposed to the other military enclaves Shemya, 1,100; and Attu, 45 only), has a Nation Wildlife Refuge headquarters and a diverse population which utilizes local resources, and so on. These are interesting examples of groups that we do not consider communities in contemporary times, but certainly would if we were to take a historical or archaeological perspective, or even a cross-cultural perspective.

Excluded communities: in other studies not only have diverse communities been lumped together, other which logically (from a cultural, historical, and contemporary organizational perspective) should have been viewed as regional communities have been excluded. With the MMS program this tends to work out quite well, but in other studies where regions are drawn strictly on proximity to a particular resource (without conscious regard to human organizational factors) communities with strong historical and contemporary ties have fallen into separate analytic regions, which in turn influences the regional analysis. (This does happen to some extent, however, in the Aleutian/Pribilof region with respect to attempting an analysis of the economy, an important cog of which is the fishery, which includes a fishermen and vessels from all over the state, and indeed, the world, as well as being tied to an international market.)

How then to best mitigate the problems generated by a diversity of communities when attempting a regional level analysis? One aspect of the monitoring methodology must take regional diversity into account, and gather monitoring data from the various communities. Often, there will be natural nodes of information for more than one community. For example, it would be relatively easy to collect data for both St. Paul and St. George from St. Paul, due to the high degree of interaction between the two communities and their institutional overlap. Other commonalities exist between other communities. For example, the city of manager of Unalaska is the former city manager of Akutan, and can provide numerous insights because of this personal history and allow access to a regional net of data. Analogous data can be accessed for the fishing industry in both Akutan and Unalaska, as virtually all of the supervisory personnel in Akutan formerly worked in Unalaska, and retain social ties there. Anchorage is another natural node as well, due to the fact that several businesses active in the region, as well as indigenous regional organizations, have offices there. For example, individuals who work for the Aleutian/Pribilof Islands Association in Anchorage have continuing contact with the communities they serve and are sensitive to general trends of change in each of the communities. They are also likely to be astute observers of social processes in their community of origin.

The individuals performing a regional level analysis must be flexible enough in their orientation to adjust the monitoring program as "natural" pathways of information within the region change as specific individuals move through the regional structure and as the relationships between institutional structures change.

The main issue that I wish to address today is a temporal one: the problem of variable monitoring within a changing context. That is to say, the issue I wish to address is how does one interpret changes in particular variables when a community as a whole changes through time, and, in extreme case cases, changes its organizational attributes?

As I mentioned above, we will look at two examples of this process from the Aleutian-Pribilof region. First is the decline of the crab fishery in Unalaska. Unalaska was, in 1979-1980, the number one fishing port in the United States in terms of dollar value of catch landed. Since then, however, the catch has declined precipitously. This boom and bust cycle has had the effect of swamping all other economic variables within the community as individuals and institutions sought to adapt to rapidly changing conditions. The fishing industry has been forced to diversify: the fishermen, the processors, and the shippers. The local government expanded at an impressive rate, and was left with an institutional inertia which began groping for less than ideal solutions to the problems associated with a contracting economy. Population movements resulted as well from this changing climate: for many leaving the community was the most viable option when faced with low profits or losses on the institutional level and unemployment on the individual level.

In St. Paul it is generally held that the economy must diversify as federal subsidization of the seal harvest was withdrawn. The result of the federal withdrawal from the Pribilof harvest is as dramatic as the crab decline in Unalaska, but there are strong differences between the two. In St. Paul, virtually everyone was involved with the seal harvest in one way or another for six weeks, and for the rest of the year there was little employment within the community. Economic uncertainty provokes a different response in St. Paul than it does in Unalaska. For the vast majority of individual residents, the Pribilofs are their communities of origin and orientation. Leaving the community, as Unalaskans have done, is not a viable option for them. St. Paul, unlike Unalaska, is an ethnically and socially homogeneous community, and community leaders are concerned about maladaptive personal and social consequences of the changing context. (St. George, though commercial sealing was halted there several years ago, does not provide a good model for what will happen on St. Paul in so far as noted above, the two are part of the same system. Additionally, the interactions between community institutions in the two settlements are quite different.)

What happened in both of these communities with a change of context was a radical shift in the perception of the desirability of oil development in the region. In Unalaska, when the fishery was enjoying a period of vitality, public opinion was quite strong in opposition to oil development. With the onset of the local (relative) depression, oil money became an attractive prospect, especially for those businesses which would be able to act as support services, and for the local government. In St. Paul, a similar shift occurred with the NMFS withdrawal.

What is the relation of these activities to something like the whaling complex on the North Slope? Do these act as a "focal social complex?" Both are pivot points of social organization, but a change in one has different

significance to the acceptance of other changes. In both the Unalaska and St. Paul cases, attitudes toward oil development and other activities underwent a 180 degree change with the respective economic declines, both of which were unanticipated and largely unanticipatable. It is doubtful that changes in the North Slope whaling complex in and of itself would have such broad-based implications. Perhaps what is needed is the elaboration of a "focal social complex" model.

There are problems with the idea of a focal social complex. There are a number of different foci of any particular society, and the roles these focal institutions serve are multiple. For example one can, and people have, described the pivotal social form in St. Paul as the Russian Orthodox Church. Others see the future of the Island, and therefore the center of the society, as resting in the hands of the TDX Corporation. Still others see the future, like the past, as inextricably tied to the commercial viability of the fur seal harvest.

There are several dimensions to consider. No one can know the future or absolutely predict responses to change, even those within the system, beyond the most general statements. People live in the present, not in a hypothetical future. It is the current context that individuals and organizations are adapted to. The literature is fairly rich with examples of things that come to be valued that were not (consciously) highly regarded earlier, things abandoned which were considered central, and the continuation of cultural traditions that anthropologists considered to be dying out. One can only say what it is that people are interested in now, and what their concerns are, and make plans accordingly. What this is to say is that there needs to be a ongoing monitoring program to keep a finger on the pulse of the community. Trends of change even on key-indicators cannot be interpreted out of context.

Then there is the notion of "preadaptation," which needs to be examined and adjusted for. There is a differential degree of compatibility between communities with regard to particular trends of change. For example, Unalaska is preadapted to types of change that involve distant marine resource exploitation. That is to say a new form of distant marine resource exploitation, such as offshore oil extraction, is not particularly incompatible with current community configurations: it will not disrupt current activities. Second, there are present facilities and services that will directly benefit from oil exploration and extraction related activity. Unalaska's economy is now based on distant extraction of another set of marine resources (the fishery), and similar support services are required for each.

There are several general conclusions to draw from the Aleutian-Pribilof regional experience. First is that community-level differences are fundamental, and must be taken into account in any regional monitoring methodology. Second, community organization may change radically in short periods of time, and the monitoring programs must be sensitive to this process. Third, natural lines of communication and nodes of information exist between communities and these must be accessed to make the monitoring process as efficient and comprehensive as possible.

Questions to consider:

1. How does one formulate a constellation of variables so that the influence of several background variables can be addressed when examining the influence on the community of the primary study

variable? Can variables be hierarchically arranged, and is it useful to do so? (Need to understand the social and cultural ecology of the community. What are the relations between the various institutions and values within the group?)

2. Is there a focal social complex in every community, similar to the "whaling complex" on the North Slope, that is seemingly tied to all other aspects of social organization? The whaling complex may be a special case of a "focal social organization," but when compared to other regions, it seems an exceptional institution.

3. How does one determine whether certain variables are central or peripheral to the social organization of the community, which in turn will determine the community's response to other vectors of change? (Need emit and etic perspectives. Only possible with sufficient field research. Variables must not only be normative, they must make intuitive sense to the study population.)

4. Can one develop a "gestalt" of the study community (or region) against which change will be measured, and how does one then monitor shifts in that gestalt? (There are very basic questions that need to be addressed, such as why do individuals choose to live in a particular place. Is it the community of origin and orientation for most of the residents? If so, what is the proportion of adults who leave the community? If they perceive themselves as free to leave, but stay, what is the attractiveness of the community for them? If outsiders move to the community, what is it that attracts them? If the particular circumstances which drew the outsiders to the community were to change, would they then be likely to stay?)

Comment: Maybe there is a reason to look at the economy of what ever place we are interested in terms of it being a part of something larger. If you never look at the regional level and you only focus at the community level, then those impacting forces and those networks aren't visible, the actual way the system works is not clear, and can't really be monitored.

Richard Nelson: Presentation of an Invited Paper

The next paper, entitled "Gavamana Suli Inuavaa? Looking at Long Term Change," was delivered by Richard Nelson. Richard is the author of Hunters of the Northern Ice. Hunters of the Northern Forest, Shadow of the Hunter: Stories of Eskimo Life. Harvest of the Sea: Coastal Subsistence in Modern Wainwright, Make Prayers to the Raven: A Koyukon View of the Northern Forest, and The Athapaskans: People of the Boreal Forest.

Nelson addresses several important issues. First, he asks: Is the focus on formal institutions an adequate means of monitoring sociocultural change within Alaska Native communities? Second, to what extent should a broader range of social and cultural patterns from outside the institutional context (e.g., subsistence activities, world view, religion and ceremony, language and personality) be included in the field protocol? Third, what level of public participation should be involved in the monitoring process and how should such participation be incorporated into the analysis and report? He also asks "What constitutes an adequate and appropriate time span for measuring or assessing change?" Finally, he addresses the issue of the relationship between qualitative and quantitative data.

Nelson: I have to admit my innocence on this subject. My experience in sociocultural monitoring research dates back to a couple of months ago when I started reading all the reports that I could get my hands on of MMS. My only qualifications are those of an anthropologist who has observed change in rural Alaskan communities for 20 years, tried unsuccessfully to predict its future course, and always found it a fascinating subject.

If there is one thing that has impressed me after spending time in Alaska it's the complexity of cultural things, cultural behavior, the way people think, the way they behave, the way they perceive the world as members of a particular culture.

Every instant of human life is shaped and colored by our particular cultural background. Culture runs to the very deepest levels of our existence, or our emotions, our values, and our perceptions of how the world is ordered, of our judgments of good and bad, right and wrong. Everything we think and do reflects the conditioning of our life by our particular culture. Then if we add to this the pervasiveness and complexity of cultural existence, then we have to deal with its subtlety. We are still as social scientists and anthropologists trying to improve our capacity to observe and understand behavior in other cultures and to translate our observations into meaningful terms in our own culture. We are just learning to perceive the dimensions of cultural behavior and to put these into words that somehow translate the fullness of other cultural experiences. In other words, we are are trying to speak meaningfully about behavior and tradition that we are hard pressed just to see. We have great difficulty just learning to perceive the incredibly subtle dimensions of cultural behavior and put these into words, and the behavior and tradition that we might be hard pressed even to see might have great importance and emotional content among the people we study.

Culture is in a constant state of change. We are trying to record and explain and understand change in a quantity that is so enormously complex that I don't know if we even understand what it is. I cast out a few words of warning that we must not underestimate the complexity of the thing we are looking at. We

cannot underestimate the pervasiveness, complexity, and subtlety of cultural behaviors that are being affected by development and other changes in rural Alaska. If these cultural changes in rural Alaska are to be explained, documented or predicted meaningfully, we have to first acknowledge that there may be no simple, no cost-effective shortcut way to do it. I say this, because after twenty years I have plenty of my own errors and misjudgments to go by... To appreciate the full complexity of the cultural processes that are happening, don't look at too few things, and you must look over a long span of time. Don't always listen to just what people say to you. There is a difference between views and ideas that people express verbally and what they will do when push comes to shove. This is the difference between the ideal and the real, and it takes time and effort to find out where those differences are.

Here [the North Slope] you have an example of rapid change in the culture with a resurrection of tradition. Culture and change are terribly complex. It is easy to misinterpret what you see happening in the short run or not to see enough to allow you to correctly analyze the situation. My conclusion is that if we want to document and understand change, our research has to embrace a vast array of variables and it has to cover a long span of time. How can we try to perceive the fuller magnitude of cultural change?

I think of one way to do it is to try to tap the local perspective on change, to intensify some of the work that has been done. We need to gain the deep and longer term perspective on change that can come through fairly intensive discussion with local people and intensive observation of their day-to-day life. I think the local perspective should be brought prominently into this kind of work and combined with that very important prospective of the researchers themselves. Researchers see things that local people don't, and that's an extremely important point. I would like to see the researcher's external view now combined with the local people's view of change and its significance. These are qualitative assessments, but are they aren't any less valuable and significant as indicators of change.

Much of culture is beyond measurement by quantitative means. Are we choosing protocols for research because they are subject to repeated measurement rather than because they add meaning to the assessment? A balance is needed between quantitative information and qualitative data. Collecting this kind of data takes a lot of time. Information comes from the amount of time allocated to it. I think MMS should think about longer term research with this balance in mind of various kind of data, especially for baseline information. An important thing that we need to realize is that the government effort of mitigating the effects of OCS development is going to be contained within the limitations of the sort of data that we now seem to be constrained to. It is important to establish long-term relationships with communities.

For the perils of predicting change I would offer the example of my Wainwright study. From what I could learn about changes before 1964-66, and what I observed at that time, led me to conclude that 'subsistence' would vanish in the next generation. Younger people weren't learning to hunt, and among other things education a big factor. What actually happened was the younger generation learned these things later on when outside forces, like threats to whaling, catalyzed things. My short-sighted and simplistic view led to a completely erroneous conclusion because I didn't appreciate the full complexity of cultural processes, looked at too few things, and looked at too short a time span. Also, I never would have dreamed of the overwhelming changes of the past ten years.

Another example is the Kutchin study. This involved a similar misjudgements of culture change, but for a different reason. The Kutchin seemed very open to change, compared to Inupiat, and my observations led to a conclusion that they lacked commitment to their own culture and subsistence lifeway. Here the major cause of my error was accepting people's expressed attitudes about change and tradition. What actually happened was that the Kutchin have been quite conservative and have vigorously defended by their subsistence lifeway. I had accepted their statements but could not see any deeper -- tripped up by complexity again -- and the difference between expressed values versus more fundamental values. Again in this case, there has been much change, but not at all as I predicted.

A third example is the work I did in the Koyukuk river villages, where we can see an example of the reversibility of change. After I'd learned to stop predicting, I observed something that showed another dimension of cultural complexity. There was a disappearance of dog teams after snow machine introduced, then fish camps were mostly abandoned as well. Now all that we "know" says that's the end of two traditions. However there has been a resurgence of interest in dog teams, which has led to re-institution of summer fish camps. This has had far--reaching consequences for family life, educating children about life on the land, and so on.

A similar process happened with Wainwright fish camps - same process, but for different reasons. In 1964 there was almost no inland fishing: only two elders went to fish camp. It was a dying tradition. However, by 1981 fish camps had become a major summer/fall activity and there was small "village" of camps upriver. There were several reasons. First, transportation was a big factor, but there has also been resurgent interest in life-on-the-land. This is a case where there has been a mixture of rapid change in some aspects of culture, and a revitalization of aspects of tradition occurring at the same time. Again, culture and change are enormously complex. It is terribly easy to misinterpret what you see in the short run - or not to see enough to allow correct analysis. If we want to document and understand change, our research must embrace a vast array of variables and have means to cover relatively long spans of time.

I'd like to look briefly at some of the dimensions of cultural change in rural Alaskan communities to help us think about what needs to be documented.

Wainwright: 1964-1981. There have been visible, obvious changes in the village - housing, transportation, communication, economy, politics, and so on. All of these are obvious and easily documented, as in the MMS studies, but beyond this are there are other changes in the people themselves - the way they interact with each other (e.g. political and other conflicts), the values they hold (e.g.,. dancing), and the way they see the world (language, exposure to outside world, etc.). The difficulty is figuring out which dimensions of change are really meaningful to the Wainwright people as a cultural group. How do we decide whether the highly visible or the "invisible" changes should be studied? Do MMS studies really perceive the magnitude of cultural change?

Tenakee Springs: 1975-1982. There have been large changes in Tenakee due to timber harvesting. There is almost no physical change in the community from this cause -- virtually no observable change in most institutions, but the political, social and cultural effects were very great by local people's estimates. What I noted was the change in the "tone" or "flavor" of Tenakee life

after logging began - a tiny village grows, different kinds of people come in with . different values, people have more money - thousands of changes in minute aspects of daily life; the community becomes a different place. How do you document this?

One way to deal with this is to tap the local perspective. One way is to gain a deeper and longer-term perspective on change by intensive discussion with local people - bring the local perspective prominently into the work and combine it with the researcher's perspectives. Discover what changes are significant to local people and why. These are qualitative assessments -- but are they any less valuable and significant as indicators of change? Qualitative and quantitative approaches are not diametrically opposed -- even the most quantitative measures are eventually used and evaluated qualitatively. We must be wary of the illusion of precision in quantitative work -- like the football referee's judging placement of the ball, which is then precisely measured by the chain; and the significance of the fans is highly qualitative. I strongly advocate an equal balance between local people's assessments of change and those documented by researchers. Also, local people should monitor the monitoring research itself - review research material throughout the process to evaluate accuracy and provide input. We tried this committee approach on a Koyukuk film project, and it was very successful.

Lets take an example from our culture. Could we say that the most useful way to monitor change in the cultural institution of Christmas in our society is to count the number of people who celebrate it, the number of stores they visit each Christmas, the amount of money they spend on it, the extent to which governmental entities are involved with Christmas activities, the number of Christmas trees sold, the fluctuation of traffic volume during the Christmas holiday? If an anthropologist came here from New Guinea and used such statistical data as the baseline for studying change in our Christmas tradition - how much of the essence would he or she miss?

Much of culture is beyond measurement by quantitative means. Science -- in its quest for precise and verifiable data -- finds its focus on measurable quantities, but often because they are measurable rather than because they are demonstrably meaningful. We have to ask: to what extent are MMS studies influenced toward assessing the measurable for the sake of measurability?

The goal of replicability over time is a desirable one; but again, are we choosing protocols because they are subject to repeated measurement rather than because they have meaning in the assessment of cultural change?

I would strongly advocate a balance of qualitative ethnographic information and quantitative data, and would note that collecting such information takes time -- two weeks or a month in a community isn't enough. MMS might fruitfully try a longer-term study with this balance -- for baseline information. As it stands now, I'm not sure the data will serve the MMS's own purposes.

F. Larry Leistritz: Presentation of an Invited Paper

The next paper, entitled "Monitoring Socioeconomic Impacts of Large Scale Resource Development: A Review of Recent Experience in Relation to Monitoring Sociocultural Change in Rural Alaska," was delivered by F. Larry Leistritz. Larry is a Professor of Agricultural Economics, author of Socioeconomic Impact of Resource Development: Methods of Assessment, co-author of Energy Development in the Western United States: Impacts on Rural Areas, Environmental Impact of Growth, and Socioeconomic Impact Management: Design and Implementation.

Leistritz's session addressed both methodological issues and policy issues, He discussed the methodological problems involved in identifying, quantifying and analyzing socioeconomic indicators. Which variables, selected from the established literature, have proven to be the most sensitive indicators of socioeconomic or institutional change? Which variables have proved to be too inclusive, too time consuming or too costly to utilize effectively in a monitoring program? By what criteria are socioeconomic indicators to be evaluated? Which indicators fit these criteria in the economic, fiscal, and demographic spheres? Larry's policy concerns focussed on the importance of clarifying the ultimate objectives of the program, how best to translate these objectives into a monitoring program, and how these findings are to be translated into mitigative action.

Leistritz: Having examined the features of monitoring systems that have been implemented in connection with a variety of large-scale development projects, attention is now focused on the socioeconomic and sociocultural monitoring needs of the Minerals Management Service. In this section, criteria for selecting socioeconomic indicators are examined, and initial recommendations concerning economic, demographic, and fiscal indicators to be included in the MMS monitoring system are presented. It must be recognized, of course, that very general recommendations can be only be further refined as more information becomes available concerning (1) specific MMS goals and objectives for monitoring and (2) data availability.

In selecting indicators for use in a sociocultural monitoring system, a number of criteria are obviously relevant. We suggest that four criteria-are particularly important in selecting such indicators:

1. conceptual significance
2. sensitivity or precision
3. policy relevance
4. pragmatic considerations

Conceptual significance refers to the centrality of variable within a relevant theoretical framework explaining the processes of sociocultural change. For example, in the economic realm basic employment (i.e., employment in activities which produce goods or services for sale outside the area) is an important indicator to monitor because economic base theory (upon which most models of change in local economic activity are based) specifies a strong and consistent relationship between the level of basic economic activity in an area and the level of nonbasic (local trade and service) activity. If the monitoring system reveals substantial changes in basic economic activity, then researchers should be alerted to the probability of associated changes in nonbasic activity as

well as in other indicators which are often affected by the overall level of economic activity (such as tax revenues).

The criterion of sensitivity or precision has two important dimensions. The first is the responsiveness of the indicators to underlying changes. To measure business activity, for instance, sales are typically a more sensitive indicator of local businesses' fortunes than employment. Particularly in the relatively small retail and service businesses typical of rural areas, the number of employees may remain nearly constant over a relatively wide range in sales volume. The second dimension of the sensitivity criterion is timeliness. Again the choice between sales and employment is illustrative; employment often does not respond rapidly to changes in sales volume. Rather substantial lags in employment response often are observed, particularly in small business establishments.

The third criterion, policy relevance, refers to a variable's significance in measuring the degree of achievement of policy goals or utility in suggesting appropriate policy responses. For example, because enhanced job opportunities for area residents is often a major goal of local leaders, the number and type of new job opportunities associated with a development project and the extent of which local residents will have access to these jobs are often major issues. Monitoring the direct and indirect employment changes associated with a project, then, is often accorded high priority from a policy perspective. This example also illustrates the fact that an indicator may be ranked quite highly based on one criterion while scoring less well with respect to others. In selecting variables to include in a monitoring system, then, compromise is often necessary.

The final criterion recognized that some consideration must be given to data availability and the costs associated with measuring certain types of indicators. Some types of data may be "nice to have," but the costs associated with their collection may be prohibitive. Thus, considerable emphasis may need to be placed on identifying indicators which can be monitored without great expense but which meet the criteria of conceptual significance, sensitivity/precision, and policy relevance discussed above.

When attention is focussed on specific indicators that might be selected to measure economic change, it becomes obvious that two important information sources exist. Some types of information can be most readily (and accurately) obtained from the firms or other entities engaged in resource development activities while other types of data are most logically obtained from state agencies or community sources. The experience of previous monitoring efforts would seem to support the importance of both sources. Also, obtaining information from both developer and community sources allows for an opportunity for verification of data and generally for a triangulation of impact estimates. Accordingly, in the discussion which follows it is assumed that both developer and community sources will be used.

Development firms are best able to provide information concerning those aspects of resource development activities which tend to generate local impacts. From their records, key development firms should be able to furnish reliable information regarding their employment in connection with specific projects, the distribution of employment by type (i.e., local hires, non-local commuters, non-local relocates), and the nature and magnitude of their expenditures to local entities. Representatives of the development firms also should be able to provide valuable insights concerning their workforce and expenditure policies and the

extent to which these emphasize integration with (vs. isolation from) the local economy/community.

Community and state entities will be the appropriate sources for a number of types of information. Some types of information which would clearly be desirable to obtain on a regular basis include employment by type (e.g., fishing, petroleum-related, local trade and service), total sales by class of establishment, unemployment rates, and level and distribution of income. It appears likely that some of these data can be drawn from secondary sources, supplemented with locally derived information to valid in interpretation, while other types of information will only be available from local sources. Secondary sources of information must be scrutinized closely, however, to assure their relevance in the rural Alaska setting. In some cases, the data collection/reporting region may be so extensive that a particular data set has only limited relevance in measuring changes in socioeconomic conditions at the local level. In other cases, it is critical to know how specific data series are defined and collected (i.e., are seasonal fishing workers included?) in order to make accurate interpretations from the data.

Suggested economic indicators for consideration include the following:

Indicators	Suggested source
Petroleum-related employment by type of job {onshore vs. offshore) and worker residence status	Development firms
Petroleum-related expenditures	Development firms
Total sales of local firms, by type	State revenue department Local informants
Total employment by type (petroleum, fishing, local trade and service)	State employment service Local informants
Unemployment rates	State employment service Local informants
Income and income distribution	Bureau of the Census Bureau of Economic Analysis Local informants

As with economic indicators, information for demographic indicators can be drawn both from developers and from state and community sources. The comments concerning advantages of using both sources as well as the need to carefully examine the procedures used in developing certain data series also apply here as well. Development firms would seem to be a valuable source for information concerning their workers' demographic characteristics. Hopefully, the firms' employment records will contain information about workers' age, marital status, number of dependents, and similar characteristics. These firms could also provide

information on employee turnover. Key indicator data to be obtained from "state and community sources include total population (most recent estimate) of each community, number of new housing units built since 1980 (by year built), school enrollment and dropout rate, and number of births and deaths by year.

Fiscal indicators are again drawn from both company and community sources. Companies could be queried concerning tax or other payments they have made to local governments or other service provision agencies (e.g., taxes on shore base facilities). Community sources should be questioned regarding:

1. specific costs involved in servicing petroleum facilities (e.g., utility service for a shore base),
2. changes in (effective) local tax rates,
3. changes in numbers of local government employees,
4. changes in service structures (e.g., shift from volunteer fire department to paid firemen), and
5. changes in bonded indebtedness.

Summary: This paper has examined the important role of monitoring within the impact management framework. Monitoring can be valuable in identifying emerging problems and evaluating the effectiveness of planning processes. Several monitoring systems that have been implemented in connection with previous projects are reviewed in the paper that I have provided and evaluated for the purpose of proposing guidelines for the design and implementation of a monitoring system.

Discussion: The goals of the monitoring effort sometimes differ considerably. On the one hand, we need to increase basic knowledge so that we will know better in the future about the impacts of these projects and how to manage them. We are not really concerned that this would be immediately useful for local planning, or management, but we think by gathering information on impacts over the course of the project, we will be better informed, better equipped, and generally smarter for the next generation. While this is our basic goal, on the other hand we have to be sensitive to local planning needs as well.

A predominate objective has been very immediate information for either the company or community in terms of impact management and local planning. Emphasis has been placed on very frequent monitoring of these key variables and some kind of system for feeding back this information to the interested decision-maker.

Comment: One thing about just looking at the goals. Beyond the way that one figures one's monitoring efforts, such as the selection of the kind of indicators one monitors, the frequency of monitoring, the way you might design your monitoring, and so on, you have to ask the question of which communities to monitor. Do you focus on communities that are impacted, or, if we are after the basic research, as has been suggested, do we have to focus on non-impacted communities as well, along with regions?

Comment: We need to closely examine our criteria for selecting indicators. We need to look at the criteria of conceptual significance in a relevant framework. An example is the indicator of basic employment or basic income which is a very central concept or indicator within a larger framework of an overarching economic indicator. That tends to be the framework to assess local economic impact. We might look at alternative measures of basic economic activity

as a very good indicator of what is going to happen. Employment in many settings is an important factor, and jobs for local residents are seen as a major channel that benefits come to a community. Measuring employment by the status of the " employed then is useful; that is you need to understand if they are long-term local residents, relocated people, or commuters. As workers relocate in the community they bring their families with them, you see an increase in the local population, an increase in demand for services, and so on. It is very important to monitor employment to find out weather we have workers relocating in a community, and if they are bringing their families and school age children with them.

You can see there are a lot of trade-offs among the criteria. Some of these are primary data availability, costs, availability of secondary sources, and the reliability or the usefulness of the data obtained from secondary sources versus the cost of obtaining it from primary sources. There are some questions that are easier to answer than others. You have to think about how difficult it is going to be to get the information, and you have to worry, to some extent anyway, about bias. Indicators depend in part on the objectives you are after.

Freudenburg: What do you do about those economic functions that are not transacted in cash and for which no one has ever collected data? Take a subsistence example. When you collect data, won't there be fear that economic base may be threatened, and this will bias the data you collect? Second is the problem of how do you put a dollar amount on those transactions if you wish to use an economic framework. You need to figure out the value. You need to figure out what is happening with the level of activity and the level of effort, and you need some means for assessing your success and quality of information.

The economic base theory argues that the community has to do two things economically. One is bring in money from the outside and the other is to sell things to each other. One is called the basic sector and the other the service sector. The problem with a lot of communities, especially in Alaska, is that they don't have a basic sector. I consider it a transfer sector rather than a industry selling something to the outside world. A way of getting money from outside is through government jobs supported by taxpayers money from other places. That is a way to get money into a community in the first place. It has all kinds of problems. The other source of outside income is nature, subsistence fishing, hunting, and those don't fit neatly in the models either.

Alien: It seems that we would have the power to obtain the employment figures and similar data from industry through our permitting powers. We don't use are existing permitting authority as the means of obtaining information from industry, but it certainly seems to me we can.

Comment: There is a danger in trying to monitor every possible indicator. There is a definited need to be selective. What we need is a do-able set of indicators that will allow us to define major kinds of changes and still enable us to analyze data for reporting.

The economic function means different things at different levels of development. The household is not an independent economic unit in a subsistence economy. It is integrated with all the other institutions of that level of societal development. When you have a developed market economy, the economic function tends to get differentiated. That is sort of what development means, and it does not have the same inter-institutional relation with family. In a true

subsistence economy you have a community without jobs. The idea of having a job or having to have a job is a modern idea. It's not what you have in a traditional economy. You have a livelihood, but that is not a job in the same sense that we enculturate into our kids, and that is the system that we are trying to model. We have. also have to monitor over and across different levels: local, regional and statewide levels. Notice, however, when you do that you are moving your frame of reference away from the subsistence sector. If I couldn't monitor anything else, I would want to know who is getting employment in the marketplace and monitor those wages in relation to the non-market sector.

William Freudenburg: Delivery of an Invited Paper

The next paper, entitled "Theoretical Antidotes to the Problem of Selecting Variables," was delivered by William **Freudenburg.** Bill is a member of the Minerals Management Service Scientific Advisory Committee, author of Public Reactions to Nuclear Power: Are There Critical Masses? and Paradoxes of Western Energy Development.

Freudenburg's session examined the methodological problem of what he calls the "richness-succinctness trade-of f." He asks the question: to what extent are we willing to exchange richness of ethnographic detail for summarized data and analytic conclusions? He is also concerned with the problem of "representativeness." How do we avoid the sampling bias inherent in key informant (i.e., elite) data collection? He also addresses the problem of the use of protocols in general which he feels presume certain answers. He asks, "How can we design data collection instruments which avoid the inherent limitations of protocols yet assure that the research collects sufficient suitable information for the intended analysis?" Bill also led a discussion of the "available data" problem, or the tendency to collect and analyze information merely because it is available rather than because of its fit with the study objectives and asked "What important theoretical or logical concerns should orient the selection of variables and collection of field data?"

Freudenburg: I have a tendency to focus on paradoxes, questions that don't have easy answers. Any of you that have done much research have either seen are heard people talk in these terms. You have basic research at one end and applied research at the other end. In this room you have a similar situation between researchers and an agency.

It is the job of the agency, in general, to emphasize efficiency. "What we can get for the buck," whereas the researcher tends to emphasize the the richness the depth of understanding. One of the basic approaches of anthropology is get a sense of a culture as a whole. You get everything you can about a culture before it disappears. You have a conflict between the basic researcher perspective and the agency perspective. There is always a trade off between richness and efficiency. How do we deal with this problem? How do we get the important information? One of the things you have to do is decide what is important. If you can't study everything, you have to focus in on what is important and that requires you to decide what is important.

In basic research you have the O to 100 kind of scale, and **all** of us who are academics have seen studies that bought us nothing at the end. What is needed is stuff that is reasonably good basic research but very high on the applied continuum. You need to be drawing on some of the best theory in order to do basic good applied studies. The selection of variables is the key step. How is it that you decide what variables to use? There are about four basic approaches.

Basic approach number one is where you gather the data that is easiest to gather. This runs the risk of looking at what can be counted rather than at what counts. Approach number two is to look at what is politically hot. You can't afford to overlook that, but at the same time it can't be the only guideline. It may not capture what is **really** significant in the long run. The third approach is to draw on relevant theories. Expertise and experience are valuable. The fourth approach, which I think needs to be combined with the third

approach, is that you ask the locals themselves. In this case the expertise is lent to the process not only by the outside experts, but also by the lives of the people that you are studying. You need a combination of the views of those who really understand cultures and the views of local population which understands culture in a different way. You basically need to combine all four approaches.

There are additional considerations. Being on a sound theoretical basis is particularly important when you are doing comparative studies. There are a lot of similarities between rural sociological study communities that are integrated into American mainstream economic culture and the more isolated communities. In this comparison, and similar ones, you have some kind of idea about what is important to a culture. Second, you need to look at distributions as well as averages. A change in distributions may be significant in a culture that has always stressed egalitarian norms. Third, that distribution needs to be functional as well as statistical. You need to get the easy information, but you also need to know if people who depend on subsistence are some way being affected, negatively or positively.

Basically if you can describe a group in plain English in a way that will give you a general idea of what the central tendency of that group is, then it is group that you may want to know something about, and theories should tell you what groups are going to be affected more or less than others. Fourth, monitoring has to focus on understanding system properties and not just gathering data. You have to understand how the system works if you are going to be able to make any kind of prediction about how it will be affected by change.

The next thing you have to realize is that when drawing on the local expertise that I am talking about, when you ask people what is important to them you may often get statements about "where the shoe pinches." When we ask people what they value we tend to get two kinds of answers. One is a basic value that is challenged right now. It is important and on people's minds, and is mentioned immediately, but it can be due to temporary conditions. It is where the shoe is pinching now. The other type of value answer you get are the values that are stable over a long period of time. The problem with these is that people tend to not think about them much, until they are threatened. It's kind of like breathing: it is not on our minds as a terribly important thing until we can't do it. It may be fundamentally important, but people just don't walk around with it on their minds. You have to be careful about things like that, and that is where the outside researcher's perspective comes in handy.

A final consideration you still have to worry about is good solid methodology. The question I ask, given my bias and given these additional considerations, is what are the relevant theories? What are the theories about what it takes for a culture, a community, or a group of people to live and thrive? I look for basically two kinds of bottom lines. One is the notion of well-being and the quality of life. The second one is the ability of a group of people to assure continued survival in a way of life. I think we need theories that get at those two notions. Quality of life needs to be measured with subjective and objective measures. All of the objective measures in general tend to be shown by study of the empirical distribution of subjective notions of well-being. Most objective studies, however, don't directly consider the personal sense of competence or the kinds of interpersonal relationships, i.e., friends, family, co-workers, that are most significant to individuals when push comes to shove.

So what are the relevant theories, those that would allow us to get a

little closer to being comprehensive? We can't assume that some theory will tell us everything we need to know, but it will increase our confidence that we are getting the biggest portion of it. The economic base theory, the notion that you have to get the money into the community in the first place, and second keep it circulating around in the community to have some kind of economic well-being, is a valuable one. The whole notion of subsistence, which is a very important part of the economic base, has to be aligned with this theory. The other is the notion the necessity of a kind of export base other than what I call transfer payments. What can a community do to bring money in from the outside, which is something they will need to do if they want to continue to spend USA currency on products that they themselves desire? We need to know that.

In sociology, one notion is the ecological complex, which spans population, organization, environment and technology. This is a useful organizing principle. It's not theoretically derived, but it causes you to say have we thought about the ways in which the physical environment interacts with people's symbolic systems. The second major theory is the so-called social indicators. You need these as well as economic indicators. The third approach would be basic values theory. There are 18 universal values, though different people rate different values higher than others. There are nine primary values and nine instrumental values. There are a lot of interesting notions hidden away in that basic value scheme.

One of the essences of good field work is to see patterns in the wisdom that you receive from the people you are studying. It's them educating you on what is important. You need that education from a series of different cultures, then it becomes possible for a person to add a comparative prospective, which is essential in this undertaking.

Comment: The North Slope taxed the oil companies and was able to go into this massive capital improvement program which produced jobs, and put cash into the economy. Then it ended, and you find a much higher level of economic dependency and no prospect of income. It is hard to integrate that with an economic model that includes subsistence. It is not something that could have been foreseen in long range projections.

Discussion: Protocols Adapted from Phase I to be used in Phase II

The next task of the workshop was a discussion of the revised protocols to be used in the Phase II study.

Petterson: I think what we need here is people to react to what they have heard here so far; to give their interpretation from what their experience shows, what they have heard in these meetings, what they have read pertaining to small communities and the kind of communities we are dealing with, and relate that to what' we are trying to do with the protocols. We need to get what people have as the most important issue in their mind, the most interesting issue, the most pertinent issue, the most useful issue, or question that should be asked or information that should be gained in the field.

Smythe: My appreciation of the issue did not come through in the monitoring methodology. Going there with a list of data, trying to find people to talk to, trying to find institutions, trying to find secondary data on these institutions, I didn't think too much about what I was trying to monitor out there. My basic issue that I thought about was is what is it going to take to keep that community there. I looked into one corner of it, and I needed to look into more than I was. I noticed that there a lot of factors affecting keeping a household there. There are a lot of issues like taxation, private loss, and so on. We need to summarize that and talk about fixed household expenditures. What is the level of fixed household expenditures? What are the economic facts of maintaining a household? The households there are interdependent upon each other. If you can compare these factors between communities that will be useful wherever you go, and I think this is a profound indicator.

Worl: I went to the field knowing exactly what it was, it was land. This was from my years of studying the North Slope. It is because man and wildlife resources and everything in my mind stems from the land. Values, interrelationships, and even the kinship system. Land is the orienting factor in it. You need to look at changes in land allocation and changes in perception of the land, and the continued assess to the land. Not only assess, but competition with, or use by, other people. They have to be assured of going out to the land, being able to take wildlife, spending enough time out there. Continued assess is the most important thing. I get the impression that it is continued assess to productive land, and that an underlying question for a lot of people is will the land continue to have the potential to enable the people to reap the wildlife resources they depend on. You need both to get to the land and to make sure the land and sea continue to be productive. They are worried about whales, fish, and caribou and access to the land and the sea.

Galginaitis: One thing I have gotten out of this is how people see modern verses tradition institutions. Talking about visible and less visible institutions, institutions that were introduced to the Alaskan communities are very visible because they are introduced. The ones that are more traditional are the ones that have become adapted to these introduced institutions so they are less visible. They are also less visable in part because of the researcher's cultural bias, and because they are not all that dramatic. One place that it is easy to see is in the operation of the schools because you have several different things going on. You have the school as the main employer in the community. It employes those brought in by the North Slope Borough and local residents, and it is the social center of Western culture. The school is also an after-hours social

center, and a recreational center. You have the school as a focal point of all sorts of practices that are going on, in non-Native regions as well as Native regions.

Nelson: I am struck by a Western focus, a focus on Western institutions. I think land is a powerful way of getting away from that, and fundamental to the way Native communities have operated. I'm not convinced that focus on institutions is enough for this kind of research. I think that because, not that the material on institutions is not interesting, but rather it doesn't allow the MMS to do the job that it is mandated to do. The question about these protocols is will they help to mitigate the effect of OCS development. If that is the goal, we have to face what is necessary to achieve it, and not emphasize measuring what is measurable, which is valuable in itself, but not unless it is substantiated with a whole body of other information. Will the MMS think the results of this work are important enough that they will affect decisions that are going to be made concerning communities and OCS activity? User need directed the MMS toward an institutional analysis, but not towards the receiving side, or the sending side, but toward the institution of MMS. What have been the changes in the utilization of land that are pertinent in measuring sociocultural change? This is a question that must be asked to derive the data which we feel is necessary. What is the nature of people's relationship to land and resources?

Leistritz: I think the thing we need to monitor is the level of expenditures, number of employees, number of people, process by which they were sent to the field, how they were housed, how they are paid, how they spend their income. Also the number of dependents, and the degree to which they are enclaved. One of the ways to get at that is to require annual summary from oil companies.

Knapp: I want to second what Larry Leistritz said. This is something you can kind of get for free. For any kind of monitoring this source of information gives you an indication of whether or not there is anything to monitor, whether there have been any boats ashore or not, and so on. Sometimes it is very hard to determine where the effects are coming from. There are several of these kinds of questions. I strongly recommend the following basic information on "direct impacts" be collected from lease-holders (i.e., oil companies) on a regular basis: number of people passing through communities, number of local people hired (including age, sex, and race), number of dollars expended in the community, and kinds of facilities built or used. As a general protocol question I think you should ask "What has been the most basic change in there life/culture/institutions" and let the people themselves identify the impacts.

Bennett-Walter: The housing category is a very useful one. In addition to the list you provided source of diet data and housing vacancy, in the case where there is plenty of space and where population has declined, are two indicators of economic conditions. This overlaps with kinship groups by looking at people who live next door to each other and who participates with whom in the same cultural activities, the overall population distribution, who is living where, who is doubled up and why, and so on.

Allen: The land is very important, because people have adapted to living on that land for centuries, but they still need a certain amount of income to survive in the villages. I would like to focus on rates of changes, and people's ability to keep up with expenses as they perceive them to be. Not expectations, but actualities. People's ability to produce income is limited, from a limited number of sources, like fishermen and price of fish, and so on. We

can figure out a range of incomes to the fisherman and we know the cost of living in a village. We need to see how the two are relating to one and other. You can get this information from secondary data. The question is of the rates of changes in terms of actual needs, economic utilization, how much can be or is being brought in to the village, and the cost of living in that community. I think what is crucial is their ability to meet perceived expenses. Expenses differ from place to place and you have to collect that information at the local level.

Downs: The perception of necessary expenses is an important thing to examine, because obviously what people feel is important varies a great deal from place to place, and therefore you have to collect that data on a local level.

Freudenburg: You have to keep separate what is here and what is not here. This set of protocols does a very good job on what it focusses on, but there are other things that it does not address that I think it should. The major problem in the Phase I protocol is what I call the taiI-waging-the-dog problem. That is, there is a focus on the data that are readily available. You need to look at the theories. Where do the theories tell us to look, and logically where would we see MMS-related impacts occurring? Native cultures that have survived have a great deal of institutionalized wisdom about survivability. They have survived because they have developed institutions of sharing and of mutual help. Those are cultural resources. Those patterns of sharing and support and mutual help are likely to continue to be very important in the long run -- not necessarily this year, or in five years when the OCS money runs out. What will they have to fall back on unless it is the traditional wisdom of cultural survival? We need to see that the long-term sustainability is maintained. What is most important to the long-term sustainability of this cultural and therefore these people? It is much more than money. Money is one of the problems because it going to come up and go down. What is it that continues on, what do you have afterwards, what carries on, what is it that assures the survivability of the culture? You shouldn't just look at the long-term survival, but the basic processes that operate this culture normally. What are the basic processes or factors that keep this culture alive?

Bennett-Walter: One of the things that we are having problems with here is that people are talking about different levels of impacts. Some people are talking in monumental terms, and it is difficult to get a feel for this level of impact. OCS is definable as being a relatively low-impact case, in relation to other federal projects in other parts of the country and in relation to other things that are happening in Alaska. Many of the questions that are being asked under this OCS monitoring are life and death sort of questions, and these may be inappropriate for the type of monitoring we are doing. We need to think about scale. I'm not saying that it won't be large scale, but we need to thing about issues of scale.

Freudenburg: Contrary to what I just said, we don't need to look at just issues of long-term survivability, we also need to look at what keeps this culture operating normally. It's kind of like biology. A smart biologist doesn't just count fish, he tries to figure out what is in the system that keeps the fish alive or dead. We need to look at basic cultural practices.

Allen: I would modify that point to include what keeps the culture alive in this place. The culture could survive through migration, or whatever, but the important thing about the issues of the land and the sea and all of that is the ability of the culture to survive in relation to those things.

Armstrong: One of the problems I have, when I sit down to write the social section of an EIS, is that when I read the sociocultural reports there are often sections on social impacts, but there is very little substance. For example on St. Paul, if you move 950 people in there in an enclave of workers, and that is a scenario, plus another 4,000 people passing through, it seems to me that you are going to have some kind of change in the cultural values. I don't know how you are going to get at this in a monitoring study, but it is not being done now.

King: 1'11 even take that a step further. All this is based on the assumption that those workers are going to be in an enclave. Is there going to be a fence with barbed wire on the top to prevent the intermixing of people? Or is there going to be some degree of contact? That is all an assumption, and that is a difficult thing to deal with.

Downs: The issue that I would address that under is the issue of local autonomy. Local autonomy in at least three different senses. When a new population moves in, do they move into the basic processes of the community? Do they alter the the political structure or the economic structure of the community, or is it more of an enclave where the existing community through the device of the local corporation, control of the land, or the local government with local zoning regulations manages to retain control over local institutions? Second, do they retain political autonomy on the local level, or are the communities and groups being incorporated into larger systems, such as community autonomy versus incorporation into a borough or retention of an IRA versus incorporation as a city with all the state relations that implies? A third sense would be the degree of commercial autonomy. Are there external commercial interests which dominate the economics of the community? In some communities experiencing change, the local economy is completely dominated by factors beyond the control of the people in the community. All of these issues come together under the heading of local autonomy.

Petterson: You can see all of those different sorts of things happening in different communities. You have the Valdez model and the Cold Bay model. In Valdez outsiders came in and became voters and took control of the community overnight. In Cold Bay, they anticipated that there would be change in their area, and they were astute enough to channel the change the way that they wanted it to go, for the most part. In Unalaska you have an oil enclave outside of the community. With Nuiqsut you have an enclave community outside of a massive oil development. We need to look at the context and the relationship between the two kinds of developments. We need to look at the political developments that have taken place as a result of the interaction of the oil development and the people. Linearization is the process that we need to look at and to look for the emergence of regional level entities.

Gibson: I think you need to look at the means by which people attempt to deal with social disruption. We should somewhere look at social control, or stress indicators to deal with increased social disruption. Both the disruption and the control. We need to look at social stress and the means of coping with stress, that is, we need to examine coping mechanisms.

Freudenburg: Linearization is a means of coping with stress, but that isn't the main point I want to make. I think in this study if you are going to do your job you have to take advantage of the "two heads are better than one" phenomenon. You have to realize we sociologists will see the world through the blinders we have been trained to wear, and anthropologists will have a different

set of blinders, and you are likely, almost guaranteed, to highlight different kinds of things.

Bennett-Walter: One type of study that we haven't talked about at all is an industry monitoring study. Industry monitoring studies talk in terms of the number of rigs, boats and the number of people on those boats. It may be useful to take a little bit of that information and build it into our analysis and put it forward in sociocultural monitoring. I am not saying duplicate it, but reinterpret the information.

Smythe: Why not ask what has been the most basic change in their life and cultural institutions and let the people identify these basic cultural processes.

Freudenburg: We need to look at basic cultural processes as identified by resent threats there too. We need to look at their coping mechanisms. Lifestyle change, perceived change, and ways of life.

King: I guess the thing that always bothered me with my economic background is the issue of thresholds. Two years ago we were perceived as bad in the Bering Sea because the crab fisheries were fine, and now all of a sudden we are perceived as God's gift to man, providing employment. If bottomfishing comes up we are going to be perceived as bad, but if it doesn't come up high enough we aren't. If we put in too big of an enclave, we are bad again. It's almost like thresholds. Where are these thresholds?

Petterson: It never has come up in the field like that because it has never been on the margin, and it has never been a marginal question. The example you used of the crab boom: it was such a dramatic boom and bust that everyone perceived it in pretty much the same way.

King: Well an opposite of that is that they are able to handle the boom of the crab fisheries, and the bottomfisheries, and the gold or whatever, as part of the normal cycle. Are we doing anything outside of the normal cycle?

Downs: I would like to respond to that. When you say they handled it, I don't know if that is the correct word. I think it is more like they survived it, mostly, and- I don't think that at the local level they perceive that as part of the normal cycle in the least. In the historical perspective I think we can say that it is a normal cycle, because it is normative, that's what happens, but for the individuals living through that, I don't think they have the same perspective. As far as the threshold phenomenon, that is what I addressed, or was attempting to address, in my talk yesterday on the need to contextualized changes. You need to understand the background, because the exact same stimuli in two different contexts can produce two widely different responses, as you have noted. I don't know how to address that other than to say you need to keep your finger on the pulse of the community, and you really can't anticipate future events. Yesterday I guessed the crab was down to 10% of the peak years. I saw in the paper this morning it is now down to 5%. Nobody could have guessed that back then. You have to design a program flexible enough to keep your finger on the pulse of the community to figure out those changes and add in factors that become profound.

Imm: However, if you are in an agency that is responsible for mitigation measures, and all of a sudden you get a complex mitigation plan

together, and try to anticipate all possible outcomes, then it is difficult. They would like you to be more precise, to allow them to be more precise with their mitigation measures.

Freudenburg: One of the things you may end up doing is mitigating the uncertainty of your projections, as well as mitigating specific projections.

King: An example would be if you wanted to mitigate increased employment. You can handle that different ways at different levels, but it is tough to put that in the lease.

Leistritz: The reaction to OCS out in the Aleutians is not all that cliff erent than the reaction we saw in the northern plains to energy development 10 years ago and today. Back then you saw strong opposition to non-agricultural development. Today people would take a coal mine in their front yard.

Petterson: What you are talking about is anticipatory mitigation, and that seems a little crazy to me. That is not usually how we think of mitigation. In the monitoring effort, we can tell you the effects that are happening, and that is when the mitigation can reasonably, or effectively, be done.

King: I appreciate what you are saying, however if you tell us that "it is ok to go out there, we don't think there is any problem, go out there to St. Paul and build whatever you want," and then you start monitoring and halfway in, you tell us "whoops, damn you should have done that in an enclave...", well, you just can't do that. The only time we have any control is before the lease process. That is the only time you can put in stipulations or mitigating measures. These are the only things that I can enforce. You can't go to Shell and say, well let's sit down and renegotiate this lease. These are the things that we are dealing with in reality. You can't go back and change the lease because of what you found out in the monitoring program.

Freudenburg: What you need to give the oil companies is the worst-case scenario. Give them a lot of restrictions that you say you might relax with further research, and that will give them the incentive to go out and fund some quality research of their own.

Allen: On the subsistence issue, one of the problems is that most of the subsistence hunting and fishing does not occur in federal waters. The only one that I can think of that does is walrus hunting. Once you issue the lease you also issue the right to go out to explore and develop under certain conditions. We specify the conditions, but we don't do all that we probably could.

Freudenburg: A lot of the OCS activity does take place on land. There is ample precedent to look at the onshore impact of offshore activities. In a lease there should be stipulations to conduct impact monitoring.

Downs: One of the big differences between the Canadian environmental monitoring system and ours is that ours seems to have a built-in failure when it comes to mitigation measures. We have to design mitigation measures and put them in the lease long before there is production and long before there are any effects, and you can't know the context within which those effects will take place. These communities, especially single resource-dependent communities, are unstable over the long term. It doesn't seem reasonable to try and precisely anticipate effects years in advance. It is not possible.

Alien: The other power we have is in the permitting process. I would venture to say that we would be able to put stipulations in the permits. For example we could say that five years down the road they would have to conduct monitoring on their actions.

King: The problem with that is that these permits you are talking about are pre-lease sale permits. Once that lease has been sold, they have a license to operate, to explore and develop restricted only by the conditions of the lease, and you better specify those conditions well. Another problem you've got is what's happening in the Beaufort. We're going into our fourth lease sale up there, and the expiration just occurred on our first lease sale. It is very hard, even though we are monitoring, to know what stipulations I should put on these new lease sales.

Allen: The other government responsibility of concern , which is just being worked out in the courts, is section 810 which deals with subsistence solely. The government is asked to come up with the measures by which it going to mitigate impacts on subsistence. There is going to be a time when someone is going to have to identify the impact of OCS on subsistence. It is very difficult to argue a case on the effect on subsistence.

Petterson: That is going to be a difficult one, because I certainly can see where it can be argued that having 950 OCS people on St. Paul, them just being there, will certainly have an effect on subsistence.

Allen: I just got through writing that section, and it is very difficult to argue a case for effects on subsistence harvest. At least for the harvest itself, Now, there could be oil spill effects, but in terms of competition with other people, forget it. Why? Because the type of resources out there are not the kind that outsiders use, in terms of fish, of mammals, and perhaps even in terms of migratory birds. The effects of oil and noise, etc., on critters is a biological evaluation. I take the biologists word on that. I also crank in the organizational aspect, biologists don't do that. On sale 70 I said even if there weren't an oil spill, or even if there weren't an effect on the fur seals if there were a spill, conceivably the North Pacific Council on Fur Seals could ask that no harvest take place at all just to see whether or not they could possibly be effected, and that is an organizational phenomenon, not derived from biological factors at all.

Work How are you going to monitor health and education and their relationship or their dependence on outside institutions? Obviously, in the Aleutians they don't have a borough down there. The kinds of changes that are going on right now in health care and educational systems will impact that region much more than other regions, because of the cut in federal dollars. Health care is decreased through a cut in funds and federal dollars for education are decreasing. I suspect in the next legislature that the state will also reduce the funds that go to this region and the region is really dependent on state dollars. How are you going to look at that? I am also aware that in this region there are a lot, or there seem to be a lot, of students that leave the area to attend school outside the area, in Anchorage, Mt. Edgecombe, etc. How are you going to look at that?

Downs: For the region the school data records are quite comprehensive. The regional REAA has data on all the schools on the Chain, with the exception of

Unalaska, which because of its status as a first class city maintains its own school system and has its own records. There are also REAA records for the Pribilofs as well. A way to supplement that, of course, is to talk to the superintendents of the various schools in each community and also the school board about their goals, and how these have been going, and so on. The JOM funds and the bilingual education is mainly handled by corporations. In terms of the health care there are good local clinic records.

Petterson: The question that I thought I heard Rosita ask is this: First, how are we going to address the changes in economic subsidies, such as the analysis of the changes on St. Paul. Second, what are you going to do about the health indices, and how are you going to monitor the economic support for health, and the changes of the health industry? That isn't an easy question to answer, but it is one that has to be thought about.

Worl: I think the thing that is important to track in this case is the changes in the outside dollars coming into the system. Their funding is going to decrease, and I think the percentage of students coming into Anchorage is going to increase.

Petterson: That is not only true in the health and education area, it is also true for the political subsidies and direct economic subsidies for gasoline, etc.

Leistritz: As a follow-up to Downs' question I would like to know what are the responsibilities of the government to mitigate impacts several years down the road?

Downs: What are your rights and responsibilities as a government entity to go in there and make adjustments to the local economy?

King: It is our obligation that if we see something that is going to make us responsible for some things later on, it is our job to point that out to the Secretary at the time he is making the decision to lease or not to lease. Once you have held the lease sale you are in a different ballgame. You are then talking about Congress coming in with special funding, or something like that.

Downs: To concretize this, lets say x number of workers are going to be living in an enclave close to a city, however, they are going to be utilizing city water sources, using city power, using city road system, and all of those thing are not going to be able to bear the additional burden without capital improvements. Now is it the responsibility of the city, which makes very little if any money off of the enclave, or the responsibility of the feds, because it is a federal action which generated the work, to compensate that city for the additional burden on their infrastructure?

King: We would point out the possibility of significant impacts to the Secretary during the lease sale decision period, but I think it would take special legislation to mitigate something like that.

Leistritz: One way to handle this is with monitoring and arbitration agreements. Just as a general planning principle it makes more sense to come up with how you are going to deal with the problems that you don't anticipate than to try to anticipate every single one of them. You have mechanisms to decide how you are settle a problem when it arises.

P. Wolf: Chairman's Summary Remarks

In the final session C.P. Wolf addressed issues of methodology, theory, and policy relevant to the project. The session opened by addressing the pragmatic and methodological problems inherent in rapid rural assessment, and in reconciling etic and emit interpretations of sociocultural change.

He addressed two important theoretical questions: first, "Upon what theoretical grounds do we base our calibration of assessment methodologies?" and second, "How do we accommodate cultural variability in the selection of appropriate monitoring methodologies?" That is, how do we go about creating a culturally sensitive measuring system that will allow testing of impact hypotheses?

Finally, the session was organized with the explicit intent of resolving some of the immediate and significant methodological, theoretical and pragmatic issues involved in the design and implementation of a sociocultural monitoring methodology. The title of Wolf's talk was "Policy, Theory and Methodology in Monitoring Sociocultural Change."

Wolf: We need to develop a model which is a network of impact or influences, causes and effects. This is where you start to test your knowledge of the systematic relation of causes and effects. This matrix methodology then evolves into a modeling approach. That is what I think you are trying to evolve here in the way of a monitoring system.

This a summary view. We have policy, why are we doing this thing, because of need. The theory is what to do, what to think. The methodology should indicate how to do it. The monitoring is the context. When you are talking about sociocultural change you are getting into the substance of our lives and the lives of society and how that is getting messed up and what we should think about that.

We don't do policy, that is done in Congress. We just carry it out. That is true, but there is discretionary power in interpreting and administering the law which amounts to a form of power. There is an apparent discrepancy between theory, methodology and policy. Those things take place in isolation from one another, the way we normally do it, but this does not have to be the case. For example, take policy and theory. The way policy is formulated doesn't seem to map very well on how we think about our own society, or the relationship between our society and another society. How do we get these monitoring categories? We get them from the theory on how societies operate and how they are impacted. That should be the systematic basis for generating impact categories, some kind of theory of sociocultural change.

People have developed something like twelve varieties of sociocultural change. No theory has ever been developed for social impact assessment, however. This means, in effect, wasting an intellectual resource. It is not as bad with economic impact assessment. One of the things that has happened in the field is the development of influence on the back end. The mitigation, monitoring and management. We are paying attention to a full assessment cycle. You see the relationship of the monitoring steps to the other steps in this series.

The thing you monitor is the set of impact categories that you profile

and then project with and without the development project. That is what you monitor, that is what your mitigate. That and nothing but that. There are four different areas of field development that need attention. Theoretical, methodological, institutional and professional. They all interrelate. Theory development, methodological development, institutional development and professional development all need to converge. We have a mess of specific instances and issues. Another exercise we could try is to see where we came out on these issues, in fact how these issues interrelate.

What basis do we have to make a prediction? The current economic conditions of the community, but this has not been systematically developed. If we think of this as one more step in continuing exercise and if there is enough institutional continuity, if its own agency environment is able to accommodate itself, to move in other directions, then I feel that there is a good possibility for developing a viable monitoring institution based on this work.

That is only one part of the institutional system, and that part is a leading part, but it should not dominate the system. The professionals need to come together as a community. How can we draw on the accumulated wisdom and theories in the social sciences to direct the methods we use to serve the policy end? What can we say about the persistence and the well-being of cultures that can tell us what we should be monitoring most of all? How things could be changed by OCS development? There needs to be more emphasis on integration and balance between the expert and public, the inside and the outside, and different classes of impact variables like economics and sociocultural. Balancing the institutional system between the local, the regional, the federal, and the international levels. I think there is balance required between policy, program and project levels of assessment. We have not paid enough attention to the policy level. It is not something they just do in Washington and then you carry out. We are not using what we know very effectively.

Where do you go from here in developing this monitoring system operation? I would think about doing some pilot testing before I got very deep into data collection. I would do a 'once through,' I think, of a total system, as complete a system as possible with the illustrative data rather than systematic data. Systematic data collection would come in the second stage.

I think the way that this should go is in the way of community monitoring, that somehow the people who are the most at risk, the potentially most effected, have got to have control over their conditions of existence. They have to have some power. So far the MMS has been acting as a kind of proxy for them in upholding a generous definition of the public interest that does not reduce it to parochial agency. I give them full marks for good intentions. At the same time I'm concerned about the lead quality of the agency, the point at which institutional leadership hasn't been too dominant or out of balance. The communities have to become involved more and there are various federal mandates out for public participation.

All of these reduce to the question of what is meaningful. Meaningful public participation is power sharing. That is a threat to the agency because to what extent can they let in the public and divide the power with the public without abdicating the agency mission? This is a institutional problem.

I am pretty sure the community has the capability to monitor in a cost-effective way, in an extremely cultural/environmentally sensitive way, and in a

politically acceptable way. We have got to exercise this power or acquire the ability to get it together institutionally so this can operate. The condition of that is that at some point the community has the power of veto over what is happening today. I don't think that is so bad.

Discussion on oil: To whom is the community responsible? One answer is to itself. Another side of this answer is to the future generation. Another answer is to higher authority, both. state and federal. Of course, there is no one good answer. We have to deal with some ethical issues as well. Is anyone in this world entitled to a privileged lifestyle? Is anyone really entitled to a choice of occupation or cultural independence without restraint? There is always going to be cultural adjustment. To keep the model you not only try to foresee impacts but try to mitigate them. Our policy, nationally, has been uniformitarian. One size fits all. The idea is that to do social justice is to treat everybody the same. That kind of a policy stance is likely to be culturally insensitive or not adapted to the cultural diversity of different regions and situations. It is up to the agency to make that adjustment to try to develop that sensitivity whereby the definition of justice is treating equals as equals and things that are unequal as being unequal, and not to try to treat everybody the same.

Outline of Workshop Research Suggestions

The following is an outline presentation of the topics discussed above and identified by the participants for addition to field data collection protocols and for use in the institutional analysis of the Aleutian-Pribilof region.

- community viability - fixed household expenses
- land (& sea) - continued access (wildlife resources)
- community adaptive institution - schools
- relation to resources
- activity analysis ("sending" side) (e.g. employment)
- housing/crowding
- income sources (amounts) and requirements of change
- adaptive strategy
  - social support (helping/sharing)
  - indigenous knowledge/value systems
- cultural values
- local autonomy (economic/political)
- perceived change
- thresholds
- flexibility
- coping mechanisms/social control

APPENDIX "A"

SUMMARY: NUIOSUT FIELD INVESTIGATION. NOVEMBER 1985

SOCIOCULTURAL MONITORING METHODOLOGY WORKSHOPS

Conducted for

THE U.S. DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

at

THE SHERATON HOTEL

ANCHORAGE, ALASKA

DECEMBER 16-17, 1985

by

IMPACT ASSESSMENT, INC.

APPENDIX A

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Summary: **Nuiqsut** Field Investigation, November 1985

Population

Demographic information, systematically collected in a time series, can produce some of the most revealing indicators of social change. The demographic dynamics of a community are a fundamental element of all social activity. Social organization does not reduce to demographics, but it is certainly constrained by them. The situation in Nuiqsut can be examined by comparing the censuses available from November 1982 and November 1985.

Certain limitations on this information must be explained. Neither document is a door-to-door census. Both were constructed through the use of informants to modify an already existing document. Vital statistic records do not exist for the Nuiqsut population, so such things as birth and death rates can not be discussed with much accuracy. This is more often true than not for the communities of interest, however. Note that the census for November of each year is being used for comparison so as to minimize any seasonally related fluctuations.

The 1985 population pyramid for Nuiqsut (Figure 1) resembles that of 1982, as might be expected with only a three year interval between them. The non-Inupiat portion of the population has decreased somewhat (from 16.2% to 12.4%) and is still mostly transient in nature. The only permanent non-Inupiat residents in Nuiqsut a few non-Inupiat men married to Inupiat women.

The largest age group (20-24) is now producing children, as the broadening base of the pyramid would suggest. The severe constrictions evident in the 1982 pyramid have been moderated in 1985, possibly due to a narrow population age distribution and significant immigration. The largest cohort has moved "up" the pyramid as would be expected. Males still outnumber females, but the sex ratio has declined to 113.8:100 (from 122.1:100). The dependency ratio (the ratio of dependents to potential producers) has increased to 59.4:100 (from 47.3:100), which is still relatively low but indicates that the village population is becoming younger. The child-woman ratio for the general Inupiat population ratio has increased dramatically to 74.3:100 (from 48.3:100, note the misplaced decimal point in The Nuiqsut Case Study). Both ratios indicate that population replacement is more than compensating for the aging of the present population. The younger cohorts are becoming larger proportional parts of the population (Table 1).

The total population of Nuiqsut has increased dramatically from 271 to 343 (an increase of seventy-two people or 26.7%). This increase, moreover, is nearly entirely Inupiat. Since November 1982, twenty-eight non-Inupiat have left Nuiqsut. In that same period, twenty-nine non-Inupiat have come to Nuiqsut. A minimum of fourteen Inupiat have died or left Nuiqsut since November 1982 (time did not allow for a detailed comparison of the censuses in this regard). This means that eighty-seven Inupiat now live in Nuiqsut who did not live there in 1982. Of these, twenty-five (29%) are two years old or less (born after the November 1982 census) and live with people who were in Nuiqsut in November 1982. This gives a reasonable approximation of the natural increase. This leaves sixty-two Inupiat to be accounted for by immigration. Six new households, totaling thirty-two individuals (37% of the 87), were formed in this way. It should be noted that the dependency ratio for the six households which immigrated to Nuiqsut as households have an aggregate dependency ratio of 70.6:100 and an aggregate child-woman ratio of 200.0:100. The remaining thirty individuals (34%) represent those who had some previous residential tie to Nuiqsut who either returned to

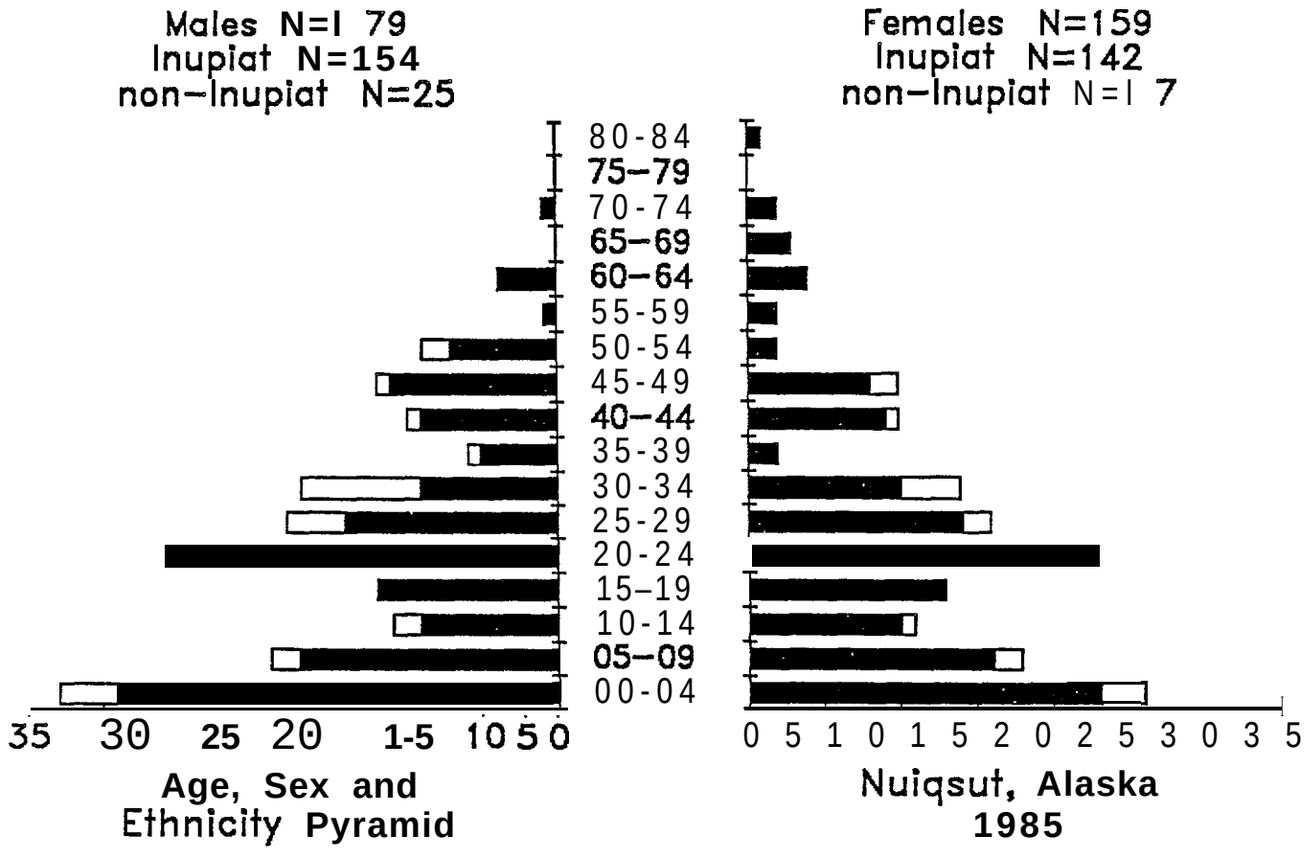
existing households or who combined with people already in Nuiqsut to form new households. This distinction is important in trying to determine the reasons for the population increase. The housing supply in Nuiqsut has recently increased by twenty-two units and so would be expected to attract new people to Nuiqsut. The six households (thirty-two people) and part of the "returning" thirty, but not all of them, would fit here. The natural increase of twenty-five and at least part of the thirty due to immigration would have occurred in any event. The six new households and part of the immigration was probably dependent on the availability of the new housing. It appears that Nuiqsut Inupiat women are more fertile than ever (the increasing child-woman ratio) but that this is at least partially offset by an influx of working-age people without children. These may well be individuals only loosely tied into a Nuiqsut household, or could represent the reconstitution of older families now that adequate (and larger) housing is available. It would appear, however, that the availability of housing itself was a significant cause of the significant net immigration. Since it is not expected that much new housing will be built in Nuiqsut in the near future, it may well be that the Nuiqsut population will become increasingly younger. This should be tempered somewhat because the cohorts now approaching reproductive age form the constriction at the base of the pyramid (Figure 1).

TABLE 1

INUPIAT POPULATION BREAKDOWN, NUIQSUT, ALASKA

	November 1982		November 1985	
AGE GROUP	N	%	N	%
00-04	29	12.8	52	17.6
05-10	20	8.8	33	11.1
11-14	17	7.5	19	6.4
14-19	44	19.4	25	8.4
20-24	25	11.0	49	16.6
25-29	15	6.6	28	9.5
30-34	14	6.2	19	6.4
35-39	12	5.3	7	2.4
40-44	19	8.4	18	6.1
45-49	10	4.4	19	6.4
50-54	4	1.8	9	3.0
55-59	6	2.6	3	1.0
60-64	4	1.8	8	2.7
65-69	5	2.2	3	1.0
70-74	2	0.9	1	0.3
75-79	1	0.4	0	0.0
80-84	0	0.0	1	0.3
TOTALS	227	100.1	296	100.0

FIGURE 1: AGE, SEX, AND **ETHNICITY** PYRAMID
NUIQSUT, ALASKA, NOVEMBER 1985



Household size in Nuiqsut has increased slightly statistically, but is subject to so many fluctuating variables that this is probably not significant. Average Inupiat household size is 4.6 (median 4, mode 4) while non-Inupiat households average 2.9 persons (median 3, mode 4). Three households with one non-Inupiat spouse are included with the "non-Inupiat" households, or the difference between Inupiat or non-Inupiat households would be even greater.

The distribution and range of Inupiat household sizes is about the same as for the 1982-83 research period (compare Figure 2 with pages 95-96 of The Nuiqsut Case Study). Large households exist, but they are for the most part the same large households which existed before. Newly formed Inupiat households in Nuiqsut are generally younger, and therefore smaller in size. Several are composed of a single elderly person with a younger relative. This shows up in the relatively equal levels of larger households for the two time periods as compared to the increased frequencies for households of size two and three for November 1985.

The spatial distribution of households throughout the village is a potential indicator of how relatively scarce resources are distributed. This will be discussed at greater length as an issue which illustrates political and social processes in Nuiqsut, but here it can be used to indicate certain social values. There are essentially four categories of housing in Nuiqsut. Three correspond to different periods of program-built housing (under the auspices of the Arctic Slope Regional Corporation followed by the North Slope Borough). The fourth is composed of owner-built and financed housing, and tends to be small and simple. Figure 3 plots these on a map of Nuiqsut. Group one was built as one-room structures with no extra amenities. There was no running water and heat was provided by a diesel oil space heater or a wood stove. Many of these structures have been modified by their inhabitants since they were built. Group two consists of much larger structures with internal partitions, running water, and a central heating system. They are much more expensive to maintain. Group three consists of structures similar to those of group two, but with a refined design, more insulation, and they are generally larger. The general community rating is that, other things considered equal, three is better than two, two is better than one, and one is better than four. The number of vacant units (Table 2) and the number of people actually living in each block of houses (Table 3) demonstrates this preference, as well as reflecting the supply/demand balance for housing in Nuiqsut (see pp 25-45 of The Nuiqsut Case Study for more detail).

Figures 4a-d indicate that households are not randomly distributed within the four housing groups. Non-Inupiat are concentrated in group two housing, which is mainly a result of group two being the first houses built by the North Slope Borough (NSB) and most non-Inupiat residents are NSB employees who are provided with housing. Group one housing is generally seen as inappropriate for this purpose. Those non-Inupiat living in group one housing are either transient workers or people with no formal connection to the NSB (with one exception, in an upgraded unit). Those non-Inupiat in other sorts of housing include one NSB employee in official NSB housing (group three) and the three households where non-Inupiat men have married Inupiat women arid are perceived as permanent Nuiqsut residents.

TABLE 2

HOUSING UNIT VACANCIES, BY HOUSING GROUP

	GROUP 1	GROUP 2	GROUP 3	GROUP 4	TOTAL
# UNITS	33	35	23	8	86
# VACANT	9	5	0	4	18
% VACANT	27.3	14.3	0.0	50.0	20.9

TABLE 3

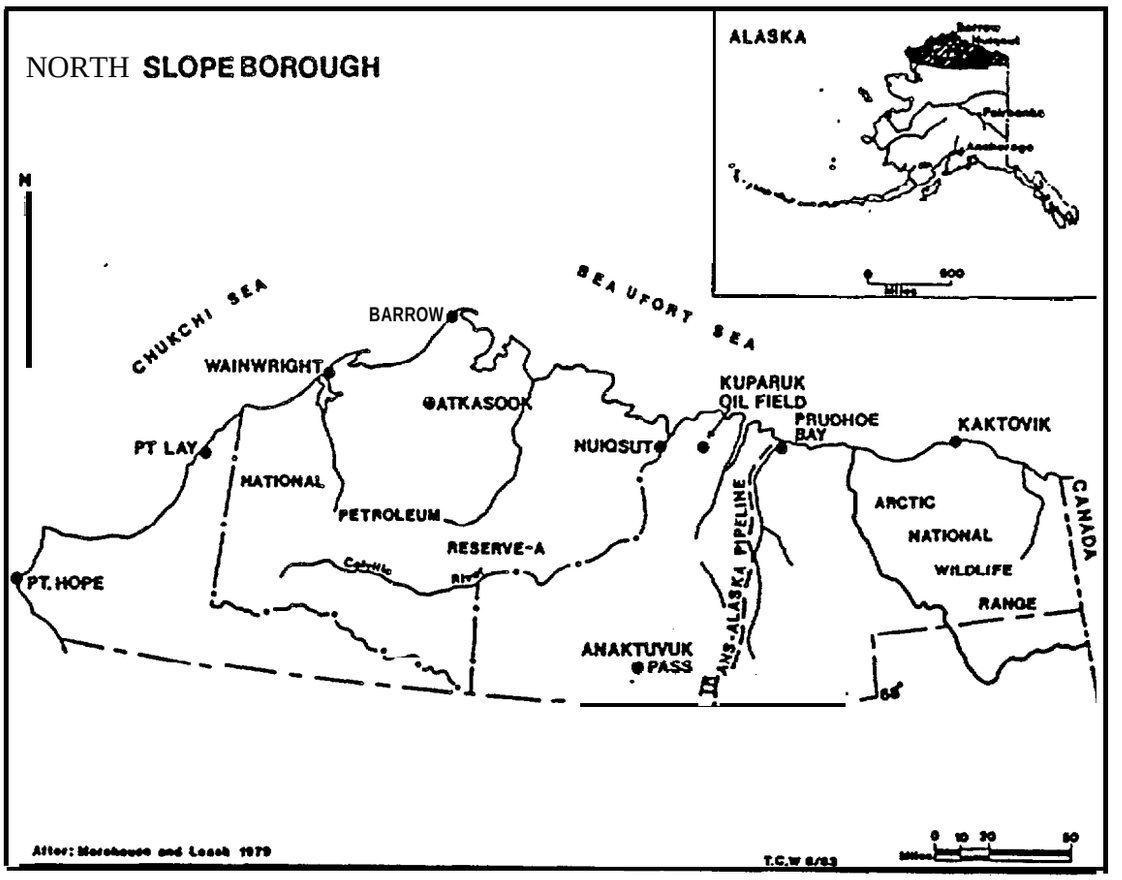
POPULATION BY CITY BLOCK, **NUIQSUT,** ALASKA (11/S5)

BLOCK	1	2	3	4	5	6	OTHER
POPULATION	31	47	59	98	7	90	6

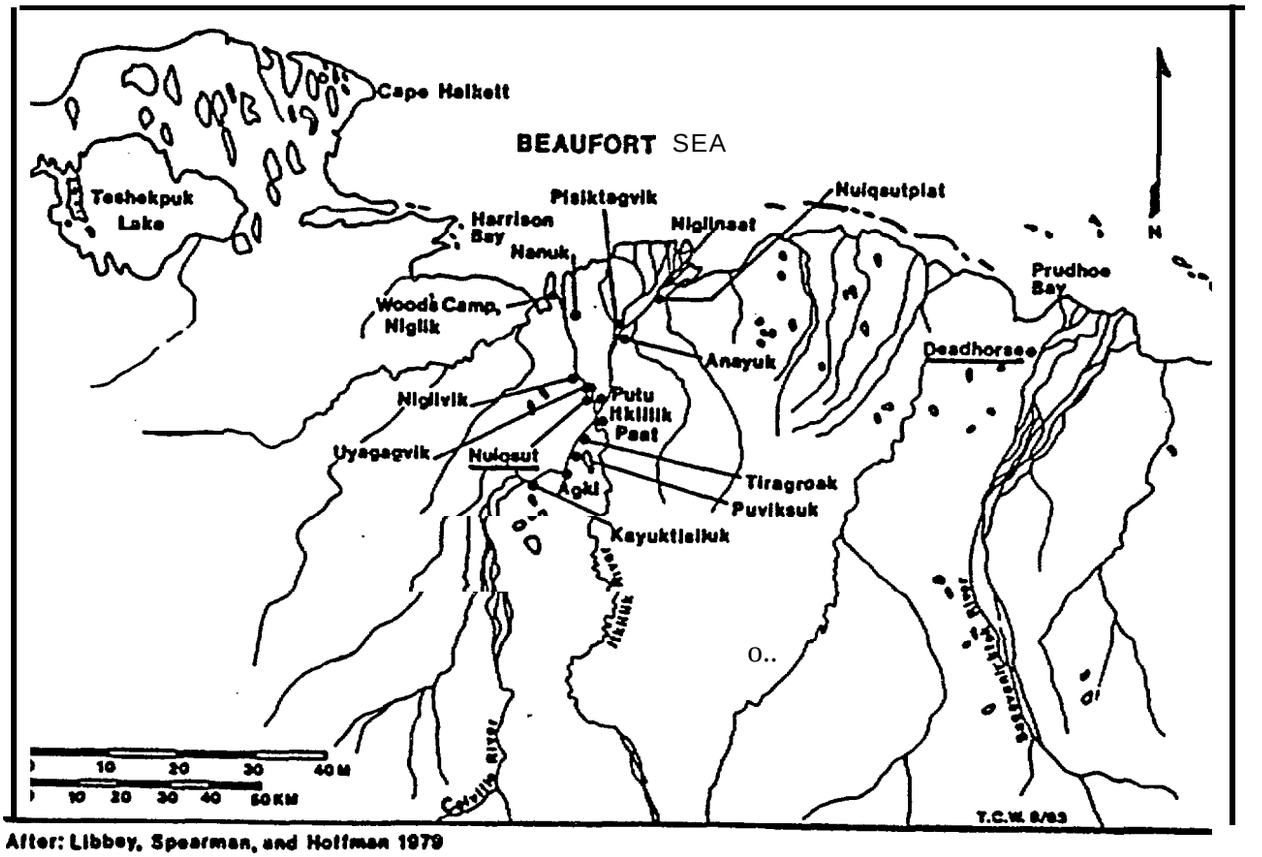
Large and middle-sized Inupiat households are distributed within all three of the larger structure categories. A discussion of why certain households are where they are is best deferred for now. The distribution of small Inupiat households can be fairly well explained, however. Single member households are almost all male and are predominately in the oldest housing. The exceptions can all be explained. Of the ten households with females heads, six have only one or two members, All but one of these six have an elderly woman as head of household. The single-female in group one housing is a young woman just splitting off from her parental household (and may, in fact, be a very temporary situation). The three two-person households with female heads in group two housing moved into that housing when it was first built. They probably split off from larger households at that time (1978-82). At the same time, two similar two-person female-headed households remained in group one housing, but each already had its own house and was already a separate household. When the group three housing was built these two households did vacate the old structures to move to the new ones. The difference was that even after the group two housing was built, the demand was greater than the supply and need for more space was the main distribution factor for these female-headed households. After the group three housing was built, these pressures were somewhat relaxed and it was possible to recognize the social status of the elderly by the concrete allocation of new housing.

The remaining female-headed households are somewhat more difficult to explain. Those in group three housing moved from group one housing, and so fit into the case outlined above. Each was not high enough on the list to get group two housing when it was first completed since each already had a house of its own at that time. They were entitled to a new house once a larger supply was available, however. The female-headed unit in group two housing also fits this case. Since she was allocated a group two house when they were completed, other people had priority for the group three houses. Only the female-headed unit in group one housing does not fit the rule of allocating a separate and upgraded household structure to female-headed households whenever possible. All of these larger female-headed households are the result of the male head of household dying before the children were fully grown and so represent quite a different sort of household than do the one- and two-member female-headed households.

MAP 1: THE NORTH SLOPE BOROUGH



MAP 2: THE NUIQSUT AREA



NUIQSUT AREA

Figure 2

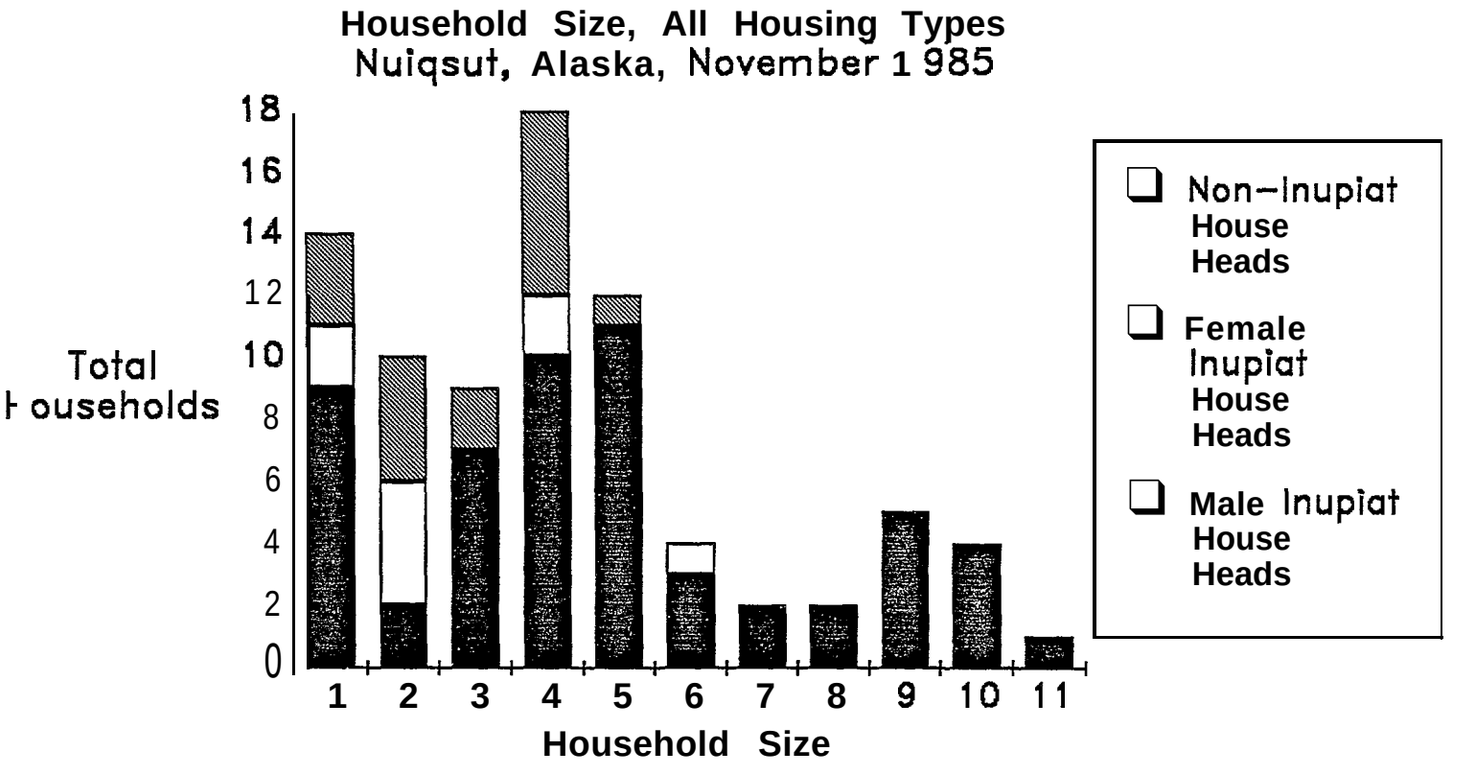

Household Size, All Housing Types
Nuiqsut, Alaska, November 1 985
Total Households
18
16
14
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11
Household Size
Non-Inupiat House Heads
Female Inupiat House Heads
Male Inupiat House Heads

FIGURE 3

Simplified view of residential structure of construction in **Nuiqsut.**

1 = First group of houses, built mostly by ASRC. 1974-1977.
2 = Second group of houses, built mostly by NSB **CIP.** 1978-1982.
3 = Third group **of houses,** built mostly by **NSB CIP.** 1983-1985.
● = Owner-built houses. Most are comparable to first group.

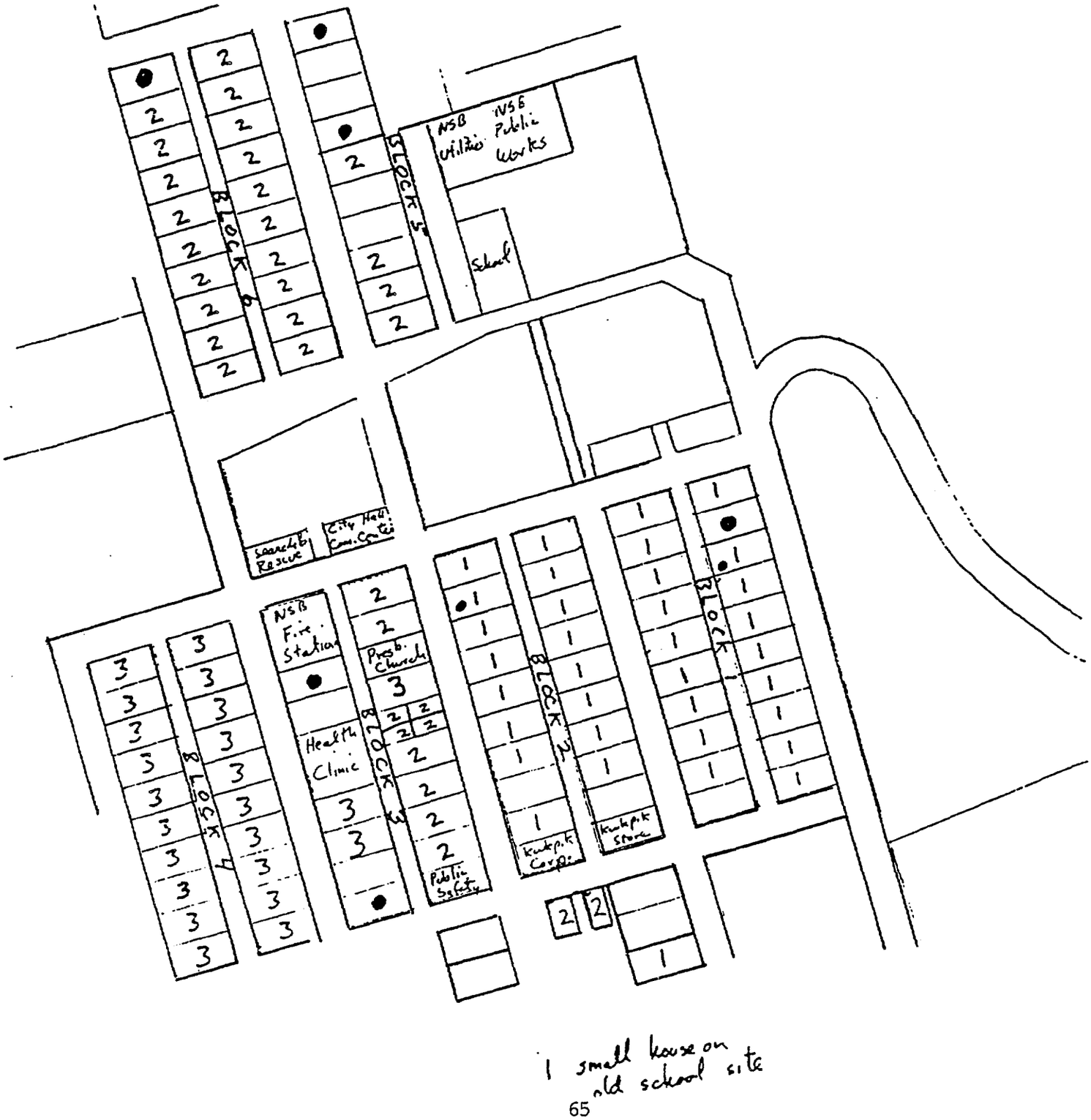


Figure 4A

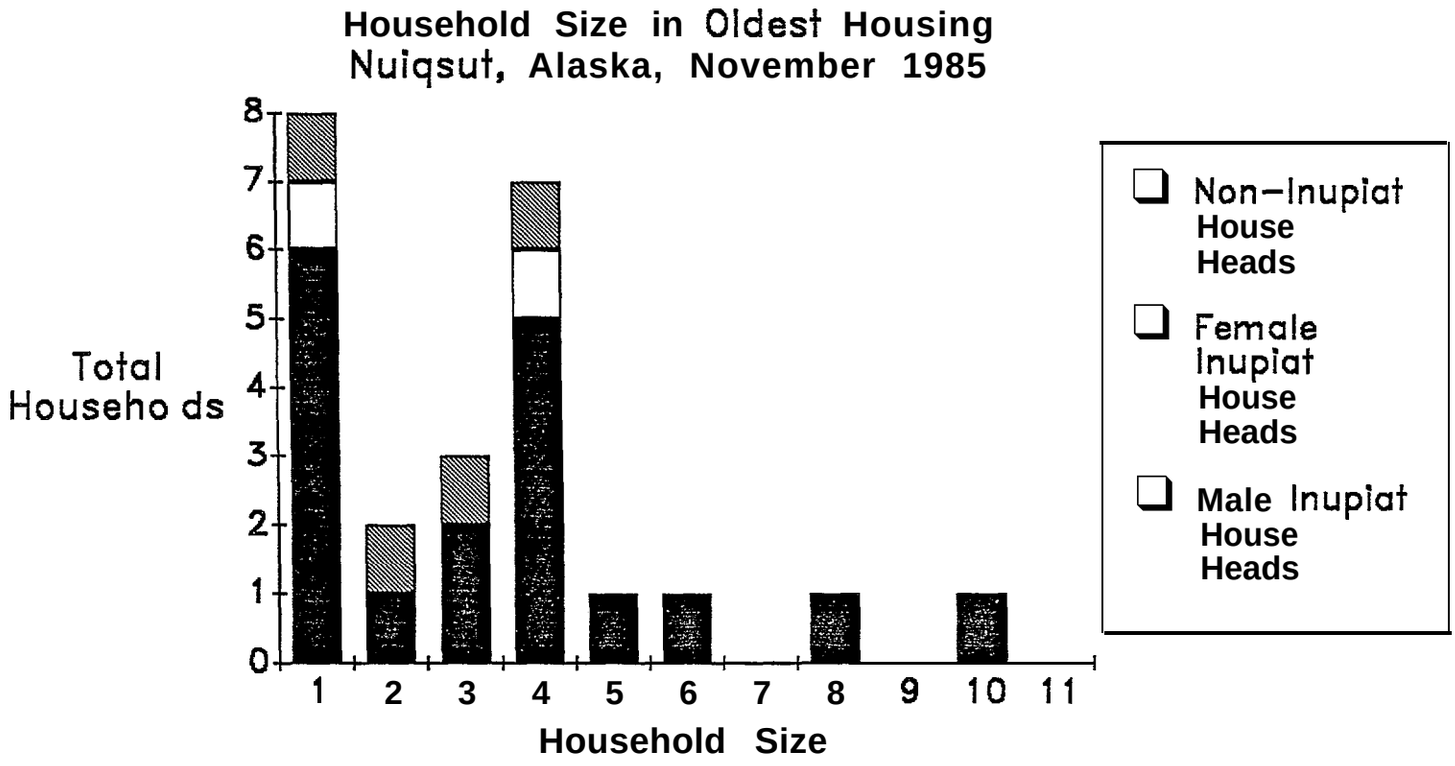

Household Size in Oldest Housing
Nuiqsut, Alaska, November 1985
Total Households
0
1
2
3
4
5
6
7
8
1 2 3 4 5 6 7 8 9 10 11
Household Size
Non-Inupiat House Heads
Female Inupiat House Heads
Male Inupiat House Heads

Figure 4B

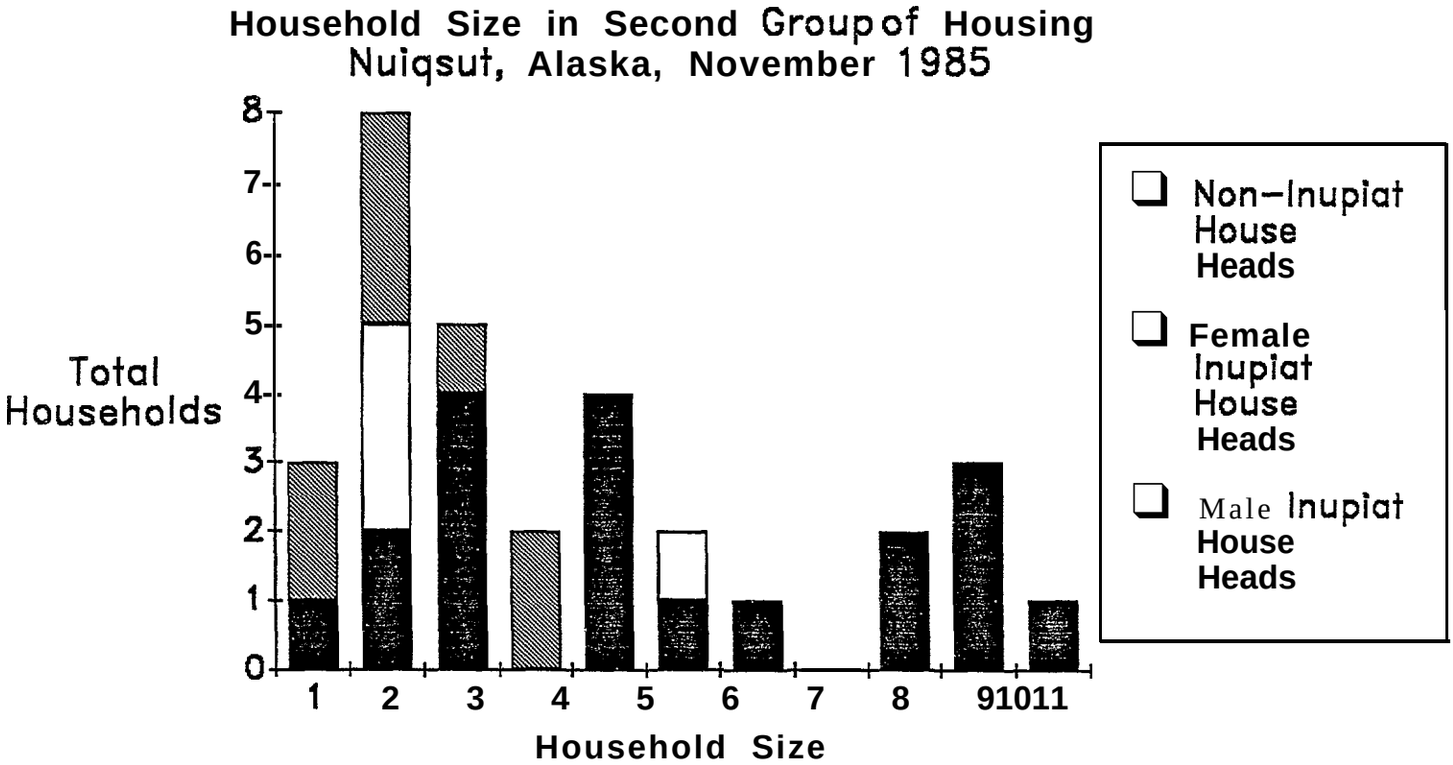

Household Size in Second Group of Housing
Nuiqsut, Alaska, November 1985
Total Households
0
1
2
3
4
5
6
7
8
1 2 3 4 5 6 7 8 9 10 11
Household Size
Non-Inupiat House Heads
Female Inupiat House Heads
Male Inupiat House Heads

Figure 4C

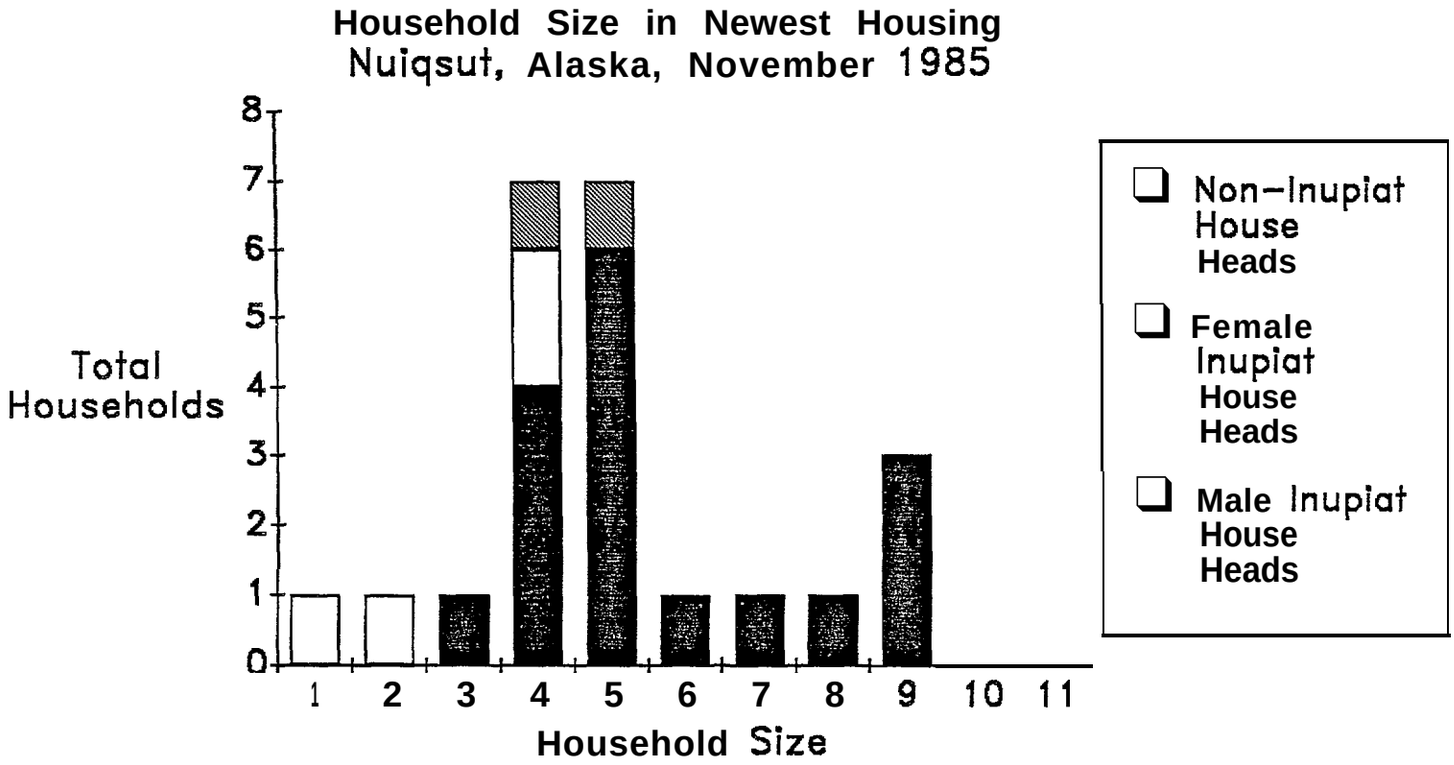
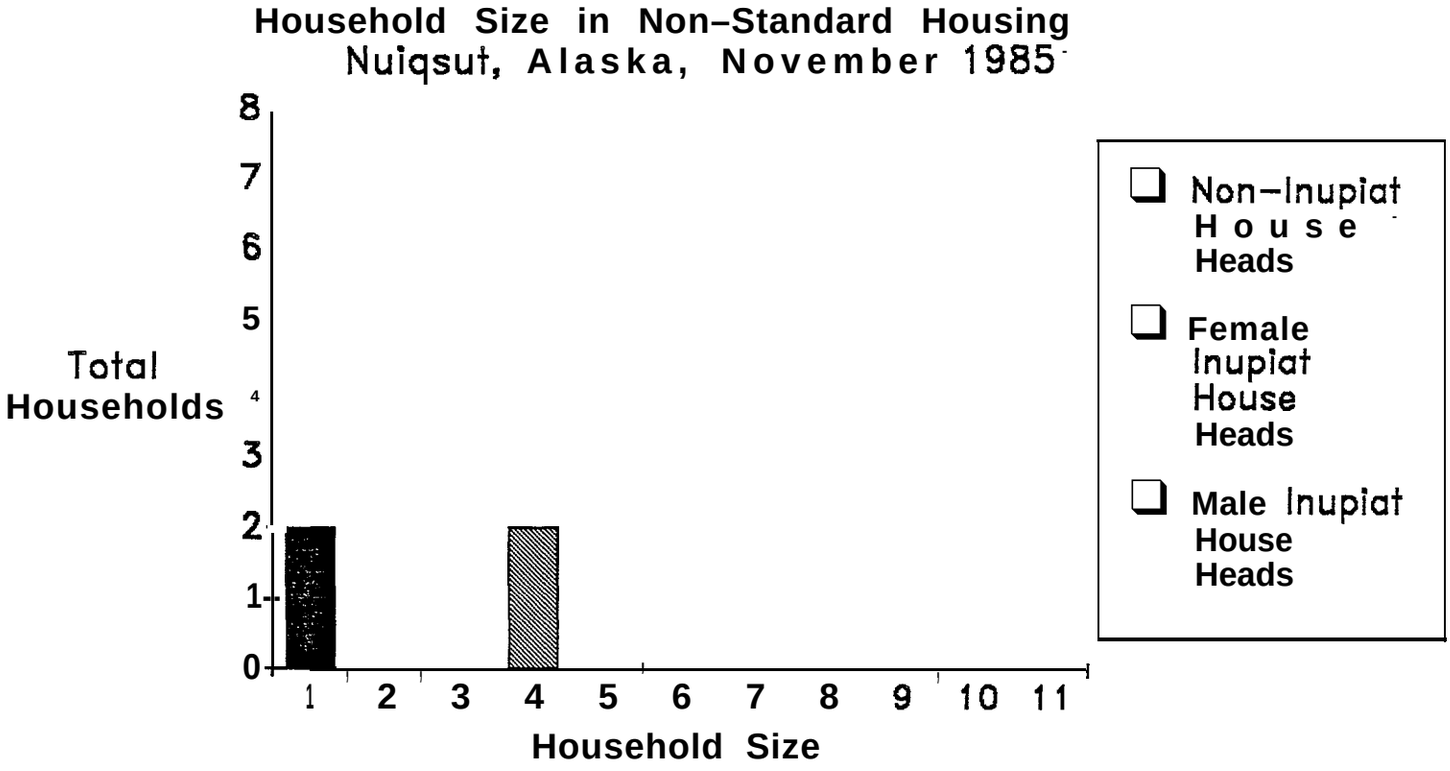

Household Size in Newest Housing
Nuiqsut, Alaska, November 1985
Total Households
0
1
2
3
4
5
6
7
8
1
2
3
4
5
6
7
8
9
10
11
Household Size
Non-Inupiat House Heads
Female Inupiat House Heads
Male Inupiat House Heads

Figure 4D


Household Size in Non-Standard Housing
Nuiqsut, Alaska, November 1985
Total Households
0
1
2
3
4
5
6
7
8
1
2
3
4
5
6
7
8
9
10
11
Household Size
Non-Inupiat House Heads
Female Inupiat House Heads
Male Inupiat House Heads

Business Development/Wage Employment

The main qualitative changes in Nuiqsut's cash economy are the almost complete end to the NSB Capital Improvement Program (CIP) and the increased village interest in oil related employment. During this field period there was almost complete agreement that Nuiqsut had seen the last of the large CIP projects. Indeed, all outlying villages and even Barrow face this same problem. The new NSB mayor was elected on a platform of fiscal reform and accountability, and to implement it the CIP program must be scaled back. Barrow, as the population center of the North Slope, has the best chance to argue for the economic value of large capital improvements. The other villages realize that they will have to find other sources of employment, and this to some degree explains Kuukpik Corporation's increased interest in oil related jobs for Nuiqsut people. There is a warm storage facility under construction in Nuiqsut as part of the CIP, but it is at a standstill now that the piles have been driven. The repairs on the school were also contracted through the Kuukpik Corporation indirectly, but this work is expected to be completed soon.

It was not possible to collect information as detailed as is available for 1982-83, as the field test schedule did not allow for the planned day of research in Barrow (weather delaying plane flights put the research a day behind). Given these conditions, Table 4 is as comparable to page 112 of The Nuiqsut Case Study as possible.

Note that these figures are actually more approximations than anything else. The figure for Pingo/Prudhoe Bay is an informant estimate and is likely to be somewhat high. Still, using them for lack of anything better it is obvious that nearly every non-Inupiat of working age has wage employment of some sort. This is the same as for 1982-83. The general employment rate for Inupiat from ages 20-64 is 47%, compared to a rate of about 46% in February 1983. It appears that Nuiqsut is in about the same economic shape as before, except that in 1983 people knew that the CIP housing construction would start shortly. This project was completed in the summer of 1985, and now the only future work that is guaranteed to be available is oil-related. Texaco has made a commitment to hire 12 local Inupiat in connection with their oil drilling on the Colville River delta. Ten of these positions are on the drilling crews and two are to monitor the environment around the drill site. Similarly, Hess Oil has committed to hire four local Inupiat in connection with their drilling. Essentially, exploratory drilling is occurring all around Nuiqsut and people are reconciled to its inevitability. One of the largest attitudinal changes to have taken place in Nuiqsut is this realization that oil development must be accommodated rather than fought tooth and nail.

This is evidently how people are beginning to think of the permanent road that is being considered that would link Nuiqsut to Prudhoe Bay, and the rest of Alaska and ultimately the lower 48, through Kuparuk. The road from Kuparuk to Prudhoe Bay already exists, so all that remains is for the road from Nuiqsut to Kuparuk to be built.

TABLE 4

EMPLOYMENT IN NUIQSUT, 11/85

	INUPIAT		NON-INUPIAT		
EMPLOYER	MEN	WOMEN	MEN	WOMEN	TOTAL
North Slope Borough					
Utilities Department & Public Works	9	1	2	0	12
Clinic	0	3	0	0	3
Public Safety	0	0	2	0	2
School					
Teachers, Adm.	0	2	5	5	12
Maintenance	2	2	1	0	5
Support	2.5	5	0	1	8.5
Other	0	0	1	0	1
City of Nuiqsut	2	2.5	0	0	4.5
Kuukpik Corporation					
Permanent					
Officers	2	2	0	0	4
Office Staff	2	1	0	0	3
Store Staff	0	4	0	0	4
Part-Time	2	0	0	0	2
Seasonal	11	0	0	0	11
Post Office	1	0	0	0	1
NSB Presbytery	1	0	0	0	1
Self-Employed	2	1	0	0	3
Pingo/Prudhoe Bay, Kuparuk	14	1	0	0	15
Other	0	0	6	1	7
TOTALS	50.5	24.5	16	7	98

Funds have been approved for the road and most people in Nuiqsut are in favor of such a road. They see the economic advantages of cheaper prices for consumables and fuel oil as worth the trade-off of increased access to Inupiat land for non-Inupiat. They hope to be able to regulate such access, or to at least make it economically beneficial to themselves as a group.

It is also clear that oil companies are becoming better at public relations, or perhaps are merely devoting more attention to it than before. At the present time, ARCO is conducting a study of the Colville fishery before any significant oil development occurs in the delta region. Oil companies are constructing ice roads in the winter so that they are also usable for the Inupiat. Before, Inupiat considered oil ice roads as intrusions that went no place that they wanted to go, and the Inupiat had to pay for the construction of ice roads that they wanted (either through the village or the NSB). Oil companies are now informing the villages of all their intended activities--so much so, in fact, that Inupiat in Nuiqsut no longer pay much attention to the notices. They are posted in public places in the village (the Post Office, the Kuukpik Store) and there are too many of them to keep track of and to comment on. In general, the attitude is that people hope someone is keeping track of all the oil activity, but that it is beyond the ability of an average villager. The NSB is expected to fulfill this function, and the Kuukpik Corporation to a lesser degree.

Several times informants said that enough jobs exist for the people of Nuiqsut if they wanted to take them. Most exist outside of the village and people expressed a preference for work inside the village. Table 3 indicates that the number of permanent jobs in Nuiqsut is about the same as it was three years ago while the population has increased 27%. Seasonal jobs can no longer be expected to be available, which would leave oil related jobs as the only alternative if employment is to remain near former levels. That this is recognized by those in Nuiqsut is clear from the number of people said to work at Prudhoe Bay or the Kuparuk Industrial Center now as opposed to three years ago. Three years ago people were waiting for the summer construction jobs, which paid better and were more enjoyable than oil work, and had the additional advantage of giving the worker the rest of the year off. Oil related work is year round and imposes a different work discipline, but also gives an employee time off (generally two weeks on and two weeks off). The agreements with oil companies regarding local hire also make it clear that Nuiqsut workers now see oil related jobs as an economic necessity.

Commercial Business

There has been a downturn in the commercial sphere of Nuiqsut's economy, to judge by the fate of the commercial establishments that were in existence in 1982-83. Three of the five stores have closed (only one because the proprietor left Nuiqsut). One of the others was only open sporadically at that time and maintains that pattern. Of the "full-time" stores, only the Kuukpik store maintains continuity with the past, and it is apparent that its inventory is not at the level that it was in 1982-83. They also display a notice that credit is limited and quite frequently run out of change and money. There is really no place to cash a check in Nuiqsut and a pattern has developed where people will use a paycheck to buy a number of smaller money orders at the post office. These are then used as paper money throughout the village. There is a constant need for cash in Nuiqsut, however, and most people think it is due to the underground economy in alcohol and other drugs.

There are three other stores in operation in Nuiqsut at present. One is primarily a convenience store selling soda, snack food, and cigarettes. A second sells a small assortment of more staple items, but has a small inventory. This store also sells craft items. It was formally licensed by the state in 1982-83, but was not open during the research done at that time. The third store is really the only competition for the Kuukpik Store in Nuiqsut. It opened about two years ago and has a fairly complete inventory. People say that the inventory is much more steady, and more things are consistently available, at this store than at the Kuukpik Store. This store gives no credit, but usually has cash available, at least to grocery buyers. The proprietor estimates the cash needs for Nuiqsut to be at least $5000/week, and maybe $10,000/week. This store cannot supply that demand, but if the Kuukpik Store would cooperate in bringing cash to the village the proprietor believes the cash problem would be alleviated. However, this is not likely to happen.

This store did not start to make a significant profit until over a year of operation. Until that time the proprietor was in essence subsidizing it with wage income. Once the store did become profitable, the couple who run it became fully self-employed. The husband does other things to earn money--guiding fisherman and hunters, selling fish, and such--but the store is now this couples' main source of income. They have consciously looked at the Kuukpik Store and tried to avoid some of the mistakes they have seen there. They estimate that they can turn over the inventory in their store (which is in one of the old houses) every two weeks, This does not include what they have in storage in a second old house.

Changes in the condition of the economy can recognized in changes in consumption patterns at the stores. Not much meat is sold when the hunting is good (as it was in the summer of 1985) but at present the store is nearly out of meat. The villagers seem to especially like chicken, but will also buy beef. They do not seem to be fond of pork chops, possibly because they don't know how to cook them. It is difficult to sell anything unfamiliar. The store usually does sell quite a bit, at a pretty constant level, unless there is a very serious money problem in the village. The usual purchases are non-meat items to accompany or fill out the meat or fish served. This is things like bread, noodles, and pilot bread. The store also sells quite a bit of food that is fast to prepare, both for people to take out with them trips and to use at home. People buy a lot of canned pasta (ravioli, beeferoni), cup of noodles, canned spare and hash, and other canned goods. The best sellers are chips, candy, sugar, and soda. The last item is the most difficult to keep in stock because people drink it so fast. Overall, purchases have tended to decline over the last six months, particularly the higher-cost items, as the economy has begun to slow down.

The cafe that was open in 1982-83 has closed, at least until the summer. The pool hall is similarly closed. The Dredge Camp has been closed down. Three airlines have representatives in Nuiqsut, but two of them are informational and ticket personnel only. The third airline does base a plane in Nuiqsut. All operate out of private homes.

Kuukpik Corporation

It would be useful to have detailed information on the Kuukpik Corporation, but its officers are understandably hesitant to discuss such matters

with an outside researcher. Kuukpik is involved in a number of coventures with other corporate entities, among them the Arctic Slope Regional Corporation, the NSB, Barrow's village corporation, and Pingo (an organization of all the NSB village corporations except for Barrow's). Kuukpik also has some understandings with the oil companies exploring around Nuiqsut which essentially guarantee that if drilling does occur locally that Nuiqsut people will benefit economically.

Many villagers remarked that Kuukpik still was in very poor financial shape, but this could not be checked in any real way. Documentation is open only to Kuukpik shareholders. The Kuukpik office did not appear to be too busy, but then, limited observations have very little utility. Kuukpik did close down the second store that they had operating for a short while, and the main Kuukpik Store does appear to be doing poorly as well, but these are also not very good general indicators.

Kuukpik Corporation did have two offices in Anchorage which they recently consolidated into one. Again, this could indicate cash flow problems or merely a good business decision. This is a joint venture with an Anchorage engineering firm. All employees in Anchorage are non-Inupiat and include an Executive Director and several draftsmen.

Subsistence

The field test yielded no information directly comparable to The Nuiqsut Case Study, because of time constraints. Interviews with key people did allow a discussion of change and likely change, however.

Fishing was good this year (1985), in contrast to 1982-83 when fishing was very poor. The fishery study people say next year will be very good as well, but that the following several years will be poor. Last summer was very good for caribou, again in contrast to 1982. As of November 1985, the hunting was not all that good near Nuiqsut and people who had worked for wages during the summer were having trouble finding caribou. They had lots of fish, as did nearly everyone else, but most people were rather tired of fish. During the field test several hunters were observed leaving the village on all but two days (these two days the weather was too poor to go out). There were no doubt others who were not observed, as these were not systematic observations.

There are now five active whaling crews in Nuiqsut. Only four of them whaled out of Nuiqsut in 1985 (in the fall) while the fifth goes to Barrow to whale. Two of these active captains have recently captured whales. Last year the captain who goes to Barrow captured one there. Because of the quota system and the fact that he was officially whaling out of Barrow, it was a Barrow whale and the muktuk and meat stayed in Barrow, for the most part. The only captain who has captured a whale for Nuiqsut recently did so two years ago. It was butchered on Narwhal Island and then flown by plane to Nuiqsut. After ice formed between the mainland and the island, a snow machine caravan from Nuiqsut brought the rest of the whale back. This was considered a necessary but unfortunate way to have the whale brought back, but did have the advantage that the whale carcass served as bait and hunters got five or six polar bear and several fox off of it.

There are many whaling captains in Nuiqsut who have been inactive for some time. They whaled in Barrow or Kaktovik for the most part and would return there if they decided to whale again. At least some of these inactive captains

think that whaling out of Nuiqsut is somewhat silly, because Nuiqsut is so far inland. The difficulty of transporting a whale to Nuiqsut, and getting one's equipment to the whaling site from Nuiqsut, are the reasons they give. They keep their equipment in other villages. They have not registered with the Alaska Eskimo Whaling Commission for the most part, for reasons that are not clear. An opinion was expressed that some of the younger captains looked on whaling more as sport than as a subsistence activity, and that they entered it with a spirit of competition rather than reverence. The ideal, for older captains at least, is to serve one's community by capturing a whale. This idea, some say, is being lost among the younger captains. They gave no idea of how large a problem they thought this was (that is, how many captains had the "proper" attitude and how many did not). The opinion was expressed more as a trend that was happening than as a description of the current situation.

Two of the captains whaling out of Nuiqsut are brothers who have taken over from their retired father. They are thus relatively young. The other two captains are older, in their 50s. When last they went out one of the older captains had a young woman in his crew who went out in the boat. This seems to be somewhat unusual ethnographically as far as whaling is concerned. However, the evidence for women as hunters and fishers is quite strong. Also, this woman has a reputation in Nuiqsut as a hunter that some of the young men may envy. Traditional whaling practices have been changing ever since first contact with Europeans, so there is little reason to think that such practices are now static.

Three years ago there was only one active whaling crew out of Nuiqsut. The subsequent increase is due to people putting together the financial resources to be able to buy the necessary equipment and to provide for a crew on the ice for a month or so. There are still several men in Nuiqsut who express a desire to captain a crew who are waiting until they can afford all of the equipment. At least one of them already has a whaling gun.

The relation between the wage and subsistence economies is not simple and direct. The need for subsistence resources is fairly constant. Only so much can be consumed and Inupiat do prefer subsistence food to store-bought food. The take is not necessarily related to the time spent hunting. One informant guessed that the area used to hunt in will expand as the time available to hunt increases. Time to hunt can increase by choice, choosing not to work for wages, or by necessity, if no or few wage jobs are available. The same informant said that probably the number of different people who went out would be no greater, but that each person would make more trips. He could not say much about the potential for conflict between villages over hunting ranges, but thought that it would be a small problem at worst. Such ranges presently overlap, at least through time if not at the same time, with no conflicts so far.

Oil development is going to occur in some of the richest subsistence range used by the inhabitants of Nuiqsut. The development that has so far most directly affected Nuiqsut, the Kuparuk oil field to the east, is luckily in the direction of the least densely concentrated subsistence resources. Even so, Nuiqsut hunters use this area for hunting to a much smaller degree than would be expected. They claim they do not feel comfortable hunting near Kararuk, that "it is not a satisfying experience." They attribute this to the oil development and the attempts by the oil companies to have hunting restricted in this area. Inupiat know that they are entitled to hunt this area, but feel uncomfortable knowing that the oil companies would prefer them not to. A small minority of Inupiat may purposely hunt near the oil field to upset the oil people, but not too

many. This raises the question of what the threshold of oil development is that will prevent hunting in a certain area, and if it is related to the richness of the subsistence resources in that area or not.

The physical characteristics of an oilfield like Kuparuk are hard on equipment as well. The roads are built up well above the tundra, making it necessary to go up and then down, often with a full sled following the snow machine and while looking out for traffic on the road. The pipelines necessary to collect and transport the oil are too low to go under and so require that a hunter ride much farther than would otherwise be necessary. The gravel used to construct the roads spreads easily and wears out equipment very quickly. For these reasons, locals would hope that any oilfield to be developed near Nuiqsut will be designed differently from the ones that have been developed so far.

The areas that will be affected in the near future are the Colville delta area, one of the most productive fisheries on the North Slope, and the Teshekpuk Lake region, important for caribou and fowl as well as general hunting. If these areas were lost for subsistence activities, Nuiqsut people would be confined to going south. This would not be acceptable, and known oil sources exist in that direction as well (capped). In addition, an exploratory well was drilled at Fish Creek, which is northwest of Nuiqsut and is a popular and productive fish and game area. The results have not as yet been released to the public.

Subsistence must then be monitored in relation to the commercial economy. Interviews must ask about perceptions as well as behavior, as in some sense subsistence is more important as a set of values than as anything else. "Subsistence" is often used as a shorthand term for that set of values and behaviors dependent upon access to the land. The maintenance of that access is perhaps the simplest way to conceive of what the central land issue on the North Slope is about.

Political Control

There are two obvious local arenas for political action in Nuiqsut. There are also a number of local organizations whose inner dynamics and actual composition are greatly affected by local political processes. In addition, of course, Nuiqsut is greatly affected by policies of the North Slope Borough, which in fact operates most city facilities and services, as well as by the State of Alaska and the Federal Government through oil lease sales, subsistence resource management, and so on.

Any discussion of political change in Nuiqsut must start with the local arenas. The Alaska Native Claims Settlement Act (ANCSA) set up, among other things, a village corporation for each Native village which was to receive a cash settlement payment and the surface rights to a certain amount of land (subsurface rights belonging to the regional corporation, in this case the Arctic Slope Regional Corporation, or in certain cases the Federal Government). In Nuiqsut this is the Kuukpik Corporation. Nuiqsut, as a second class city, also has a City Council consisting of seven members elected at large from Nuiqsut's population. The city was entitled, under ANCSA, to 1280 acres of land from the Kuukpik Corporation. The rest of the land surrounding Nuiqsut is essentially the corporations. Since one does not have to be a Kuukpik shareholder to be a resident of Nuiqsut this creates an institutional source of potential friction.

Other local organizations likely to be politically important in the near future are the traditional council and/or a formally recognized IRA (Indian Reorganizational Act) group. These two, as they are talked about in Nuiqsut, would serve the same purpose but the first can be formed locally, while an IRA must meet the requirements of the Federal law. The formation of either would involve only Kuukpik Corporation shareholders functionally, as a major purpose of these organizations is to prevent the alienation of Native rights to the land. Non-shareholder residents of Nuiqsut obviously have an interest in this problem as well, however.

In 1982, the Nuiqsut City Council consisted of four Kuukpik Corporation shareholders and three non-shareholders (registered in Barrow rather than Nuiqsut). The City Clerk was non-Inupiat. In 1985, the City Council consists of the same three non-shareholders (one of whom is again mayor). One of the same Kuukpik shareholders also continues to serve. Of the remaining three members, only one or two are shareholders. The City Clerk is a relative newcomer who is married to a shareholder (and officer) of the Kuukpik Corporation. This notwithstanding, the City Council is perceived to have a non-local bias. This was true in 1982-83 and seems to be even more so now (although this may change in the near future).

The Kuukpik Corporation makes decisions by a seven member governing board elected by the shareholders. Five of the seven on the board in 1982-83 continue to serve in 1985. A sixth member of the 1982-83 board continues to work in the Kuukpik office. One of the new board members belongs to the same family as a former member, while the seventh is a relatively young man who recently returned to Nuiqsut to live. As a whaling captain and a member of a rather large extended kinship group, his power base is among the largest in the community and may in fact begin to rival that of the kinship group which has more-or-less controlled the Kuukpik Corporation from the beginning. Still, as with the City Council, the composition of the Kuukpik Corporation Board and the community perceptions of its concerns remains pretty much the same in 1985 as in 1982-83.

An examination of the City Council minutes (now in much better shape than in 1982-83) indicates that the issues now are the same as in 1982-83. Dog control remains a periodic problem. The regulation of bingo games and seemingly annual accusations of financial irregularities are regular issues as well. The City Council, either in regular meeting or in special session, is used as the community forum to inform people about local research projects, what the NSB intends to do in terms of construction and services, and what oil development firms are planning to do in and around Nuiqsut.

In 1982-83, relations between the city council and the Kuukpik Corporation were somewhat strained, but not uncordial. The mayor at that time (and now again, after a year as a regular council member) was and is the father-in-law of Kuukpik Corporation's president. The main problem between the city and Kuukpik was the conveyance of the title to 1280 acres of land from Kuukpik to the city. There was more than principal involved, as the NSB was constructing houses and a health clinic at the time and was buying the land upon which to build. At issue, then, was whether the City or Kuukpik would receive these funds. As the City's only source of funds is revenue sharing, this was important to the City. Kuukpik also could have used the money as their cash flow was rather disrupted at this time. Relations began to fall apart after a council member insisted that a lawyer be hired to press for the land conveyance. Against the better judgement of the mayor, the council agreed to do so without objection, and the land was

eventually conveyed to the City. In the meantime, the council member who had most pressed for the lawyer and the conveyance became mayor. It was during this time (October 1984 though October 1985), informants say, that the relations between the city and Kuukpik deteriorated greatly. Now that the old mayor has returned, relations are expected to improve again.

This friction seems to result more from the pattern of Inupiat leadership than from individual personalities, however. The mayor for October 1984 through October 1985 attributes the City -Kuukpik problems to jealousy of the " City's recognition as the group to deal with by outside agencies (oil companies, research teams, the NSB) when in fact those groups wanted to do things on land controlled by the Kuukpik Corporation. The mayor also had multiple roles as mayor, village-coordinator (essentially a liaison with the NSB), and the owner-operator of one of the best stocked and most used stores in Nuiqsut. It is said that anyone who does too much or is too successful is pressured until adjustments are made. This does describe why this person did eventually give up the office of mayor and the position of village-coordinator. This also seems to describe the career of the first mayor of Nuiqsut, who was at the same time the president of the Kuukpik Corporation. He first withdrew from village politics to concentrate on helping his people through the corporation, but now has no formal tie to the corporation other than his shares. He is the only whaling captain to land a whale for Nuiqsut (other captains living in Nuiqsut have landed whales for Barrow or other villages) and so does command a great deal of respect. The pattern of Inupiat prestige/leadership seems to be as strong as ever, and the preference for nonconfrontational resolutions to issues is quite marked. The reelection of the old mayor reinforces this conclusion.

Politics is perceived, at least normatively, to be nonpartisan in Nuiqsut. There are no formal parties and even talking to people in search of their vote is considered in somewhat bad taste. A person does not put himself forward, but ideally waits to be chosen. The Kuukpik Corporation believes that a violation of this principle by the City Council is currently costing the corporation contracts with the NSB. Kuukpik claims that the City Council members worked for the reelection of Eugene Brewer as NSB Mayor in November 1984. Kuukpik felt obligated to support his opponent to keep things even in the village. When Brewer lost, and even though the Corporation supported the winner, the Corporation still felt as if the village as a whole had lost some clout in Barrow because of the strong Nuiqsut support for Brewer. This perception also helped to foster the strained City-Corporation relations of the past year or so.

The Kuukpik Corporation is formally endorsing the formation of a traditional council in Nuiqsut by employing two men part-time to work on this. They research what needs to done, educate villagers about the issues, and work to implement the council. Kuukpik sees this as one way to solve the inherent conflicts between the corporation and the non-shareholder residents of Nuiqsut. The corporation, as it is now organized, must act in the financial best interests of its stockholders. The city must strive to meet the needs of all its residents. A traditional council, under the recognized authority of the community elders, would replace the City Council and constitute an entity whose advice and will the corporation could listen to. Part of the retribalization process to from a traditional council would involve the passing of new bylaws for the Kuukpik Corporation that would insure the nonalienation of shares in the Corporation. This would ensure that the shareholders understood and agreed to the change in the corporation from a purely profit-oriented institution to one also explicitly interested in protecting traditional values. The replacement of the City Council

by a traditional council would replace an institutional form that was imposed on the village by a more traditional institution more in line with community values.

Most people in Nuiqsut outside of the corporation give the traditional council or an IRA little chance of success, however. They say that time will run out before 1991, and that shareholders will not want to give up their individual rights for the common good anyway. They point out that a substantial minority of the people who would benefit from the formation of a traditional council or IRA to protect Inupiat access to the land would be non-shareholders in the Kuukpik Corporation. Some shareholders claimed this did not bother them, but there was too little time to discuss this issue with enough people to reach any conclusions except that that debate is likely to become more heated as 1991 draws nearer.

Housing

The allocation of newly-built housing can be used as an indicator of political process and criteria of community membership. The first housing in Nuiqsut (group one) was allocated by lot to those who resettled the village and helped in the construction of the houses. This involved about thirty-five housing units. When the NSB constructed group two housing, they attempted to allocate it according to a list of rules. These were never made clear to the people in Nuiqsut, however, and there was and is some feeling that too many of these units were misallocated. Of the thirty-three units, the NSB kept six to use for NSB employees. Two were Kuukpik Corporation trailers, one of which was used for storage and one of which was rented to a young family split off from an existing household. Of the remaining twenty-five, seventeen were filled with people from within the village and eight with families from outside of Nuiqsut. These people were related to Nuiqsut families, but a substantial number of them were not Kuukpik Corporation shareholders. The old houses from which the Nuiqsut families moved were for the most part left vacant at least for the moment. Some non-Inupiat families occupied three temporarily, but no Inupiat family took the opportunity to move to Nuiqsut from outside of the community by moving into one of the older houses. Some people felt that it was not right for those outside of Nuiqsut to get new Nuiqsut houses rather than allowing those in the old houses to move. They say that connections with the powers that be in Barrow were used to gain precedence over real Nuiqsut residents. Be that as it may, of the twenty-five units available to the populace at large, eight (32%) went to "outsiders" and seventeen (68°/0) went to insiders.

When group three houses were built an attempt was made to have an explicit list of allocation rules. Prominent among these were date of application for new housing, income, and place of residence. The result was that of the twenty-one units (one was reserved for NSB use and one was constructed by Blackstock Construction and donated to the Presbyterian Church to be used as the church residence), seventeen (8 1%) were occupied by people moving out of the oldest houses in the village. The remaining four (19VO) were filled by households from outside of Nuiqsut, but all four have sibling relationships to households already existing in Nuiqsut and it is likely that all are Kuukpik Corporation shareholders. There are still people who complained about who received houses and who did not, of course, but at least within Nuiqsut most people seem satisfied. The principle of fairness is used to summarize how people think of this. Those who have lived longest in the oldest houses deserve the first chance at the newest houses. The two large families which still occupy group one houses appear to be exceptions, but instead demonstrate another facet of resource distribution. One

household is that of the first mayor-president of Kuukpik, who is also a whaling captain. The second is that of the present Kuukpik president who is the eldest son of a renowned whaling captain. Neither have many personal resources, but both have redistributed resources to others. One of the prices of leadership (or past leadership) is the need to sometimes use less than the people one is serving. At least, that is the traditional Inupiat view expressed by these men and others.

One other formal body, the school advisory board, must be considered in regard to its political implications. This board has no legal powers as such. It purely advisory to the governing School Board in Barrow (every village has such an advisory school board). Thus, many of the NSB/Barrow-outer village conflicts find their expression through this forum. It is interesting to note that the composition of the advisory school board (five members) is almost a subset of the City Council. The one exception, the president, was on the City Council but lost his seat to one of his fellow advisory board members. The school thus seems to be seen as a village matter, and one that the City Council should have responsibility for. There seems to be little disagreement among the people of Nuiqsut on this. At least in regard to the school, Nuiqsut presents a united front to the NSB and Barrow. That is, this is one arena where being a resident of Nuiqsut is enough. Kuukpik Corporation membership is beside the point.

On the other hand, it may well be that the interests of the two groups simply happen to coincide in this arena so that the city can indeed be trusted to look out for the interests of all. The composition of the advisory board in 1982-83 was quite different. The president was the same, but the other four members were quite different, categorically. Three had close connections to the Kuukpik Corporation and the other felt very strongly that non-Inupiats in the school should be replaced with Inupiats within three years. This has not occurred, for obvious reasons, including a shortage of interested, qualified Inupiats. Instead, the express objective of the school to make progress towards providing an education that will allow Nuiqsut Inupiat to compete on equal terms both inside and outside of Nuiqsut. Again, it appears that the change in the composition of the advisory board reflects the agreement in Nuiqsut that this is the sort of education which is now necessary.

The North Slope Borough

The history of Nuiqsut is intimately tied to that of the North Slope Borough. The linkages between the two communities have, and continue to be, extraordinarily strong. Kinship ties, economic ties, and political ties between the two entities exert a profound influence on the decision making process in Nuiqsut. Given the fact that the future of the North Slope Borough depends upon future oil development, it is equally clear that Nuiqsut will ultimately have to follow suit. If times are good for the oil industry and prices are high, perhaps the NSB could afford to continue the CIP program at a relatively high level. This would mean that oil companies would continue to explore on the North Slope, however. If times are not so good for the oil companies and prices are down, as at present, the NSB loses tax revenue and is pressured into fostering oil development to make up for the lose. As the Prudhoe Bay and Kuparuk fields age and decline in productivity, this pressure will increase. Non-Inupiat informants are of the opinion that resource development (oil, coal, minerals) will assure the physical existence of Nuiqsut for at least 100 years. The question is whether it will be a Native village for that long.

Community Well-Being/Social Differentiation

This section deals with a number of topics which center on the theme of community well-being. These include community health (social and physical), community facilities and resources, education, formal and informal organizations, and relations between Inupiat and non-Inupiat.

Public Health

The Nuiqsut Case Study describes general village clinic records for one year and analyses the records for November 1982 in somewhat greater detail. That month was unfortunately not representative of the year as a whole, so comparisons here will be to both the yearly and monthly figures from that report. Clinic records for the month of September 1985 are the source of current information.

There were 149 visitors to the clinic in September 1985 (one with age unknown). Of these, eighty-three (55.7%) were women and sixty-six (44.3°/0) were men. This is almost exactly the breakdown from the 1982-83 yearly totals and most monthly totals except for November 1982. There are no significant differences in male and female complaints, except for those which are obviously sex-specific and accident related complaints (which men have twice as many of). Of the 149 visitors, forty-one had secondary complaints and eight had tertiary complaints for a total of 198 complaints. Again, the yearly breakdown for 1982-83 adequately represents the current information except that respiratory complaints have decreased to 10.6% (from 19.3%), infectious diseases have increased to 18.2% (from 13.49'0), and accidents have decreased to 5.1% (from 13.0%). All other categories are within three percentage points of the 1982-83 rate, which, given the variability previously shown in the clinic data, is not significant on a month-to-month basis. It is interesting to note that the one health aide interviewed said that diseases such as cancer and diabetes were becoming increasingly common, but that they had not been seen among Inupiat until recently. This is not evident in the clinic records. This is most likely explained by the fact that it is a local small-scale clinic. Cancer and diabetes are diagnosed and treated outside of the village and would most likely be noted in the clinic records as health maintenance if a person inside of the village were being monitored. The health aide attributed the increase in cancer and diabetes to smoking and a change in diet. She especially noted the "junk food" and "piles of sugar" that all younger Inupiat seem to consume. Store owners confirm that their best selling items are soda, sugar, candy, and snack (junk) food.

One area in which there has been a significant change is in the portion of the population which uses the clinic. Using the number of visits by people in certain age-sex categories divided by the total number of people in that age-sex category in Nuiqsut yields results in the 45% to 57% range for all categories except females 4 and under, for whom the rate is 850/o, and males 15-44, for whom the rate is 19%. Repeat visitors of course mean that this statistic overstates the proportion of the population using the clinic, but not by much. It is clear that males, other than dependent children and men over the age of 44, do not use the clinic much except in emergencies. This is the same pattern as in 1982-83.

Public Safety

Information comparable to that from 1982-83 was available but was logistically unobtainable. Informal conversations suggest that the pattern of disruptive behavior in Nuiqsut remains pretty much the same. Most serious

problems are alcohol related, and alcohol and drug abuse are still serious health problems. The field research period was too short to obtain observational information on this subject. However, it is clear from comparing the censuses and listening to people that there have been what is considered a large number of violent or accidental deaths in Nuiqsut since 1982-83. People talked about five specifically and implied that there were others. The community voted to "go dry" in 1983 and a brief period of relative calm insued. Within less than 12 months, however, alcohol-related arrests increased to the point where the local police officers claimed that no appreciable difference in alcohol use frequency or related problems resulted from passage of the law.

Statistical information of this sort is obviously useful as an indicator and would normally be obtainable. Public Safety summary statistics, combined with information on cases actually taken to court, would provide an indication of the level of community disruption and the perceived seriousness of most offenses.

Community Facilities

An inventory of the physical plant of a community can be a good indicator of change or at least an expression of what a significant number of community members regard as important change. An open-ended question of the nature "What have been the significant changes to occur in this community over the last five years" will almost invariably generate responses concerning community facilities. In Nuiqsut, several additions have been made since 1982-83. A Community Center/City Office building has been built. This allowed the City office to be moved out of the Kuukpik Corporation building (where some tension between the two was evident) and also potentially gives an alternative to the school for the site of recreational events. Unfortunately, the community center is only open on weekends when the school is not.

A new terminal at the airport has also been finished, but as yet (November 1985) has not opened. It is believed to be too expensive to maintain during the winter. The generators at the utilities plant have been upgraded so that the new housing can be serviced. The new clinic has been completed and is open. The City now has a bus as well, which tours the city. Two drivers provide service throughout most of the day. It should be noted that all of these projects were government financed.

In the private sector, there are few recreational options. The cafe and the pool hall are both closed, at least temporarily. Bingo continues to be run by the Mothers' Club and the Health Board, among other groups.

Education

The school is a key institution for the community in several ways. It is a center for recreation for the young and a meeting place for adults in the evenings. It is an institution which affects all community children through the formal instruction it provides and the atmosphere in which this instruction occurs. How well the school reflects community wishes and values determines to a great degree how successful it can be in providing an education which the students and their parents perceive as useful. In this regard, the school in Nuiqsut appears to have made some significant improvements.

The most significant statistical changes are that teacher turnover is low, less than 15% in the last two years compared to an annual rate of at least 70% before 1983. Attendance is averaging 94-96%, compared to a formal figure of 86% for 1982-83. However, the previous definition of attendance was somewhat lax. Tardiness is now less than 5%, compared to a very high (but undocumented) rate in 1982-83. Discipline problems have declined so that while last semester the school averaged ten teacher/student conferences a week and three to four parent/student/teacher conferences a week in regard to behavior problems, this semester there have been only five such conferences total. These changes are almost without exception credited to the new principal, now in his second year in Nuiqsut, and the teaching staff.

Changes for which formal documentation does not exist, but which was readily observable, were also obvious. Students no longer spat (almost all students from ages five to sixteen chewed tobacco in school until last year) or swore in the school. Whereas before maybe one or two Inupiat parents would come to talk to the teachers at the school's open house, it was observed that many parents now take advantage of this opportunity. Community attitude towards the school is difficult to measure, but seems to be much improved. Parent interaction with teachers, student attendance and tardies, number of students who go on to post-secondary schools, and test scores are key indicators of changes in educational institutions. From all of these measures the success of the Nuiqsut school has increased dramatically. Whereas before the school was seen almost totally as an alien institution with little connection to the rest of Nuiqsut, most community members now appear to perceive it as one of the centers of the community. Most families have a formal connection to it through their children and the school is making a great effort to communicate with them.

In this regard, it should also be noted that several teachers are taking part in the community life of Nuiqsut in a way that teachers have not before. Teachers are not trying to assume leadership roles outside of the school, which they still see as inappropriate, but are more fully assuming the role of community member rather than transient teacher. Teachers are now sponsoring two social groups new to Nuiqsut. "Young Life" was described as a Christian group for non-Christians and meets hi-weekly in a teacher's house. It is predominantly for teenagers and young 20s and seems to be meeting with success. A Sunday school group has also been started and meets every Sunday. Both groups arose from the personal Christian convictions of the teachers involved. Neither is affiliated with any labeled denomination. Both have the sponsorship of the Nuiqsut Presbyterian Church, but more as a formal matter than anything else.

It should be noted that achievement in the school still leaves much to be desired, but this is a recognized problem. Achievement levels have been improving and, now that attendance is at a reasonable level, can be targeted with some hope of success.

Additional Formal Organizations

The two groups discussed above are the only new organizations discovered during the field test. Most of the groups discussed in The Nuiqsut Case Study are still in evidence and have changed in the ways described above. The Church operates in much the same way as before. Average weekly attendance continues to be relatively low (twenty to twenty-five). The Mother's Club continues to help people in need, and the Health Board, which oversees the clinic, continues as

before. Their activities are most in evidence, however, in their function as bingo operators. The Fire Department has now been formally split off from Search and Rescue, but both operate the same way as before. Nearly all able-bodied Inupiat men in Nuiqsut are at least nominally members of one or the other. Officers tend to be identified more with the City Council than any other formal institution.

Conclusions and Tentative Projections

The above analysis of institutional change in the three years since Michael Galginaitis conducted his original research in Nuiqsut reflects our attempt to mirror the analysis prepared for North Slope Phase I monitoring study by use of the baseline data. The summary makes little attempt to go beyond the strict "monitoring" objectives of the field study. The objective of a monitoring methodology is to measure and report change over time. It is not intended to operate as an instrument to project future change.

It is our feeling, however, that public anticipation and expectations regarding imminent changes are prominent components of adaptation to contemporary events. Thus, while the objective of the study has been to test and validate the Phase I monitoring methodology, some tentative projections, at least short-term projections, may be supported by our analysis of the institutional indicators employed in this study. . This would appear particularly appropriate given the relatively dramatic change in the economic context of the study region since the time the original researchers conducted their study of the North Slope (and during which they formulated the methodology).

Our discussions in Nuiqsut revealed a general sense of disorientation (though not yet distress) regarding the future of the community and, for the most part, residents see themselves in a transition period between two distinct periods of community development. There has been, of course, a sense of frustration resulting from the loss of jobs and community income (and recent Borough problems), but several informants reported this as more of lull between events than as a terminal event. These perceptions may be expected to change by the summer of 1986. The recent economic f ecus of the community, as a result of the downturn in CIP expenditures, has shifted toward the implications of unemployment and the impending requirements for social welfare assistance, the potential of oil-related employment to resolve current problems, the impact of the road to Prudhoe and Fairbanks, and toward future regional and local Native Corporation activities as economic supports.

Economic Subsidization

Economic subsidization has been a central concept in the very existence of Nuiqsut. The community was formed, under the leadership of a very small group of Barrow residents just over a decade ago, with the specific intent of controlling (economically, physically and politically) an area of the North Slope believed to hold significant future value. It has, since that time, been heavily subsidized by the North Slope Borough through its Capital Improvements Program (CIP) which has since become the principal employer of the community of Nuiqsut and the activities of the Arctic Slope Regional Corporation (ASRC). Primarily through its construction program, the residents of Nuiqsut have been employed in building their own homes, school, roads, sewer systems, airport, and so on, since

the beginning of the community in the early 1970s. With the elimination of many of these positions, the level of unemployment in the community has increased significantly (i.e., community population has increased significantly while employment levels have remained constant). This change, however, has been met with less concern than might have been anticipated. Again, it is the expectations with regard to imminent employment in oil-related activities in Kuparuk or Prudhoe Bay that appear to have mitigated the psychological effects of the CIP downturn.

Employment

Given both the elimination of most of the CIP employment opportunities and the established consumption and lifestyle patterns dependent on relatively high levels of cash income, the quest for oil-related employment at Prudhoe must dramatically increase over the next year or two. Two additional factors must also be considered: first, that Prudhoe and Kuparuk oil firms are eager to increase their local and "Native" hire employment statistics. Second, Nuiqsut residents are not highly regarded as employees. They are considered relatively undependable, often failing to arrive for work on time or at all. Unlike Nuiqsut where alcohol is not openly available (Nuiqsut voted to outlaw the sale of alcohol in the community in 1983), it is openly available in Prudhoe and Deadhorse and the social climate tends to promote consumption. Established drinking patterns of the Nuiqsut population tend toward overconsumption, binge drinking and "throw away the (bottle) cap" bouts of consumption. The oil companies make no effort to control the behavior of their employees during their off hours and these circumstances favor the kinds of problems that tend to occur among the "local hire" employees.

From another perspective, Nuiqsut employees have had a very difficult time adjusting to the kinds of work, the patterns of work, and the periods of work at the oil-support facilities. They are normally employed in "helper" (intended as sort of an apprentice system) positions to pipefitters, welders or mechanics and have shown relatively little interest in developing the skills of these positions. There is little in their history to indicate a predisposition to this kind of work. They are expected to work the same cycle as their non-local counterparts (most of whom reside in Fairbanks or Anchorage) --twelve hours on and twelve hours off, seven days on seven days off (or fourteen on and fourteen off). This has proved to be a very difficult adjustment for Nuiqsut residents. First, it has been difficult to adjust to the work-focus of life on the Slope. The twelve hours a day of work leaves little time for other activities and is apparently conducive to bouts of rapid alcohol consumption, tardiness and absence. The seven day work pattern, on the other hand, has been tolerated by some and totally rejected by others. Most agree, however, that returning to work after a seven day absence is extremely difficult and has been a major reason for the high turnover among Nuiqsut employees.

While employer changes in these work patterns would likely result in some improvement in the retention of Nuiqsut employees, they would not solve the central problem--Nuiqsut residents have yet to recognize dependency on, and long term requirement for, remunerative employment. This is likely to change in the very near future. The recent, and abrupt, elimination of CIP positions has caused the aggregate employment level in Nuiqsut to fall precipitously. This was, however, only just beginning to be recognized as a "problem" at the time of our field test. The savings and "stored capital" in the form of social debts, fuel, merchandise, and so on, will cushion the effects of higher levels of unemployment for perhaps the next six months or so. After this time, i.e., within the six to

twelve month period, community recognition of the "problem" will become widespread and will be a matter of increased concern. Already there has emerged a general sense of insecurity regarding individual employment opportunities--once this anxiety reaches the level of the community, however, we would expect to see a significant increase in negative social indicators--e. g., increased alcoholism, police call-outs, medical visits, and political conflict over available resources.

While a detailed rationale for the formation of the community is not central to our analysis, it may be useful to look at the early expectations for the community and contrast them with the actual effects as a possible indicator of the community's sense of well being. That is, whether or not members of the community believe they have achieved what they set out to do, is expected to influence their sense of well being. In this sense, it can be fairly stated that Nuiqsut has lived up to expectations. Nuiqsut is situated directly in the middle of oil activity on the North Slope and has had, and will continue to have, a voice far greater than its numbers would suggest in future mineral exploitation in this region of Alaska. Indeed, just over a decade ago there was no Nuiqsut at all and were it not for the planning, subsidization, and machinations of a group of Barrow residents, there would be no Nuiqsut today. That Nuiqsut sits astride the eastern border of the NPR-A, just a few miles south of the oil finds on the Colville River delta, just a few miles southwest of the Kuparuk fields and just 50 miles west of the vast known oil resources of Prudhoe Bay, suggests convincingly that Nuiqsut will remain a key community in the political control of North Slope oil development.

Thus, in many senses, Nuiqsut has exceeded original expectations. Nuiqsut's role in the region has not come without very high economic costs to the North Slope Borough and the ASRC. Virtually every facet of the development of the community has been underwritten by the Borough (housing, schools, roads, sewers, etc.). The political, economic and social linkage between Nuiqsut and the Borough is extraordinarily strong and stands out as very different from communities of many other regions of Alaska. It must be borne in mind throughout our analysis that what happens at the regional level will continue to have profound implications for sociocultural change in Nuiqsut. The intensity of this linkage in the North Slope and the relative absence of this relationship in the Aleutian-Pribilof region must be borne in mind in tailoring our reapplication of the methodology to the Aleutian-Pribilof region.

The residents appear to be divided on the long-term economic outlook for Nuiqsut. On the one hand, it is difficult to envision how the community can support itself without extensive (and even increased) subsidization. On the other hand, by settling in such close proximity to the known locus of future oil development activities, the community of Nuiqsut has tied its long-term future to such activities from both a positive and a negative perspective. First, the future of oil development in the North Slope is certain. Although the original Prudhoe field is believed to be nearly forty percent depleted, it still holds sufficient productive capability to carry the North Slope (and Alaska as well) into the next decade. However, it must be remembered that Prudhoe, just fifty miles to the east, is but the first of several areas in which oil has already been discovered in the immediate vicinity of Nuiqsut. Just twenty-five miles to the northeast oil has been discovered and extraction begun at the Kuparuk field while just eighteen miles directly to the north of the community oil in commercial quantities has been discovered (by Texaco) at sites directly on the Colville river delta. It must also be remembered that Nuiqsut sits astride the eastern border of the National (previously Naval) Petroleum Reserve--Alaska (NPR-A).

A cursory examination of the distribution of known oil reserves, recent finds, and current extraction sites will reveal that Nuiqsut will be in the center of future oil activities. In this sense it is important to recognize the intimate link between the fate of the North Slope Borough, the Arctic Slope Regional Corporation, Kuupik Corporation, and North Slope oil development. The fates of each depend on the continued successful extraction of oil from the Slope and, in fact, on the continued expansion of such activities into areas under the direct control and ownership of these corporate entities. Thus, for the intermediate future the economic and social indices are expected to show the results of a precipitous downturn in employment and income resulting from reductions in CIP expenditures and from potentially reduced Borough subsidization. The long-term future of the community, however, would seem to be tied to a succession of oil development projects in the immediate vicinity of the community. The community would then be assured of at least indirect benefits derived from their economic and political position vis-a-vis this activity.

In any case, for the immediate and short-term future, there appears to be no alternative to an ever increasing reliance on oil-related employment at Prudhoe. Completion of the road link will do nothing but enhance the attractiveness of this option.

The Road

The road connecting Prudhoe to Fairbanks (and in reality to the rest of North and South America) is approximately 14 miles away and is funded for completion in 1986. Almost overnight, the community will move from a position of relative isolation with primary transportation and support linkage to Barrow to a position of virtually open access to (and from) Prudhoe Bay and Fairbanks. This change has broad implications for the future of the community, especially within the context of the CIP "completion/downturn. On the one hand, it will mean a significant reduction in the cost of imported goods (i.e., virtually all goods consumed in the community including fuel oil, gas, materials, etc.) and this is almost unanimously regarded as a positive consequence. The road will also mean easier and more economical access to oil-related employment at Prudhoe Bay. Such access will, in turn, have significant implications for future employment and income indices. On the other hand, everyone recognizes the multitude of potentially negative implications of the road. Among their strongest concerns was the impact of Fairbank's hunters having access to Nuiqsut subsistence resources. They recognize that the state's interpretation of subsistence has come to include all residents of Alaska and open access will mean that urban sportsmen will soon be competing within Nuiqsut's traditional subsistence range for caribou and moose. The advent of the road is also recognized to likely result in an increased outsider presence in the community and it is believed that it will result in an increased community population as well. The most frequently cited concern, however, is that open access to Prudhoe will mean an aggravation of an already serious problem of alcohol abuse and social control.

It should also be remembered that the road to Nuiqsut will ultimately become the road through Nuiqsut as oil development proceeds west from Prudhoe. Nuiqsut's role as a way-station for this development will unquestionably increase over the next decade.

Perils to Local Control

The residents of Nuiqsut have long been aware of the threat posed to local control resulting from the stipulations of ANCSA. Of particular concern is the fact that stock ownership in the Arctic Slope Regional Corporation will become open to the non-Inupiat public in 1991. Only the oil companies have any clear idea of the real value of these shares. The Native shareholders, on the other hand, are already severely divided. If an oil company (or major speculator) can successfully purchase fifty-one percent of ASRC stock, they would control access to, and potential ownership of, a vast quantity of mineral resources and would assume control of one of the most powerful political entities in the region. How much would such an achievement be worth? Those Inupiat who see this potential are working hard to develop sufficient political unanimity to successfully oppose public stock ownership, or at least to establish a right-of-first-refusal for the corporations--even though they recognize that this would not be an effective or viable means of retaining Inupiat control of the Native corporation's assets.

In point of fact, however, these "traditionalists" appear to be working against the flow of sentiment, "particularly that of our Indian brothers to the south" on this point. They are also working against internal opposition in the form of those younger, more aggressive, community members who are positively anticipating their own personal opportunities to gain from the sale of their stocks--or, at least, to the very rapid growth in the value of their own stock. This group appears either unconcerned or unaware of the potential negative consequences of external ownership of their corporate shares. Several informants seemed to assume that sufficient Native shareholders would retain their shares and that the ultimate ownership of the corporation would not be endangered. The distribution, derived from a rather cursory and unscientific sampling of the community, seemed to indicate approximately thirty to thirty-five percent of the residents of Nuiqsut were already weighing the costs and benefits of the sale of their stock. To this must be added the effects of the recent economic/employment downturn in the community and the natural reflexive reaction to evaluate potential alternative sources of income.

APPENDIX "B"

EVALUATION:
NUIQSUT APPLICATION OF PHASE I MONITORING METHODOLOGY

SOCIOCULTURAL MONITORING METHODOLOGY WORKSHOPS

Conducted for

THE U.S. DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

at

THE SHERATON HOTEL

ANCHORAGE, ALASKA

DECEMBER 16-17, 1985

by

IMPACT ASSESSMENT, INC.

APPENDIX B

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Evaluation: **Nuiqsut** Application of Phase I Monitoring Methodology

Additional Methodological Considerations

Evaluation of the Nuiqsut Field Test of the Phase I Monitoring Methodology

Objectives

Introduction

In our proposal we set out the following objectives for the workshop sessions.

> The evaluation workshops will be designed to accomplish three interrelated objectives: First, to assess, as accurately and impartially as possible, the utility, precision and validity of the North Slope sociocultural monitoring methodology. The second objective is to evaluate the field, analytic, and methodological conclusions derived from the field test of the methodology. The third objective is to assess the utility of the methodology for application in other coastal regions of Alaska subject to OCS effects--with particular attention to the Aleutian-Pribilof region. The weight of the effort will be pointed at refining the methodology for use in the four representative communities of the Aleutian-Pribilof region.

The Nuiqsut field test was designed to assist in meeting each of these three objectives. First, it was designed to evaluate the utility of the methodology in general and in particular to identify the strengths and weaknesses of the field data collection methodology and operationalization of the data categories. Second, the field test was designed to evaluate the findings derived from application of the methodology. Third, the field test was to provide the Phase II researchers with an opportunity to become familiar with the protocols, objectives and techniques which will be involved in replicating the original methodology in the Aleutian-Pribilof region and to discover which features of the methodology would require modification prior to application in the Aleutian-Pribilof region.

Our original intent, as stated in our proposal, was to reapply the identical protocols and utilize the original seven methodological domains developed by the Phase I researchers, and to tailor our analysis to parallel that of the Phase I research to best assure comparability between the two studies. These objectives, for several reasons, were modified just prior to the field test itself. First, little time or effort was allocated by the Phase I research team to the development of the field or analytic methodologies themselves, and these methodologies were, therefore, not sufficiently described to allow a rigorous replication. The Phase I effort was concentrated primarily on developing the institutional analysis and not on development of methods. Second, it was recognized that the protocols developed and submitted as Appendix F in the draft version of the Phase I study had not been of significant use in generating the data or in interpreting the results of the original field workers. Third, the Phase I team acknowledged that the treatment of variables, issues, domains, etc., was not consistent across communities and would be difficult to replicate. Fourth, the final version of the North Slope study, available only after our proposal was submitted, concludes that

The analysis indicated that five issues emerged as significant in monitoring institutional development and change:

1. Population
2. Political Control
3. Wage Employment and Business Development
4. Housing
5. Land

(Monitoring Methodology and Analysis of North Slope Institutional Response and Change 1979-83: p. 1)

Taking all of these issues into consideration, it was concluded that our field test of the methodology, and subsequent reapplication of the methodology in the Aleutian-Pribilof region, should concentrate on the five areas identified in the final report. In addition, it was recommended that we integrate as many of the original variables identified in the North Slope monitoring methodology as possible. Attachment A provides a summary view of the kinds of variables we attempted to employ in the field test and evaluation.

It should be noted that this study was intended to concentrate on "in"stitutional change," not "social indicators." There are, however, important areas of overlap that must be identified. First, it is our belief that the health care system operating in rural Alaskan communities is indeed an "institution" warranting careful scrutiny and that changes in health care delivery services over time provide important indicators of institutional as well as broader sociocultural change in a community. For these reasons, we have included changes in health requirements and services as significant indices of sociocultural change. Similarly, changes in educational institutions and services have become important objective indicators of sociocultural change and are examined by us in Nuiqsut and will be examined in the Aleutian-Pribilof region.

Field Data Collection

Michael Galginaitis and I (John Petterson) departed for Barrow on November 5, 1985 where we met briefly with Mr. John Carnahan of the North Slope Borough to explain the objectives of the study. That evening Michael met with two of the teachers who had recently moved from Nuiqsut to Barrow. The next morning we met again with Mr. Carnahan, very briefly with Ms. Karla Kolash, also of the North Slope Borough, collected pertinent documents from the Borough and departed for Nuiqsut. We had no difficulty obtaining housing with a group of fishery researchers and began our discussions with local residents immediately. The benefits of having done extensive research in the community just three years earlier was soon evident. Michael was received as an old friend, was quickly bombarded with "news" of events and changes in the community, and the research was underway. The research was divided with me bearing responsibility for discussions with those in official roles (or fixed locations) of one sort or another (e.g., mayor, subsistence researcher, public safety officers, school principal and teachers, health clinic personnel, store owners and so on) while Michael conducted one-on-one discussions with local residents in their homes, in social encounters

at the stores, in church, at bingo, and so on. I refereed the high school basketball games on Friday and Saturday between Nuiqsut and Barrow and seemed to be well received thereafter. Even though Michael bore the major burden for collecting information during our stay (frequently returning from his interviews after midnight and once as late as 3:00 a.m.), I nevertheless felt that this rather intense one-week research period was one of the most productive in my experience.

Evaluation Criteria

Our specific objectives in the Nuiqsut field test, with the changes noted above, were to evaluate the reliability, validity, utility, cost efficiency, and so on (see Attachment B for the criteria by which we originally intended to evaluate the methodology), of the Phase I monitoring methodology developed by Chilkat Institute, and to identify those features of the methodology which could be directly reapplied to the Aleutian-Pribilof region, those which would require further modification, and those which would have to be eliminated. The evaluation, of course, anticipates the use to which the methods are to be put in our study of the Aleutian-Pribilof region.

In view of the conclusions of the Phase I study (noted above) and the overly general nature of the original protocols, we concentrated our effort on deriving, from the Phase I analyses and conclusions, those questions which will have to be utilized in our own application in order to generate comparable data bases and analytic conclusions. Our field test, then, utilized a slightly modified version of the five issues recommended in the Phase I final version to assess institutional change which has occurred in Nuiqsut since the time of the earlier MMS Nuiqsut case study fieldwork. At the same time we attempted to develop sufficient information on the variables in Attachment A to allow direct comparison with the Phase I analysis.

Replicability

The replicability of the monitoring methodology is a key element in realizing the MMS goal of establishing a long-term capability for inter-regional research comparability. It is essential to the study objectives, for inter-regional comparisons and methodological consistency, that the methodological approaches utilized in the North Slope study be retained wherever possible.

The replicability of the Phase I methodology was evaluated according to the following criteria: (1) operationalization of variables, (2) general inability (idiographic versus nomothetic components), (3) validity, (4) reliability, (5) precision, (6) required expertise and, finally, (7) an evaluation of the relative cost effectiveness of the data collection objectives (or variables), data collection techniques, and analytic approach.

Operationalization

The most fundamental requirement of a methodology is that it provide its users with an understanding of the process or procedures by which meanings are assigned to a variable--i. e., operationalization of the variables. Operationalization is both the clear identification and differentiation of the variable itself as well as the "specification of the activities of the researcher

in measuring the variable or in manipulating it" (Kerlinger, 1973:31). Our intent was obtain sufficient published and unpublished information from the original contractor which, when combined with our field application, would allow us to address the question "Is sufficient information on data collection tools, data sources and availability, implementing procedures and evaluation methods provided so that other researchers can come to comparable analytic conclusions?"

In summary, we feel additional effort will have to be applied to the original methodology in order to adequately operationalize the variables for use by future researchers.

Generalizability (idiographic/nomothetic)

A fundamental objective of the field test was to determine which components of the methodology were culture or community specific (idiographic) and which would be generalizable to other communities and cultural contexts (nomothetic). As is invariably the case, Nuiqsut proved to be both representative of certain kinds of changes occurring in the North Slope and reflected in the larger Phase I institutional analysis and unrepresentative of others.

In summary, on the basis of the field test we did not categorically eliminate any of the monitoring variables or issues utilized in the Phase I study. We have, however, throughout the body of this summary and evaluation, suggested modifications to the methodology which we feel will provide a sufficiently broad coverage of the institutional changes that will allow effective monitoring in other rural coastal communities of Alaska.

Validity

Another criterion used to evaluate the field test was whether or not the variables were valid. That is,

> It is not sufficient for a measure merely to be reliable... To be valid, a measure must actually measure the variable we wish to measure and not some other variable (Brim and Spain, 1974:22, emphasis in original).

As noted earlier, we were unable to utilize the protocols employed in the Phase I monitoring methodology and cannot, therefore, evaluate the validity or invalidity of their methods. We can, however, agree with the original authors in their use of the population and demographic changes, changes in the locus and organization of political control, and economic changes as useful and necessary elements of a valid monitoring program. The workshop sessions are expected to assist us in refining the component variables of these measures of institutional change.

Reliability

Our assessment of the reliability of the methodology is based on our appraisal of the degree to which reasonably qualified and experienced independent researchers would generate same data base and comparable analytic conclusions. While we did not employ the Phase I protocols in the field, it is our belief that

our analytic conclusions are at least consistent with those of the Phase I researchers though it is clear our emphasis is slightly less on political control and slightly greater on economic changes. This is predictable given the gravity of the changes to have taken place in the economic orientation of the region since the Phase I researchers developed their methodology and prepared their report.

Precision

A fifth aspect of the monitoring methodology to be assessed is the precision of the data generated by the methodology.

> Precision, in this context, refers to the number of distinctions that can be reliably and validly made as to the amount of variable present when it is measured (Brim and Spain, 1974:24).

Two specific forms of precision were addressed in our field test: (1) degree of change and (2) direction of change. Again, since we were not able to utilize the protocols we could not evaluate the specific data collection tool designed by the Phase I contractors. On the other hand, we were able to compare the analyses conducted on the five issues they identified as appropriate for monitoring sociocultural change in the North Slope. On these issues we can say that comparable data bases can be established and that parallel analytic approaches can be applied.

An evaluation of the validity, precision and utility of our refinement of the issues into sets of data collection objectives suitable for use in communities of the Aleutian Pribilof region must await the results of subsequent field work. On the whole, however, we feel the Phase I analytic approach, if not data collection techniques, is capable of recording representative and useful features of institutional change.

Required Expertise

The intent of the Phase I product was to provide a field data collection instrument and analytic approach which could be reapplied by a professionally trained, reasonably competent field researcher--the results of which, when integrated with available secondary and quasi-primary data, would support a useful, cost efficient, monitoring of sociocultural change over time.

This section addresses the question "To what extent is the methodology an 'expert system' capable of replication only by an expert, i.e., dependent on the sophistication, experience or background of the analyst?" The level of expertise necessary to competently employ the methodology is not specified in the original methodology. Some attempt, however, must be made to clarify the expectations of competence inherent in the methodology and analytic approach. This is an important issue in that it will limit in significant ways who will be able to utilize the methodology, the extent of the variability in the quality of the research, and the character of the ultimate conclusions to be drawn from the analysis.

There are several facets to our answer. First, this kind of a study is-concerned with monitoring sociocultural change--change that occurs over long

periods of time as well as short and intermediate term change. Thus, it requires an extraordinary familiarity the kinds of social changes which Alaskan rural communities, subregions and regions have experienced over time. A primary, i.e., critical, criterion is that the analyst or researcher must have had extensive first hand data collection experience in rural Native communities prior to attempting to conduct this kind of research. Without the assumptions, expectations, and understandings inherent in such an experience it is difficult to imagine a competent analysis of change being possible. At a higher analytic level, reapplying the methodology will require that the researcher have a fairly thorough understanding of the broader forces of social change affecting Alaskan rural, particularly Native, communities. The role of such forces as ANCSA, Limited Entry, the Molly Hootch decision, satellite television, etc., in effecting change in these communities must be understood in order to differentiate, at least in general terms, background effects from those related to OCS or other development. Finally, the researcher must have sufficient understanding of theoretical models of change to be able to grasp the implications, significance or meaning of the observed changes. The objective is not just to record environmental changes but to assign them appropriate weights according to their implications for subsequent changes in the sociocultural system itself.

This being the case, utilization of the methodology occurs at three levels: at the ground level with collection of appropriate primary data, at the secondary level with the integration of primary and secondary data, and at the tertiary level with the interpretation and analysis of the findings. Different kinds of expertise are required for each of these levels but it is clear that the greatest weight must ultimately be placed on the secondary and tertiary levels of analysis and on the expertise of the prospective analyst at these levels.

In summary, in all three respects the North Slope monitoring methodology is an "expert" system. First, the development of the North Slope methodology was based on extensive prior field experience and data collection in the region. Second, it is evident that previous experience was essential to the integration of the secondary data base with the field data. Finally, it is critical to the interpretation of the material that the analyst be intimately familiar with (1) the broader sociocultural forces affecting rural Alaskan communities and with (2) the models and theories constructed to explain or interpret these changes. Many of the social changes which rural Alaskan communities have experienced have parallels in other rural American communities, and in communities in lesser developed countries. Because of this, they are therefore open to the same kinds of analytic approaches found in the literature, however, the details of the changes occurring among the largely indigenous communities of Alaska's rural coast are different enough to require in-depth, on-the-ground familiarity in order to adequate gauge (i.e., monitor) them. Thus, the methodology is not only an expert system today but can be expected to remain such for the foreseeable future.

Interpretation of Findings

While the collection of primary and secondary data can be routinized, the critical aspect of the design of an effective methodology is the specification of how the data are to be interpreted, i.e., what the analyst is expected to look for in interpreting the information provided by the data collection process. This is clearly the most difficult component of the methodology to standardize. How can we specify how a particular piece of information is to be interpreted without overly determining the results of the analysis?

For example, how is one to interpret the finding that a community has shown an average three percent population growth over the last decade? As a single independent index of change, this is a virtually useless statistic. In setting out the criteria for interpretation, then, the two most important dictums to be imposed on the analyst are (1) to look at all the factors that have gone into creating the indicator so that he knows precisely what is "indicated," and, equally importantly, (2) to look at each individual indicator in relation to all of the other indicators before attempting to establish the meaning or implications of the finding. In our very simple example of population increases, we would want to know whether population growth had increased three percent each year or had grown in a dramatic spurt somewhere in the ten-year period, resulted from a dramatic spurt and then decline, a decline and increase, or whatever. We would want to know whether the population growth resulted from natural increase or emigration, the exact relationship between the two, the previous and current ethnic mix and sequence of changes, the changes in age distributions, and so on, just to obtain a very rudimentary understanding of the meaning of the index.

Once the analyst understands the index he or she can then begin to compare and contrast the index (hopefully juxtaposed according to the sequence of growths and declines) against other indices of change to further define and interpret the sociocultural changes that have occurred. For example, how does the sequence of changes in employment compare with the sequence of population changes? What correspondences are there between these changes and large scale (remote or local) industrial developments (road construction, resource development projects, etc.)? What other indices will help us interpret the changes in ethnicity, and how can these indices, in turn, be employed to understand regional sociocultural change? This process goes on until the analyst emerges with a relatively holistic view of the changes that have occurred--a view that will continue to be shaped by each additional piece of information (or index) that is considered. The reliability, from the individual analyst's perspective, continues to increase as the accuracy of the expectations implied by his or her "construction" or "model" increase.

The analyst, particularly relatively inexperienced ones, must be advised, however, to be continually aware of how his/her own expectations and projections tend to influence the process of data collection and interpretation. The best solution to this problem is to routinely draw up (clearly specify in writing) what kinds of information would invalidate critical components of his/her model of the community or data base and how one could and should go about verifying or rejecting his model (i.e., hypothesis testing). Without such care, we would have to agree with R.D. Laing that

> The theoretical and descriptive idiom of much research in social science adopts a stance of apparent "objective" neutrality. But we have seen how deceptive this can be. The choice of syntax and vocabulary is a political act that defines and circumscribes the manner in which "facts" are to be experienced. Indeed, in a sense it goes further and even creates the facts that are studied.

Cost Effectiveness

The objective of a monitoring effort is to develop a system of measuring institutional change that can be consistently applied with least possible cost and highest return (in terms of accuracy and utility of findings). In addition to the standard protocol discussion, we attempted a new (for us) field technique of having informants themselves evaluate the changes by comparing conditions as reported from several years earlier. This seems to provide both a very high degree of accuracy (consistency across informants) as well as utility to the analyst (and user). The technique, discussed in detail later, is very cost effective, provides the informant with a very concrete sense of his or her own value to the researchers, and, indeed, is very effective in portraying the objectives of the researcher to the informant in a way that will be immediately understood. The process also tends to accelerate the integration of the researcher into the community by demonstrating his or her familiarity with the social organization of the community. We would strongly caution however that such an approach tends to narrow the perspective of the informant and that appropriate safeguards against unreliable reportage be taken. We recognize that this approach will not always be possible, but where it can be used we feel the quality of the monitoring will be enhanced.

This process is cost effective for other reasons as well. Since our variables are largely preselected, informants can be selected on the basis of known expertise in particular areas. We do not need to establish a large sample size, a randomized selection process, or invest extensive energy into indirect questioning or participant observation. Only a few individuals in the community will be qualified to respond to questions about changes in health, educational, or political institutions. Changes in economic institutions, as well, are relatively open to this data gathering technique.

Unfortunately, we do not feel our field approach lent itself well to a rigorous variable-by-variable evaluation of relative cost efficiency at this level. We do feel, however, that our research in the Aleutian and Pribilof Islands will allow such an appraisal.

Additional Methodological Considerations

In addition to assessing the Nuiqsut field test on the basis of the above evaluation criteria, a number of other methodological considerations were identified and are discussed below: these include data and analytic triangulation, links to previous studies, integration of primary and secondary data sources, time frames for bracketing periods of change, timeliness of secondary data sources, and several others.

1. Triangulation

We found that the number of data cross-checks possible is significantly limited by field time and cost constraints. Traditional long-term field data collection would allow the researcher to triangulate his or her findings through discussions with several individuals on the same subject. This results in a general degradation of findings and a reduction in detail. The analytic conclusions, in turn, must be made on a more abstract level.

2. Links to previous studies

Monitoring sociocultural change must be a building process in two key areas. First, the analysis of change relies on the social, economic, demographic and cultural data collection and analyses which have preceded the monitoring effort. The analytic quality of the monitoring effort must largely depend on the quality of the baseline data against which changes are to be assessed. Thus, the importance of an adequate baseline cannot be overemphasized.

Second, the monitoring program must be designed in such a way that it builds upon and can be integrated with the theoretical and methodological efforts of previous MMS studies conducted in different regions of Alaska. For example, the "Social Indicators" study conducted in the Nana and Aleutian-Pribilof region developed and measured a set of indicators of potential benefit to the current work, and against which we expect to be able to make very accurate assessments of particular kinds of changes. This provides the MMS with (1) a means of establishing continuity between studies, (2) of building on the analysis and conclusions of previous studies, and, eventually, (3) pinpointing the locus and source change in a community or region, and (4) establishing cross-checks on the validity of the different methodological approaches to measuring social change.

3. Integration of Secondary and Primary Data

The role of secondary data sources and the interrelationship between these sources and the primary data base will be the subject of discussion during the workshops. At this point we would note only that the kind of monitoring program anticipated by the MMS is expected to require an increased reliance on secondary data collection procedures than has hitherto been the case. This, in turn, will demand a much closer scrutiny of these secondary sources and a clear idea of the sensitivity of each indicator in response to particular environmental changes. For the most part, however, we have concluded that the accuracy of the relatively outdated federal census data (population, employment, income, housing, etc.), frequently artificial state revenue sharing population figures, village or regional corporation enrollment figures, and so on, is dubious at best. Such indices, such as total population figures, provide only long-term trends which reflect only the aggregation of sequences of events (growths and declines). This often tends to camouflage rather than point to change. Thus, the sociocultural monitoring program must be designed so that it allows the analyst sufficient on-the-ground primary data to interpret the secondary data from the perspective of the immediate social and cultural context within which the changes have taken place.

In the same vein, the most useful quasi-primary data sources for monitoring sociocultural change at the community level are local record keeping systems. obviously, minutes from community council meetings, monthly health records on visits and kinds of illnesses, and public safety records indicating crimes, arrests and relative conviction rates, and so on, are essential ingredients of this data base. In addition to these familiar data sources, however, we are advocating the integration of other quantifiable, or at least routinely and consistently collected, data sources. These include, for example, school attendance records, standardized test scores, school age/grade distributions, English language proficiency assessments (at least for entering

kindergarten children), and so on, which can provide very accurate and sensitive (e.g., 6-12 month sensitivity) indicators of change (which, when tied to other indices, can fairly precisely point to certain kinds of change). Local employment records provided either by particularly knowledgeable informants or from the records of the local Borough authority (in the case of Nuiqsut) or from city or corporation sources (in the case of St. Paul or Sand Point) provide very sensitive and very precise measures of changes in employment (and can be used directly to assess changes in incomes). Other highly sensitive and commonly available socioeconomic indices include changes in the sequence or quantity of fuel purchases, changes in local store inventories or sales totals, changes in types of consumer goods sold (e.g., increased purchases of staples and decreased purchases of imported meats are very accurate and sensitive indicators of changes in the availability of cash). Other examples for potentially valuable (and very sensitive) indicators of change include increased or decreased hotel occupancy rates (e.g., Sand Point, Unalaska, or St. Paul) and airline records which, when tied to other indicators, can be used to triangulate changes taking place in the larger economic context of the community.

4. Time periods

One of the problems in reapplying the North Slope Phase I methodology was in establishing the time periods over which change was to be measured. The wide variability in time spans (of 1-, 2-, 5-, and 10-year periods) over which secondary data were collected, the frequent absence of any specified period of change noted in written sources, and the general ambivalence in bracketing the periods of change made a strict category by category reapplication impossible.

Our solution to this problem was to use the relatively comprehensive 1982 Nuiqsut case study as a baseline data source. This study was prepared by Michael Galginaitis and Albert Dekin with the objective of providing the MMS with a set of assumptions for "monitoring trends in the sociocultural systems of North Slope villages." As demonstrated by the field summary, this approach proved very effective and is expected to be equally useful in St. Paul and Unalaska, though somewhat less useful in Sand Point, and relatively inapplicable in Atka. The Atka case is expected to reveal the problems inherent in developing the required data base or in reconstructing previous baseline conditions.

5. Timeliness of secondary data base

Timely access to secondary data is essential. A program monitoring change cannot rely on assessments of secondary data bases that are already two or three years, much less a decade, old. The integration of outdated population, employment, housing, ethnicity, morbidity or mortality data with current events would largely invalidate the analysis. A valid sociocultural monitoring program must be able to rely on secondary data bases that are sufficiently contemporary to support the monitoring objectives.

Changes occur in different social and cultural institutions at very different rates--some imperceptibly slow, some rapid and dramatic, and many in discontinuous thrusts. Particularly for isolated rural Native communities, some forms of secondary data are only generated once a decade (e.g., U. S. census data), while other data bases are available at the conclusion of each calendar

month (e.g., monthly clinic reports, council minutes), and still others on an irregular periodic basis (e.g., board meetings, special community events).

Some kinds of institutional change may allow frequent remote monitoring approaches, such as telephonic updates, while others may require far less frequent monitoring (e.g., changes in religious institutions). The monitoring requirements for each different institution will vary, and one of our objectives will be to determine reasonable data collection periods for each of the institutions selected for inclusion in the Aleutian-Pribilof region.

The availability of data operates on the analysis in other ways as well. There is a strong economic incentive to construct a monitoring methodology which concentrates on secondary sources and a tendency to use an indicator just because it is available. The value of this approach is that it offers a high level of inter-regional comparability. Such quantified data sources, however, suffer the inherent weakness of sometimes masking differences between populations, particularly sociocultural differences--a fact clearly recognized in previous MMS and BLM studies.

Monitoring requires the existence of an adequate data base. The quality of the monitoring effort, in turn, will depend on the quality of the primary data base (baseline studies) on community. The use of multiple sources (such as public safety records, clinic records, and council minutes) means that the records may not necessarily conform to specific time series, or consistent time periods (i.e., 1980-85). In addition, as mentioned above, different components of sociocultural change move at varying paces. Measurement instruments must be tailored to different categories of social change. Political change can occur rapidly and public safety indicators (such as crimes, call outs, and alcohol consumption) are also relatively responsive indicators of change. Health indicators are also sensitive though somewhat delayed in expression. Changes in educational objectives, achievement, and so on, are less responsive but are easily documented and are relatively objective indicators.

This brought us to the key question of "how well do the researcher's etic categories (i.e., external to the local culture) reflect the reality of change as perceived by local participants?" Do changes in the selected issues correspond to changes sensed by residents as "significant?" Our subjective appraisal, based on a relatively small number of informant discussions, was that the changes we were looking at in Nuiqsut were either already regarded as "significant" or were quickly recognized as appropriate measures of change. Responses, however, to our questions regarding changes in the "whaling complex" were often met with confusion and this issue is discussed independently below.

The currency of data sources was, and invariably will be, a problem. Put a different way, to many residents "1984 was a long time ago." One of the most difficult of phenomena for us to deal with in Nuiqsut (and perhaps for cultural anthropologists to deal with at all) is the fact that the people under study live in the present, and do not live their lives with reference to a mystical and romantic Inupiat past. This was nowhere more evident than in our attempt to examine changes in the "Whaling Complex" in Nuiqsut. Our findings, it is true, are biased by the fact that the initial ethnographic work done in Nuiqsut by Galginaitis et al. in 1982 dealt only in passing with whaling activity . This means that the available data base on perceptions of the cultural complex organized around whaling and whaling values was therefore very limited (we were

forced to reconstruct the baseline values and to contrast this reconstructed model with contemporary attitudes).

In essence, we asked experienced whalers living in Nuiqsut what they felt were the significant changes that have taken place in whaling over the last "five years or so." We soon recognized that "five years or so" could mean as much as fifteen years and that some of our informants had not whaled in over five years. As is frequently the case, the captains and crewmen with whom we spoke had very strongly held opinions regarding the changes that have taken place both in the actual physical pursuit of the whales and on the changes that have taken place in those values around which the "Whaling Complex" is constructed. Opinions ranged from "it's the same as it always was" to "there are so many more crews out there now" to "It's more of a sport today, everything is 'I gain', 'I gain'" to "...so whaling doesn't have its survival value anymore, now we are getting along without the whale, before it was necessary to survive."

At both the individual and community level, our informants in Nuiqsut consistently emphasized that "things have changed very much since 1980" and almost as frequently remarked that things have changed a great deal in just the last year or two. It is important to be alert, then, to the fact that things that happened just last year are often perceived as remote events when compared with "who" the individual is today and "what" his interests and community roles are today. An informant might be mayor today after having been unemployed for years, or vice versa. Thus, some understanding of the individual's place in the social structure of the community must be gained before the researcher will be able to interpret his or her comments from the perspective of his research objectives.

6. Timing of Field Work

The timing of the research period is important. The researchers must be familiar with the cycles of community life to enable them to fit their observations into the yearly round and compensate for artifacts produced as a function of the specific period of their observation. Given recent economic events affecting the entire region, it is expected that the effects of the Capital Improvement Project (CIP) downturn will only begin to be perceived sometime this coming summer. Periods of relative inactivity (i.e., "unemployment") during the winter months conform with the traditional pattern while such inactivity during the summer months is likely to be seen as a major "problem."

7. Limits on Field Time

Under the kind of research constraints to be imposed on future monitoring programs, there will be a minimum of time allowable for the fundamental field process of establishing rapport. Thus, it must be assumed that researchers will be familiar, to the extent possible, with the community before they engage in fieldwork. The period allowed to monitor changes cannot be sufficient to establish prior baseline conditions against which changes are to be measured. In no event should a researcher go into a community "cold." Valuable field time cannot be expended on discovering the basic structures of the community or in establishing the rapport that is essential to the successful conduct of sociocultural research.

These time constraints, and limits of the Phase I protocols, prompted us to attempt a rather innovative (at least for us) field data collection approach. We would take copies of the relevant sections of the original Nuiqsut case study to key informants and ask them to read, "correct" and/or update that particular section of the report. By enlisting the assistance of pertinent individuals (normally in official roles) to review and update the material directly (by marginalia, providing pertinent reports, minutes or records) allows them to select from their own understanding of the community data sources of relevance to that particular issue, concern or general trend. This approach worked so well that we intend to make it a standard field practice wherever possible (i.e., where multiple visits to the same community are scheduled). Since we plan to spend approximately one month in three of the Aleutian-Pribilof study communities this technique should work well, as thoroughgoing published data bases exist for each.

8. Institutional Clusters

We must be clear about what we mean by "institutional change." A formal voluntary organization (e.g., a Lion's Club) is a fairly obvious social group that is classified as an institution. Changes in this organization (leadership, participation levels, activities, etc.) can be accurately gauged and interpreted. For the most part, a community (by its very definition and size) is characterized by its set of intertwined and interrelated social organizations (institutions). Changes affecting key or core elements of an institution (or set of institutions) can be expected to affect other related institutions. Changes in marriage patterns, for example, will result in changes in family organization, visiting patterns, religious activities, employment relations, ethnic relations, and so on. Thus, indices that reflect changes that have affected or are affecting clusters of institutions (often functionally related) are far more powerful tools in the interpretation of change than are more detailed and specific indicators which support only micro interpretations of change.

One must be careful, however, in generalizing from such indices. Formal organizations, as such, especially in the communities to be examined in this study, are not commonly thought of as accurate initiators or reflectors of social change. Small rural communities are more often characterized by informal groups, modalities, kin groups, occupational groupings, and so on. Thus, we are not dealing so much with formal enrollments, leadership patterns and decision-making procedures as with social consensus, community prestige and status relationships. Within such informal structures, what may be a significant change within one such grouping may or may not indicate changes that are taking place in similar social groupings elsewhere in the community. It was evident that without the advantage of extensive previous experience in Nuiqsut (by Michael Galginaitis) the social cleavages that determine in large part the decision making process in the community would have been far more difficult to develop and verify. This is the kind of information that requires an openness and willingness to confide in the researcher that is difficult to establish within just a few days of research.

9. Housing

Except for the political and sociological import of the distribution of housing (the focus of the original North Slope consideration of housing), the utility of average household size, composition and geosocial distribution as indicators of social change, except as described in our summary, have been

undermined by the very rapid and aggressive sequence of housing construction in Nuiqsut. For other communities, however, these indices are expected to assist in the analysis of sociocultural change (where this kind of rapid construction process can be dismissed).

10. Integration of Quantitative and Qualitative data bases

It is useful to ask if we, on the basis of the field test, have come closer to answering the question "How are the quantitative indices to be integrated with the qualitative data base?" First, we must be clear about the ultimate objective of the methodology--to monitor sociocultural change. From this we know that the central element of the analysis will be changes in social organization and cultural values. Once this is recognized it is then also clear that economic and other quantitative indicators are to be employed to assist in the interpretation and understanding of qualitative changes in the community and not the other way around. This finding is not so much based on the field test as on our experience in trying to make sense of the secondary data base in view of what we know to be significant sociocultural changes taking place. It is certain that the secondary information available is incapable of telling us what happened in a particular community during a particular period of time without oour already knowing what major social or economic event occurred at that time and place. For example, the perceived severity of the social effects resulting from imposition of Limited Entry cannot be determined from any secondary data base available. The social disruption caused by indivisible wealth, the changes in distribution of social and political prestige resulting from dramatic economic changes, and so on, are incapable of being assessed by remote methods or by the analysis of secondary data bases.

This being the case, will it ever be possible to develop a remote sociocultural monitoring methodology based solely on secondary data bases? The answer to this question must be an unequivocal "no." Without a very clear and contemporary understanding of the social and cultural changes through which the community has passed, and is passing, the interpretation of the published or remotely gathered quantitative indicators will be flawed. While we can envision a time when the quasi-secondary data sources discussed above will be instantly and continually available via computer link-ups throughout the state (and Alaska will certainly be the first to try it), their interpretation will still have to rely on first-hand information of local cultural understandings and local conditions.

11. Methodological flexibility

A successful methodology will require sufficient flexibility to accommodate and accurately capture major unexpected changes in the economic, political or social context of the community. The effects of the withdrawal of the National Marine Fisheries Service in the Pribilofs (NMFS), the crab fishery decline in the Aleutians, and the CIP slow-down on the North Slope have resulted, or the case of the CIP will result, in major alterations in social, political and economic arrangements and will give rise to significant sociocultural consequences. The methodology must be sufficiently flexible to accommodate such rapidly occurring, and largely unanticipated, shifts in the environment. This is where the qualitative, on the spot, analysis becomes critical. It allows up-to-date analysis of effects, allows for utilization of local perspectives in interpreting the implications of the changes, allows the analysis to identify the

sequence of events that led to a particular set of consequences, assures a locally meaningful and useful analysis of the causes and consequences of particular events and, finally, it allows the analysis to anticipate problems and consequences.

The protocols to be designed for the Aleutian-Pribilof region must be capable of accommodating changes or new variables that emerge as significant. It is best not to assume, even after testing, that the variables selected are the most appropriate. New developments or external social or economic forces continually emerge as significant and are reacted to by the sociocultural system. Our approach must be capable. of capturing such changes and to do this the protocols must be sufficiently flexible. For example, the precipitous decline in CIP expenditures and employment is one such variable that was not anticipated in the North Slope methodology or analysis. How has this decline (when related to the equally precipitous initial burst of economic expenditures and local income) affected the community? Such profound, and discontinuous, kinds of externally induced changes are among the most difficult to assess (or plan for) and result in major perturbations in the analysis. The discontinuation of the fur seal harvests is a parallel kind of change in the Pribilof Islands. These kinds of changes, however, are a primary reason why monitoring sociocultural change is essential to effectively differentiating the effects of diverse forces of social change (including OCS leasing activity).

Our interview questions, for example, had to be adjusted to the level of expertise or experience of our informants. That is, new captains were asked questions regarding starting up, views on the importance of whaling, and their relationships to old captains, while well established captains were asked about changes in technology, and attitudes and values inherent in whaling. All captains and crewmen alike were queried about "meaning" attached to perceived changes.

12. Differentiation of causes and effects

It may not be possible to differentiate the effects of MMS lease sale activities from those of the state, the Bureau of Land Management, and, ultimately, from Borough and ASRC activities on the North Slope. Too much has already occurred to allow for accurate assessments of the incremental effects of federal OCS development in this region of Alaska.

Where such development is occurring, or is likely to occur, in the relative absence of other kinds of external development, the effects of OCS lease activities can be more fairly and accurately differentiated from other influences. This is clearly the case in Unalaska and in the Pribilof Islands. In St. Paul, just three to four years ago, the general (virtually unanimous) attitude toward virtually any kind of development (processing, fishing support base, OCS activities, etc.) was overtly hostile. With the withdrawal of NMFS subsidization, the primary source of employment and economic support for the community, the attitude has shifted markedly within a period of two or three years--this is a relatively radical change in political attitude toward development in general and toward OCS activities in particular. The same has been true in Unalaska.

13. Assumptions of future conditions

Finally, our assessment of change must entail some assumption of the "where will they be when" maxim. That is, our data collection objectives must

anticipate a very wide set of conditions in which the community may potentially find itself. The community context, when a particular change occurs, as seen in our previous studies, is often more important to community reaction than the structure of the change itself. We must not only look at the current adaptive responses but at mid-range and long-term adaptive consequences. For example, if the development under consideration is not expected to remain a viable component of the local social and economic environment, the negative short-term consequences of the development will be compounded by the effects of the abrupt withdrawal or closure of the facility. That is, if the community as a whole is successful in adapting to OCS-related local employment opportunities (especially to the point of economic dependence), only to have these activities abruptly eliminated, the cumulative effects of the development will have been significant, will have fallen disproportionately on local residents, and generate a second level of detrimental effects (such as outmigration, social disruptions, and political disruption.). On the other hand, what may seemingly be catastrophic immediate and short-term consequences (extraordinary increases in negative health indices, violence, alcoholism, law enforcement calls, and dramatic decline in perceived social well-being), may ultimately fall within "acceptable" limits if the development itself becomes an enduring component of community economic and social adaptation.

As illustrative examples consider the NMFS withdrawal from the Pribilofs and the very recent changes in CIP expenditures in the North Slope. After decades of very high subsidization of the fur seal harvest, the federal government determined that it was no longer politically or economically acceptable to continue the harvests. Full scale subsidy was discontinued several years ago. A temporary and token subsidization was continued, but this too was ultimately eliminated. This action not only left the community without its economic base but made it impossible to continue in the central organizing activity of the community--the fur seal harvests. The effects of this change have been dramatic and pervasive. With few economic alternatives, the political leadership of the community, reflecting the general anxiety of the population, elected to alter its attitude toward potential oil activities in their community, in fact, to reverse its official attitude toward outside activity in their community. Unalaska's response to oil-related activities within the context of the precipitous decline in the crab fishery was virtually identical.

The growth and decline of the CIP is another example of discontinuous change. Until the early 1970s the communities of the North Slope were among the most isolated on the continent. Average income was below $4,000 a year. With the discovery and ultimate extraction of oil and consequent rapid increase in revenue available to the region, the CIP was instituted and monetary incomes rose abruptly. After nearly a decade of such high earnings lifestyles have been altered. Material living conditions have been indelibly affected. The average home, for example, in Nuiqsut cost between $250,000 and $300,000 to construct. Fixed fuel costs are very high. Consumption patterns have succumbed to the influence of outside food products. The completion of many of the CIP projects and the perceived decline in available funding have led many residents to see an equally precipitous decline in jobs, income, and subsidization on the horizon. This atmosphere has created a situation in which the only apparent viable economic option, if current adaptive patterns are to be maintained, is to develop the mineral resources of region--engendering a subsequent series of detrimental sociocultural, political, and economic consequences.

These are the potential long-term effects which should, optimally, be anticipated in monitoring sociocultural change. If it can be determined that oil

development is certain to occur and will retain its influence in the community for a sufficient period to allow development of a permanent economic infrastructure, then the objective should be to make transition as low stress and effective as possible. It is probably a fair assumption that the more efficient the movement from traditional values and expectations to those necessary to accommodate imminent changes in the economic, social and political environment, the less stressful the change will be. If it is clear that the development will be transient in nature, that incumbent shifts in values will result only in subsequent dissatisfaction (i.e., maladaptation), then the cumulative effects must be seen as significantly worse than the "no development" or "permanent" development scenarios. Thus, assumptions regarding characteristics of the anticipated development will influence to a significant degree the design and implementation of a monitoring methodology. The variables to be employed are directly influenced by these assumptions.

It must be remembered that it is the pattern of the changes in the indices, not the indices viewed independently, which provides quantitative or "objective" measures. Such measures or patterns, in order to be usefully evaluated or analyzed, must be carefully set within the social and cultural context in which they occurred. The central question must be "what were the forces of change, the economic forces, political forces, social forces, etc. impinging on the system at the various points in the sequence of change and how are these reflected in the quantitative data base," not vice versa. That is, the quantitative data base cannot be interpreted independently of a thoroughgoing understanding of these social and economic events.

For example, for OCS development, we might see a rapid initial increase in local employment, household income, negative changes in physical and health indices, followed by a gradual leveling off of the economic and social stress indices during the course of development activities, followed finally by an equally rapid decline in income and increase in indicators of social malaise with termination of the development. Such a social profile might not be reflected at all in changes in, say, total population. Knowing the kinds of changes that are inherent to such development, the researcher will look at indicators such as sex ratio, age pyramids, entering kindergarten class sizes, Native/non-Native ratios, and so on, to establish a quantitative basis for his assessment of sociocultural change. Only field investigations, however, will allow the researcher to accurately interpret the data base.

14. Community size

Community size is seen as an important limiting factor to consider in the design of a monitoring program. The larger the community the more complex the sociocultural processes and more sophisticated or elaborate the measures needed to assess these processes. It may, in fact, be impossible to work at the level of "community" after a certain population level is reached. At a certain point, the community becomes a regional center and the measures of institutional change become muddled in considerations of still larger political, social and economic forces. At these higher levels socioeconomic models gain in value while the sociocultural models decline in importance. At populations levels below 500-700 the political and economic dynamics favor sociocultural interpretations. Interactions are of a face-to-face nature and the course of community change is charted more by social and cultural forces than by the more anonymous economic forces.

Moreover, each higher level of analysis is subject to greater and greater perturbations (i.e., increases in problems of validity/reliability). As community size increases, so does the number and complexity of organizations to be included in the analysis, the size and complexity of pertinent social institutions, and the number and intensity of socially differentiating factors. At still higher levels the problems resulting from intracommunity variation become important and the interrelatedness of communities within clusters becomes an empirical question.

The assumptions on which the sociocultural monitoring program must be based tend to support the following order of levels of reliability: first, small ethnically/economically homogeneous communities are most susceptible to the measurement of sociocultural change; second, larger ethnically homogeneous communities; third, homogeneous community clusters; fourth, small ethnically or economically mixed communities; fifth, homogeneous subregions; sixth, homogeneous regions; seventh, larger mixed communities; eighth, mixed community clusters; nineth, mixed subregions and, finally, mixed regional level analyses.

15. Ethnicity

As the number and relative population of different ethnic groups within a community increases, problems arise in the interpretation and analysis of "ethnicity." For example, when only a few Filipinos live and work in a community they can justifiably be treated as an “other” category in a population table, and as population increases slightly, they become an “enclave.” As their numbers increase further, however, they gradually become economically, socially, and, ultimately, politically “significant” and must be treated as a distinct social group. This is straightforward, but becomes problematic when that minority group assumes a very prominent economic and political role in the community, as non-Inupiat have in Barrow. Recognizing the emergence of economic class and stratification as a potentially profound effect of mineral or industrial development, how do we monitor social differentiation? From another perspective, we must recognize that preexisting social factors differentially predispose different social and economic groups to the effects of development-related employment and unemployment.

16. Economic base

Differences in the economic bases of the communities have major implications for the implementation of a sociocultural monitoring program. Communities such as King Cove and Akutan have been intimately linked to their local processing facilities, St. Paul and St. George are traditionally linked to the sealing industry, Unalaska to the crab fishery, Sand Point to a diversified fishery, and Cold Bay to government-sector and transportation employment, and each will be subject to differing kinds of sociocultural changes resulting from, ostensibly, the identical external factor (e.g., OCS development). Thus, the methodology must be capable of specifying the different kinds of variables that will be employed in each of the different preexisting social contexts, why they are expected to best reveal sociocultural changes in the community, and which aspects of the preexisting social context have influenced the selection of variables.

17. Political control

The North Slope sociocultural monitoring methodology appropriately concentrated its institutional analysis on formal and informal political organization. This was appropriate in this case because political control (through which economic changes have been initiated and managed) has been the dominant force of sociocultural change in the North Slope. It is clear that from the MMS perspective political control is of paramount concern. In the Aleutian-Pribilof region, as has been the case in the North Slope, current and future opposition to MMS activities will be channeled through existing or evolving political structures. Political institutions will also play a profound role in influencing local adaptation to these events. Thus, it is important that we monitor changes in political control. However, it should also be recognized that the events which channel political response in the first place are, in important ways, predetermined by social and cultural perceptions of reality and it is these perceptions which must change before changes in political control occur. In predicting that the residents of the city of Unalaska would ultimately encourage oil development in order to maintain their standard of living, we were simply recognizing that changes in attitudes would follow rapidly on the heels of unemployment, and that political responses would ultimately follow suit. An effective monitoring methodology, in other words, will not have to wait for changes in formal or even informal social organizations. It will anticipate these changes.

We should also add that variables which reflect differences in political organization are important indices of the flexibility of the community to react to or control externally imposed (or initiated) economic changes (i.e., development activities). The relationship, however, must be made clear since no single kind of political organization can be assumed to be superior in its ability to react to external change agents.

18. Multifaceted Change

We must be clear that social change is a complex, multifaceted process and that our models and analytic approaches are but heuristic devices. They are analytic devises only, our best appraisal of key indices of change. Our analytic conclusions will describe the pattern of change for the community as a whole while fully recognizing that many individual exceptions and variations exist. Where our analysis can demonstrate overlapping, mutually reinforcing tendencies such as negative indices of health, social welfare, and public control, our assessment will that much more reliable.

19. Focal social complex

The Phase I study identified the “whaling complex” as a central organizing theme on the North Slope. While the whaling complex itself cannot be found in communities of the Aleutian-Pribilof region, changes in what we are calling the “focal mode of production” or “focal social complex,” that is, a social institution or value system to which other social forms tend to conform, have occurred. In our view the whaling complex is seen to orient other social institutions, as a “lead” social form which “anticipates” subsequent changes. An analysis of this complex can accurately mirror recent changes and anticipate long-term change.

20. Social differentiation

The measures of social differentiation are powerful indicators of sociocultural change. Changes in the distribution of power, wealth, prestige, and so on, resulting from changes in the external environment are important, though difficult to analyze. The changing distribution of income (the number of residents below poverty levels versus the number of high and very high income earners) is another potentially valuable measure of sociocultural change. Such differences are readily perceived locally, and are often viewed as resulting from one or another externally induced change.

ATTACHMENT A

CHILKAT INSTITUTE MONITORING VARIABLES

Summary List of Variables

I. WHALING COMPLEX

A. continued significance of whaling status for leadership
B. development of specialized institutions for the regulation of harvest
C. effects of changing conditions (external regulation, economics) on participation in whaling
D. persistence of socialization processes into whaling complex
E. persistence of whaling ceremonials
F. continued participation of women (captain's wives, Mothers Club) in distribution of muktuk

II. FAMILY

A. significance of kinship in the distribution of political influence and in the conduct of key institutional roles
B. significance of kinship in gaining employment
C. structural changes in household composition
D. changes in traditional family institutions (extended family networke, vieiting, sharing, hunting and fishing groups)
E. persistence of family socialization roles
F. persistence of family values

III. LEADERSHIP

A. persistence of traditional affiliation (kinship, whaling) among leaders
B. recruitment and replacement of Inupiat leadership
C. political formation and the proliferation of specialized organizations and departments
D. influence of Inupiat in state political processes (legislature)

IV. OTHER CULTURAL INSTITUTIONS

A. persistence of participation in other cultural institutions (partnerships, namesakes, adoption)
B. persistence of Inupiat language

V. LAND AND SEA

A. growth of restrictions on traditional land and sea use by external agencies
B. development of local management organization and regulations
C. development of land-use planning and zoning
D. incidence of lawsuits
E. changes in land ownership and use
F. institutional response towards preservation of traditional land use and identity

VI. ECONOMIC DEVELOPMENT

A. local control authority over development activities
B. NSB influence on etate and federal development regulations
C. NSB taxation authority
D. local hire and contracting preference policies
E. distribution of Native corporations
F. Inupiat entrepreneurship and entrepreneurial values
G. changing values of youth
H. institutional development among voluntary organizations

VII. SOCIAL DIFFERENTIATION

A. population growth
B. increase in ethnic diversity
C. permanence of non-Inupiat population
D. institutional participation of non-Inupiat
E. differential participation of Inupiat men and women in economic and educational institutions

ATTACHMENT B

Theoretical criteria:

1. The accuracy of the cause-effect linkages established, or potentially established, by the methodology,

2. The validity of the findings resulting from application of the methodology.

3. The relevance of the findings to the examination of OCS-induced cultural change or in distinguishing between OCS- and non-OCS-induced change

4. The accuracy of the seven variables selected by the original research team (and corresponding subvariables) in demonstrating and measuring major trends

5. The degree of correspondence of the variables to culturally-constituted categories (i.e., local perceptions of change).

Methodological criteria:

1. Operationalization of variables.

2. Adequacy of protocols in obtaining measures of the variables.

3. Amenability of data to qualitative or quantitative analysis.

4. Replicability of the methodology.

5. Required expertise.

6. Data availability. Do the recommended data sources exist, are they accessible, and are they appropriate to the domain?

Pragmatic criteria:

1. cost.

2. Required training.

3. Utility.

ATTACHMENT C

We found it necessary to add variables under each domain or issue category considered to be essential to monitoring significant sociocultural change occurring in both Nuiqsut and in the Aleutian-Pribilof region. The focus of this study (and our experience in these communities) indicate the importance of measuring changes in health care organization and delivery systems, along with changes in educational systems, and assessments of changes in social differentiation. Health indices have long been considered important indicators of sociocultural change. While such indices would not be especially useful in the North Slope in differentiating changes due to several types of development, in the Aleutian-Pribilof area they are expected to provide very accurate measures of negative social change resulting from particular kinds of environmental change (e.g., the crab decline and NMFS withdrawal). Public safety indicators can also be useful in the assessment of change assuming the limitations on the data are well understood (i.e., the number of public safety personnel influence the number of arrests, prosecution rates are related to distance from service center, and so on). While we understand the reasons the original North Slope methodology so carefully avoids consideration of such indices as alcoholism, arrest and conviction rates, violent crimes, suicides, and so on, it is very clear that such statistics provide important clues to the course of sociocultural change within the community. They are valid and important means of measuring institutional change. The effect, from MMS perspective, of having these indicators of maladaptive change "discovered" at some later date will be to place the burden of responsibility for those changes on MMS (or related) forces, which would be both inaccurate and counterproductive.

The suggested alterations to the original five issues identified in the Phase I monitoring methodology are portrayed in outline form below.

A. Population/Demography (changes, implications, interpretations)
   1. Total population
   2. % Increase
   3. Native/Non-Native
   4. Ethnicity
   5. Household size (mean/mode/median and description of underlying causes and implications)
   6. Sex distribution (gender balance)
   7. Age distribution (pyramids)
   8. Geographic distribution/spatial distribution
   9. Housing
      a. family relationships
      b. economic well-being
      c. social stratification
      d. decision making criteria for housing assignment

B. Political Control
   1. Formal political organization
      a. evolution/emergence/diversification of organizations/institutions as "movers" of community
      b. changes in structure, personnel, objectives of

existing institutions
c. lines of cleavage (reflecting divergence of opinion, direction of change, economic interests)
d. forms of overlap in authority, areas of structural conflict/cooperation

2. Informal or quasi-political organization

C. Economic Organization
1. Employment
a. total permanent, male/female, age distribution
b. seasonality
c. sources

2. Transfer payments or in-kind subsidization (tied to social indicators) AFDC, food stamps, etc.

D. Health
1. Social welfare
a. Public Safety indices (destabilization/stabilization indicators)
1. arrest data (increase/decrease, by category)
a. felony (violent/non-violent)
b. misdemeanor (personal/property)
2. prosecution records
3. population/public safety personnel ratio
b. Social services (church, counseling, etc.)

2. Physical
a. Clinic data
1. visits
a. total number
b. frequency indicators
2. morbidity/mortality (categories)
b. Staffing (ratio to population)
c. Facilities (changes as reflection of institutional change)

E. Education
1. enrollment
2. discipline issues
3. standardized test scores (increases or decreases)
4. entering language facility
5. post-secondary education rate
6. role of institution in community (social integration of teachers and school activities)
7. assessment of school "morale"
8. facilities evaluation where appropriate

F. Social Differentiation

1. Income (distribution)
2. Material wealth (amassed net worth)
3. Political power (titled roles)
4. Prestige (whaling, valued traditional roles, etc.)
5. Formal education
6. Generational

In overview, no single index is expected to demonstrate a particular direction of sociocultural change, but in combination they should provide a defensible interpretation of the overall direction of sociocultural change.

APPENDIX "C"

PHASE H MONITORING METHODOLOGY

SOCIOCULTURAL MONITORING METHODOLOGY WORKSHOPS

Conducted for

THE U.S. DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

at

THE SHERATON HOTEL

ANCHORAGE, ALASKA

DECEMBER 16-17. 1985

by

IMPACT ASSESSMENT, INC.

APPENDIXC

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Phase II Monitoring Methodology

MONITORING METHODOLOGY:

ASSESSING INSTITUTIONAL CHANGE IN THE ALEUTIAN-PRIBILOF REGION

Introduction

The current phase of this MMS project is designed to look not at the effects of a single project, or lease sale event, but will take a cumulative perspective to assess institutional change, and through that sociocultural change, in the Aleutian-Pribilof region over the period 1980-1985. Formal institutional change is one of the least difficult kinds of sociocultural change to monitor and therefore has been the focus of much sociocultural research. Institutional changes are less subject to perturbations than are other cultural patterns and individual values and thus provide the most consistent and visible measures of incremental change over time. One of the more promising components of recent work on sociocultural monitoring methodology, with regard to institutional change, is the measurement of structural differentiation. One of the more clear, and inevitable, consequences of social and economic development is the accelerated pace by which new organizations, new leadership patterns, and inter-organizational links are formed. The number and complexity of these organizations, the rate at which they are formed, the intra-regional distribution of these institutions, and their access to resources all serve as proven indicators of institutional change (see Perry and Bauder, 1980:326-340). Data to assess this change during the 1980 to 1985 period are accessible and will be compared with current conditions and trends. Traditionally, institutional change is regarded as indicative of broader sociocultural change. This link, however, must also be established and described, and that is one of the major goals of this monitoring methodology. In particular, we will be sensitive to the relationship between traditional institutions and newly formed institutions and the significance of these relationships to sociocultural change.

The monitoring methodology to be used in the Aleutian-Pribilof region for this Phase II study is the product of several processes. We have endeavored to make this methodology as comparable as possible to the one developed for the Phase I study, but we have felt it necessary to make several modifications. In the Phase I study five issues were felt to be significant for monitoring institutional development and change. These were population, political control, wage employment and business development, housing, and land. We have modified these in that we do not feel that housing is a separate institutional category, but rather discuss it in conduction with other institutions, and we have added two other institutional categories: health and education. Further modifications were made as a result of (1) refinements developed during our Nuiqsut field test and (2) the suggestions of the various participants of the workshops which were held under the provisions of this contract. For a full treatment of our modifications, and to keep this document as succinct as possible, the reader is referred to other documents completed by the research team, including the summary of the Nuiqsut fieldwork, the Nuiqsut fieldwork evaluation, proceedings of the workshops, summary of the workshops, and finally the Aleutian-Pribilof fieldwork plan and literature review. This document, Technical Memorandum SCM-4, and Technical Memorandum SCM-3 should be taken together as a set as they are to be simultaneously applied in the field.

There are several processes of sociocultural change that we will be seeking to illuminate through this institutional monitoring methodology. First is linearization. As societies become more complex (that is, they come to be made up of more parts) the decision-making process tends to move upward in the social hierarchy as lower-order controls are routinely bypassed in favor of higher-order controls. Second is centralization. This is where control over resources becomes focussed in a smaller group of actors. Third is formalization, where loose social groups become formal organizations with an agreed-upon charter. Fourth is promotion, where a group with control over a resource which increases in value comes to have increased power within the community. Fifth is social stratification, where the society becomes more stratified as power becomes unevenly distributed. Sixth is social differentiation, where new organizational forms create new statuses for individuals, and thus new roles for those individuals, changing their relationship to the rest of the social system.

Protocol Design

This monitoring methodology is arranged in the form of protocols. The intent of this protocol construction is to assist in the standardization of the data collection approach and to assist in the analysis of the data by triangulating data on issues of importance. A protocol is quite different from a questionnaire. Questionnaires generate a quantifiable data base which, however, allow only a very narrow understanding of specific aspects of current conditions or change. Protocols, on the other hand, are not expected to be rigidly adhered to or utilized in the manner of a questionnaire, but rather are intended to serve as guides which guarantee an acceptable minimum standardization of a data collection. They are intended to assure a sufficient level of continuity between researchers and sufficient analytic comparability for the purposes of the study.

Since a protocol generates a much wider range of informant responses, requires a far greater latitude of interpretation, and necessitates a higher level of generalization, the analytic objectives of each protocol must be clearly understood and carefully evaluated. A protocol is not intended to be merely a general data collection instrument. Each question should have a clearly defined rationale and be independently defensible as an important area of inquiry. For this reason, we have endeavored to develop both a set of standardized data categories as well as a category-by-category explanation of the reasons behind the question and the analytic conclusions we hope to be able to make on the basis of answers to these questions (or interpretations of information concerned with each data category).

We must remember that in order for any specific index of change to demonstrably useful, we must first have a very clear understanding of (1) the social and cultural "history" of the community (i.e., the setting or context), (2) the component elements of the indicator and, (3) how that indicator is related to other indicators. Again, the analyst must constantly be reminded that virtually every indicator is related to every other indicator either directly or indirectly and that the "reality" of social change is multifaceted and interpenetrating--that what we are always dealing with is our own qualitative abstractions and analytic categories.

"In our opinion, the analyst need not have some special talent in order to understand and interpret the meaning of the data if they are appropriately organized and presented. The reason for this is the fact that "significant"

changes are overdetermined. That is, what makes a change significant is the fact that it is reflected in a multitude of sociocultural institutions or appears at multiple analytic levels. By the same token, a significant force of change is expected to be evident in clusters of related institutions.

The analyst should recognize that the pace of change among rural Alaskan communities over the last decade has been unprecedented. The indigenous population, moreover, has had to accommodate the generalized and pervasive changes in the Alaskan economy, as well as the enormous social and cultural gap between their society and the dominant society. To this must be added the recent reduction of the physical barriers that had previously acted to insulate rural isolated communities from the dominant Western system of values, beliefs and attitudes. The bridging action between cultural institutions has occurred at such a staggering rate, with so many overlapping causes and feedback effects, and with so complex a result, that the problems involved in separating out a particular cause of a particular effect have become imposing in the present, if not impossible to do in retrospect.

Credit, however, can be assigned to particular causes where the consequences can be clearly related (or in which a dominant role can be clearly delineated). On the other hand, causes of change in Alaska are often inseparable in their effects. That is, several external (environmental) changes can have highly overlapping, often indistinguishable, effects. State and federal subsidization policies, U.S. tax laws, inflation, and so on, all contribute to an increasing monetization of rural Alaskan economic organization and to the societal changes inherent in the monetization of values.

The following protocols reflect the methodology that we will be utilizing in our analysis of institutional change in the Aleutian-Pribilof region.

Population

Total Population: Beyond the gross percentage of population change, one of the population factors that must be differentiated is residency, with particular attention to local perceptions of residency. Does "resident" actually mean "permanent" resident? From a sociological perspective, the percentage of the imputed increase in population that is really "permanent" is the critical issue. Many new residents of communities undergoing resource development are unambiguously temporary, and related directly or indirectly to resource development activities. Other important factors focus on the (probably) disproportionate role of these new and temporary residents in the economic (monetary), political, and social organization of the community. This segment of the population will also react differentially to changes in the ecomonic environment, and this must be addressed in the question of effects of development levels.

Population and **Ethnicity:** The research must be sensitive to the implications of the non-Native/Native population cohort distribution, along with other salient social distinctions, and the relation of this distribution to other social and economic variables. These relations are very powerful indicators of change. For example, what are the implication of an increased population and a decreased percentage of Native residents in terms of political representation or in terms of employment and economic opportunity? In terms of formal educational objectives? In terms of changes in the tax rates and bases, who are the

beneficiaries of immediate expenditures on capital improvements, and who will bear the long-term costs? Interpretations of change must be sensitive to that point where the non-indigenous population becomes the numerically superior population. How are we to analytically and methodologically treat an indigenous long-term local population that has become a distinct minority in their own community? Secondary complexities are introduced when there are more than two major ethnic groups in the community, that is, when the non-Native group becomes significantly differentiated as, for example, during the crab "boom" period in Unalaska when the "other" ethnic category ranked as the second largest ethnic group in Unalaska. The analyst must ultimately confront the fact that the bulk of these (originally) non-local individuals will depart the community at the point where aggressive economic development begins to slacken. Such analytic problems, in essence, require rather complex sets of assumptions regarding future events and conditions (against which the effects of imminent events are to be assessed). Another important aspect of population change to be monitored, beyond the ethnicity of the new population component, is the degree of interaction between the old and the new residents. It is the case in many rural Alaskan communities that the new "residents" directly associated with the development live in an enclave environment and have little direct contact with the indigenous population. Characterization of this interaction has direct relevance for the analysis of sociocultural change generated by this new population, but it must be recognized that there are often others who move to the community who are only indirectly involved with the development. These are individuals who are not employed by the developer (for example, ARCO) but move to the community to take advantage of the commercial opportunities offered by the presence of the main development. These people, as individuals and as a group, are likely to influence the direction of sociocultural change in the community, and the effects of their presence will require fieldwork to assess.

Population and Economics: Economic statistics are of the highest utility in measuring sociocultural change when combined with demographic data. For example, it is difficult to ascertain the meaning of an increased average income index for a community. What does the index really mean if we look at how employment is distributed within the community? In terms of relative income, have the indigenous residents shared equally in the increases or has their relative status actually declined as the new-resident population cohort assumes a dramatically disproporationate number of the higher paying jobs? If the relative income of the long-term residents has actually declined dramatically in comparison with the incoming resident's income, this may serve to create a distinct skew in social and economic status along ethnic lines--even though "average income levels" have increased significantly. Such an analysis can be substantially enhanced by utilizing additional Native/non-Native indices of income, employment, and so on, in combination with seasonal employment patterns and demographic indices.

Demographics and Household Size: Household size has been one of the standbys of social and economic analysis of rural Alaskan Native communities, because, in part, households are the intersection of demographic, economic, social, infrastructural, geosocial, and kinship data. Unfortunately, the bursts of state and federally funded housing and construction activities have largely undermined the utility of this index of change at least with respect to long-term trends. During the pre-HUD period changes in household size, the frequency of nuclear families, and so on, were used with some confidence in portraying changes in community organization and structure. This is no longer the case. From one year to the next a particular community may increase its housing stock by 20-30% with an obvious effect on household size. Today, for the most part, availability

of housing is the dominant factor in determining household size as the moment a new subsidized house is available it will be occupied by a new nuclear family (or a least free up one house which will ultimately mean nuclearization of a larger family). It is important to note that patterns of housing may also reflect social stratification and family relations. When discussing household structure then, the housing environment must be carefully integrated into the analysis. The selection criteria for who gets which of the new houses, if a new house at all, is reflective of other social processes within the community, and needs to be investigated as well. Also included in" this portion of the analysis is data on geographic/ spatial distribution of the population outside of households. It is significant, of course, to note whether or not the incoming population is housed in bunkhouse- or enclave-style environments, and correlate these data with other social data to determine the influence of this group on the community. Housing vacancy data, an historically anomolous variable in itself, is also indicative of important social processes, and will be analyzed.

Population and Age/Sex Distribution: Critical to the understanding of population dynamics is the distribution of the population by age and sex (gender balance). Indices of change in the proportion of males to females, when combined with the population and age pyramids, allow the analyst to accurately chart the age and sex composition of the emigrant and indigenous populations, which are often strikingly different. Significant increases in the male 20-40 year-old portion of the pyramid corresponding to growth spurts in a development phase can be used to support the observation that the bulk of the increased population are working-aged males. This, combined with the indication that the corresponding categories of non-Native women and children have also increased, though to a lesser extent, would provide statistical support for the observation that the bulk of the emigrant population is development-related and are likely to remain only as long as the development activities themselves. It can be anticipated with some degree confidence that these males, females and children will not become permanent residents of the community, though there will be predictable, and enduring, influences of this population on the schools and other aspects of community political and social life, as well as infrastructural and economic dimensions. We can estimate fertility (with the addition of marital status and sex ratio figures) for recent years and project changes under various assumptions of future development scenarios. School enrollments can be effectively anticipated, the number of fertile women indicates potential natural increase, the number of elderly residents an index of social stability and continuity, the number of working age males (indigenous) versus employment positions provides an index of absolute unemployment rates (though not actual ratio of employable to unemployable), the potential community workforce in relation to potential development activities. Even larger numbers of males, without a corresponding increase in the number of females, will also mean an increase in the number and kinds of predominantly male-client enterprises and activities that develop in the community--an additional bar or two, a pool hall or game room (video arcades) --but at a minimum it will mean a significant increase in utilization of such existing facilities. The increased number of males will also mean increased hunting, camping, off-road vehicle use, and other predominantly male resource utilization activities. It will also be significant to assess marriage rates, as fundamental change at the family/household level will be generated by outsiders marrying into the indigenous population or vice versa.

Population Size and Economic Change: It is important not to overlook the potential contributions to social change that may be made by a single individual, or small group of individuals, in the research community. There are

many cases in rural Alaska where a single entreprenuer has brought a 'commercial economy' to the community. The actions of such 'activists' are still evident in contemporary rural Alaska, and the effects of the actions of these individuals must be differentiated from actions undertaken by local residents. If the analysis is cognizant of the potentially profound influence (and regional historical examples) of a single ardent advocate within a community of politically inactive (when compared with the more active or 'confrontational' style of Western political systems) residents, then the potential sociocultural changes generated by an influx of 50 or 100 (or many more) non-Native, OCS-related, residents in a community the size of St. Paul (population -500) can be better assessed. Depending on the way in which these new residents interact with the existing community, such an abrupt change in the social and political composition of the community could have marked effects on local residents, even in excess of those which occurred in Valdez, for example. This is the case because most of the communities in the Aleutian-Pribilof region that would be subject to such population shifts resulting from OCS activities are largely non-Western communities and are therefore more vulnerable to major negative sociocultural consequences.

Community Size and Introduced Political Change: Community size is critical in assessing political change in response to external stimuli. Unlike larger communities in which political decision-making is more formalized and controlled by an array of elected representatives, rural Alaskan communities are susceptible to changes generated by a very narrow range of particularly ardent or powerful individuals. Such ardent individuals, in fact, often begin their political activity as outsiders--either as locals who have gone to the lower-48 for a college education or business activities and returned to assume an activist position among the political elite, or as non-Natives who arrive in the community, recognize a need for and the absense of political leadership and take control of the situation. There are also, less commonly however, "political activist" individuals who are intent on bringing positive change to the "less fortunate" and succeed in generating highly accelerated social change single-handedly. An extreme example of this process can be seen in the case of Levelock (a Bristol Bay community) where a single individual, who entered the community as a Vista volunteer "administrative assistant," over a period of several years worked himself into the region's most authoritative and successful grant writer and radically (and permanently) changed the physical and economic organization of the community. It is important to the monitoring of sociocultural change that this process be recognized and described in our institutional analysis.

Population and Land: The size of the population of a community has a direct bearing on the degree of control they are able to assert over the land in and around the community. Control of land in and around the community is considered important in the assessment of sociocultural change, as elaborated below, and population affects this in two major ways in the Aleutian-Pribilof region. First is the size of the Native population of the individual communities. The size of the Native population determined the amount of land that the local Native corporations were entitled to under the auspices of the Alaska Native Claims Settlement Act, and once this land was transferred to the corporation local control was assured, at least for the short-term. In some of the communities this meant control of virtually all of the usable land in and around the community. Second, the larger the population of a community, the larger the political clout the community carries, especially for state projects. This political clout is also important in getting the state to intercede on behalf of the community in

dealings with commercial concerns that are interested in land (and other resources) around the communities.

Land

Spatial Organization Within the Community: The spatial organization of a community has often been used in anthropology as an indicator of (or, more accurately, as a heuristic device to elicit) aspects of social organization. Changes in the spatial organization of the community were often seen to point to changes in social organization. Until the late 1970s the physical layout of most small Alaska Native communities could be used to support discussions of long-term trends (and equilibrium states) of social and political organization. Often communities consisted of a collection of rudimentary structures located without respect to property lines--with literally no consideration for land ownership--since few, if any, residents owned land. (Common exceptions to this pattern would be school or church lands.) Thus, dwellings were geographically distributed in the community purely along lines of social preference (obviously tempered by at least a minimum of consideration for the livability of the immediate environment) and often built in ways that reflected the material values or means of its owners. This is no longer the case, or at least it is no longer the case to anywhere near the same degree. The availability of federal and state sponsored or subsidized housing created a dramatic increase in the quantity and quality of available housing units in virtually every rural Native community of Alaska. These new dwellings are built on surveyed land, are physically identical to one another, are most often layed out in standard grid fashion in order facilitate telephone, electrical and plumbing installation and to reduce the extremely high cost of such construction in remote and often difficult locations. The procedure for assigning particular occupants to a particular house is important to assess. The procedure is sometimes political, but more often determined by some form of random drawing or lottery from a pool of applicants or qualified families. Even where these procedures have been undermined in favor of the political or economic benefit of a particular group or family, the results still do not lend themselves to statistical analysis. Housing variables that have proven to be useful, however, include the number, quality (a relatively subjective perception) and date of construction of privately built homes, occupation maps designed to show the sequence of government-sponsored housing construction and relative quality of available housing, and occupancy tables showing vacancies over the last five years. These different measures can be used in a multitude of ways. When used in conjunction with the ordering and selection criteria for occupancy, they help to show the distribution within the community of different economic or possible social classes or groups (if this is supported other field data), and thus will assist in the interpretation of social and economic differentiation. These tables will also assist in the assessment of the relative level of commitment of different residence groups to the community. Those who have constructed their own homes, typically at high cost, can be expected to be more long-term members of the community, to assume a much greater role in community decision making, to be more conscious of the longer-term implications of external events, and to be more closely attuned to changes in community organization. Geosocial maps will also allow the analyst to see where people are located with respect to other variables as well. For example, in Native communities seeing whether non-Natives (typically teachers, at the minimum) are located in a specific and narrowly circumscribed area, such as adjacent to the school or on the periphery of the community, will suggest something very different from a distribution in which non-Natives are widely dispersed throughout the community.

Land Outside of Densely Populated Areas: One of the issues that came out most strongly in the workshops was the importance of continued access to the land (and the sea) outside of the community itself. Continued access to productive land and the wildlife and other natural resources on that land is seen as necessary for the continued vitality of the community, and this access is seen as interrelated to notions of well-being, values, the kinship system and other aspects of community organization. Access to land is seen as vital in keeping the culture and the community alive in that particular location. By "access," however, we are not refering merely to physical, legal or actual access but to the multitude of culturally important cognitive and affective uses of the land as well. For example, the residents of the community of Nuiqsut have traditionally hunted in the area now regarded as the Kuparuk and Prudhoe Bay oil fields. From the perspective of the oil firms this traditional access has been maintained. These firms claim that no restrictions have been placed on Native hunters pursuing moose or caribou in their traditional hunting areas. While it is true that local residents understand that there is no legal proscription against hunting in these areas, and while they recognize that an abundance of moose and caribou continue to be present, they nevertheless refuse to hunt there. Their reasoning is that they "feel uncomfortable" hunting in the vicinity of the oil drilling equipment, near the latticework of connecting roads, or where "there might be other people." Thus, the contorted shape of the Nuiqsut land use and hunting territory is more a function of emotional preferences and personal values than of externally imposed legal restrictions. Given the effective limits on land access and use resulting from such social and psychological causes it is important to recognize and assign appropriate weight to these factors in our analysis.

Political Control and Social Complexity

Political Autonomy and Local Government Structure: The communities of the region have several different government and quasi-governmental structures that they can utilize in an attempt to retain or regain a measure of local autonomy. For example, a community can form a village council under the provisions of an IRA government, or communities in the region may elect to form a subregional or regional-level governmental entity. Changes, whether actual or merely debated, in governmental forms will be monitored and analyzed for their structural components and their relationship to outside forces.

Politics and the Process of Formalization: During institutional formation and differentiation, each of a community's formal institutions pass through roughly the same developmental sequence, and when monitoring institutional change it is important to represent the institution along this continuum. This process entails an increasingly strict adherence to established precedents, an increasing complexity of rules and regulations, and an increasingly narrow definition of organizational roles and obligations. The size, economic support, and community significance of any one organization plays a large role in determining the effect these processes will have on the organization and on the community, but in general, these processes occur in a relatively predictable order in a 'development' situation and with similar effects regardless of the objectives of the organization. Thus, we may be able to measure or assess change that occurs in a particular institutional complex by comparing the complexity and level of elaboration of organizational roles, structures or procedures between two points in time. For example, we may compare the organization of an individual formal social/civic organization, such as a Lion's Club, which formed and matured as a

prominent component of social life in a particular community, fissioned into two independent (and in some ways conflicting) social organizations, and ultimately went inactive while its competing organization became a prominent feature of the social organization of the community. This process reveals much about social change in the community. The formation of the club was a formalization of existing informal social ties, and the club usurped some of the social functions of less formal structures. The core concerns, or preexisting social differences, that resulted in the fissioning, the central players in schism and the external events that precipitated the fission will all be evident upon analysis of the history of the process.

The formation of a new organization in a community is one of the best indicators of institutional change. It indicates, first, that the existing set of organizations in the community did not have the capacity to meet a newly perceived need. The social composition of the newly formed organization, in turn, is a material indication of significant cleavages or socially differentiating factors within the community. The structure of the organization is indicative of whether this was an introduced or indigenous (if dormant) organization; the formulation of a new set of relationships or the reformulation or recasting of old relationships. The focal objectives of the organization, in turn, reflect the unifying basis for participation--that is, the membership of a predominantly economic organization will reflect economic similarities between its members, political organizations will reflect political similarities, and social organizations will reflect social similarities. This process, though rather obvious, has important implications for the analysis of institutional change in the Aleutian-Pribilofs. In the changes that take place among the established organizations and in the formation of newer organizations we can see what features of the wider social organization of the community are changing. The fact that such social changes commonly occur on several levels and are reflected in a diverse range of social phenomena allows the researcher to validate his or her findings by multiple triangulation. The interrelatedness and interdependency of social change make it possible to verify the occurrence of higher order processes, such as centralization or linearization. Understanding change at this level allows the analyst to discuss the meaning or implication of changes that have taken place on a multitude of levels within the community.

It is not always the case that organizations become increasingly more visable. After a certain point in the development process organizations may become inactive, shift their goals or stance, or simply become quiessent. When this happens it becomes difficult to measure institutional change. This fact, in and of itself, however, is indicative of an important social phenomena--the stable (or inactive) stage of activity. A Lion's Club that fails to meet for a period of six or seven months, for example, might technically be considered moribund. On the other hand, a significant change in the environment may prompt a special meeting of this group intended to deal explicitly with this outside agent of change. What we know about these periods of inactivity or relative routinization of activity is that the function for which the organization was formed is either no longer necessary or is being filled more effectively by an alternative organization.

Politics and Political Issues: It is important to monitor issues that are the subject of disagreement at political forums. It is at these times, such as during a city council meeting, where individuals and groups are most likely to publicly debate issues, and the researcher can begin to get a grasp of some of the major schisms in the community. It is important to stress that some of the

groups, and the issues which they feel most strongly about, are not evident in the short-run. At any one meeting there is always the possibility that there will be no issues of strong concern to be debated, but with a familiarity with the community and the 'players' the researcher can begin to sort out the most significant groups. The issues will also begin to resolve themselves into clusters, with ideological and personnel consistencies becoming evident as well. It is at this point as well that some of the institutional structural inconsistencies or conflict, which are the most common areas of public friction in times of change, become evident as people do not get the type of satisfaction they want from public institutions, or when private institutions are working at cross-purposes and have yet to reach equilibrium. It is important to note, for example, the priorities of the city council, and compare the priorities of those of the recent and distant past, and assess how and why these have changed. It is important to understand which of the priorities are controversial as well, and why they are controversial.

Beyond counting organizations within the community and noting the processes of formalization and specialization, the researcher needs to develop a scheme of distribution by function, such as school, health, social welfare, political, and so on, and the history of these organizations. In this way the researcher will begin to get a handle on the changes in the perceived needs of the community by noting periods of appearance of new institutions and changes in existing institutions. In addition, an overall evolution of institutions may be charted to allow the researcher to analyze the extent to which newer organizations subvert, replace, conflict with, or add hitherto non-existent objectives to, the existing organizational structure of the community.

Specific information on the organizations of the community would include collection of information on the leadership structure of the organization (autocratic/democratic/consensus), political schisms (bases, intensity, and observed effects), and participation rates (attendance levels and frequency of meetings) in order to assess the macroevolution of community organization and microevolution on the individual organizational level. In both of these processes, the general trend of organizations is toward increased formalization and complexity. This may be documented by agendas of the organization's meetings, replacement of volunteer with paid staff, formal definition of organizational objectives, and so on. It is important to note also the changes in the fiscal organization and the base of operation of the organization in question over time, as these will point toward changes in organizational structure. Informal or quasi-political organizations will be tracked as well. Informal organizations and modalities will be detailed so that their evolution may be charted, and organizations that are not formally political but have political functions will be detailed. Often these organizations or groups are on the cutting edge of social change, with relatively short response times in reacting to changes in the social environment.

Political Control and the Demographics of In-Migration: One of the issues of the nature of local control with which rural Alaskan communities deal in times of intensive resource development is the fact that with development comes the emigration of a relatively large number of outside individuals into a small population. These individuals are often politically active, have high expectations, and demand facilities and services to which they are accustomed. Based on the political prominence of their numbers, these individuals are in a position to indebt, in the long-term, the future permanent residents of the community in order to supply their own, relatively short-term, needs. Such a

process then sets in motion a series of community structural changes which are relatively impervious to subsequent social and political pressures to change (i.e., reversion to previous political and social organization). This situation has importantly different consequences for the community when compared with development situations in which the workers tend to remain in the community (i.e., situations of 'legitimate' local economic development) since the likelihood of these skilled and semi-skilled individuals and families establishing permanent residence in the community is remote. Paradoxically perhaps, they have an even greater impact on local political, social and economic processes in Native communities than their numbers would imply when compared with other remote Western communities. It is also the case that their influence on the community will be more profound, at least in structural terms, than if they were more permanent residents and had to themselves consider the long-term consequences and bear the burden of their political and fiscal actions. Their influence may be seen in a number of social forms outside of the formal political structure of the community as well, such as in religious, civic, and business organizations.

Political Hierarchy and Sociocultural Change: Today, unlike in traditional times, it is clear that political power in the communities of this region is organized primarily around achieved status (i.e., demonstrated competence). One of the prominent features of the formal political systems in the region, however, is the relatively small number of individuals that come to hold titled positions in the political hierarchy. Another way of stating this is that the number of individuals who hold multiple positions in the political organization of these communities is relatively large. The implications of such a concentration of power in the hands of a relatively small political elite are significant, and worth assessing for their role in guiding, accelerating, or decelerating sociocultural change. At larger population levels an analyst can be fairly confident that his assessments of political continuity and the direction of political change will hold, at least for the short-term future. However, at lower population levels, relatively minute changes in the political leadership of the community can initiate marked changes in the course of community decision-making. St. Paul is a classic example of this process--where strident political opposition to all development activities in the community was abruptly reversed as a result (in part) of a relatively minor change in political leadership. There are several ways to go about characterizing the changes in the political arena of a community. One of the places to start is to list the political positions in the community, the age of the position itself, and the current office-holders and the length of their tenure, along with the general trend of the tenure of the holders of that position. Other positions that are not formally political, but which have political overtones, should be included as well, including civic and service organizations and other public social bodies. Activity levels of these groups can be garnered from records of meetings.

Social Complexity and Religious Organizations: Religious organizations are potentially good indicators of increasing social complexity of a community, for several reasons. A critical mass of followers must be established in order to have a viable congregation for church services to be held. These congregations represent either a rejection of previous religious forms of the community, and the social groups which are associated with them (at least to some degree), or the addition of a new group individuals to the community. It may be the case that members of a relatively new congregation came to the community for diverse and unrelated reasons and coalesced into a new congregation on-site, but it is often the case that members of a congregation will have come to a community through communication with an information network of friends and/or relatives among a core

congregation. Of course, in actual cases, there is often a combination of these two processes as a core congregation moves into the community more-or-less as a unit and then attracts converts within the community who, for whatever reasons, find the previous indigenous forms less attractive than the new sect. In any case, the emergence and existence of new religious institutions is indicative of social complexity and a diversity of social groups. To form a new congregation there must be (at least a small) pool of available individuals, and often these individuals come into the community in response to economic opportunities provided by development. The lines of social cleavage that are visable in the differences in membership of religious organizations are normally indicative of other social and orientation differences that are more subtle and difficult to observe, but may be tracked down utilizing the congregational alignments as a heuristic device.

Economic Organization

Economics and Fiscal Priorities: An institutional level analysis of a community's economic organization is particularly illuminating of social change in several ways. First, the fiscal organization of the community, as reflected in the sets of priorities, along with recent and long-term objectives revealed in the history of a community's budget making process, provide very useful and durable indices of institutional change. The fact that succeeding community budgets reflect an increased emphasis on particular kinds of change, for example an emphasis on upgrading public transportation facilities to facilitate outside commercial access to the community, is an important gauge of community-wide sentiment toward that kind of development. Often the minutes of city council meetings will contain the respective differences of opinion on such issues, and the social alignments on selected issues may be tracked and correlated with social forces active on other development issues. In long-term evaluations of trends of change, the historic balance between social services, economic development, and physical facilities construction when tied to population changes, leadership changes, and prevailing economic conditions is a profound indicator of changes in sociocultural values and of institutional change. Also informative to a monitoring program is the pattern of fiscal expenditures on public buildings and places. The researcher can detail the number and types of physical structures in the community, the number and type of public facilities and public places, and then correlate these with the uses to which they are put. These will overlap with social groups and social activities, and changes in public and private structure may be indicative of social change if triangulated with other data. For example, the construction of a community center indicates a perceived need on the part of the community that is not being met by present facilties. It is important to know why this is the case, the groups who are backing the center, which groups it is designed for, and so on. In this way, physical (and obvious) structures are used as unobtrusive means of monitoring sociocultural changes at the community level.

Economics and Community Indebtedness: Another, perhaps even more useful and durable long-term index of economic change is the structure and organization of community indebtedness. Once a community has passed the enabling legislation, and bonding efforts are successful, the community has incurred an enduring debt. Changes in the level of indebtedness, the kinds of material developments funded by such indebtedness, and the local sponsors/advocates of such development, are all important and useful indices of institutional changes occurring in the community. In addition to the list of priorities gathered from the city records, indebtedness indicates, in dollar amounts, the priorities of the community. It would be a mistake, however, to assume absolutely that the members of the community recognize

the long-term implications and consequences of their bonding policies. In general, it is our observation that many of the voters/residents of rural Alaskan communities have little understanding of the long-term ramifications of community borrowing policy. In fact, there is a prevalent sense that such borrowing is really a pretty good idea since no one 'actually' pays--in a sense, people see only the benefits of the bonding and cannot see the long-term costs as something they will ever have to deal with (not unlike the prevailing attitude toward federal borrowing and its effects on our children). It is important that field data be collected, not only on dollar amounts of indebtedness, but on the historical events which preceding it and subsequent attitudes regarding its utility.

Indebtedness and Residence: For those who do have a strongly held perception of the costs and benefits of indebtedness, it is our experience that residents can often be divided according to length of residence (and sometimes by anticipated residence duration). This probably is accounted for by the fact that longer-term residents were present when the community was smaller and the population was deciding whether or not they would indebt 'themselves.' This is an important distinction since those residents were well aware of their own long-term obligation to repay the 'borrowed' money. Recent arrivals to a community, particularly resource-related immigrants and their families, envision a relatively fixed period of residence in the community and have substantial incentive to make immediate improvements in educational and public service facilities. These are funded over little or no resistance to increasing the long-term economic costs, which will be disproportionately incurred by the community's permanent residents. These are important variables that must be understood in the assessment of institutional change, particularly the long-term impacts. Residents can also be divided by the anticipated distribution of costs within the community. For some residents, the benefits of the bonded development clearly outweigh their own anticipated portion of the long-term costs, as they do not own either property in the community, nor pay other substantial taxes. Others, of course, see the burden as falling disproportionately on their own shoulders, as they realize if population declines and the revenue base declines, the tax rate will increase to compensate for the difference.

Economics and Employment: The amount of employment available in a community is a valuable indicator for the monitoring of institutional change. Gross numbers, however, may be misleading and there are several employment factors that must be taken into consideration to enable accurate interpretation of employment data and what they mean to sociocultural change. One of these is the analysis of what percentage of the employment is available to (or has been accepted by) permanent residents. In a development situation, it is often the case that most permanent residents are not qualified to hold many of the jobs that become available, due to lack of specific job skills. It may be the case that an increase in the number of employed individuals in the community means that local 'employment' has increased little in actuality as far as local residents are concerned since skilled outside workers/administrators have been drawn to the community to fill positions as they became available. In other cases, the work offered is not accepted by locals due to working conditions being found unacceptable, the wages percieved as too low, or the employment is found to be incompatible with more valued pursuits. Obviously, the degree to which permanent residents participate in the employment opportunities will determine its long-term significance. Another dimension of the employment situation that is of central concern for analysis is the sexual division of employment. If employment opportunities are disproportionally available to males, for example, this will

have ramifications for the social structure of the community in general, and for individual family structures as well. The same sort of process is applicable to employment opportunities that are differentially available for different age cohorts. Situations arrise in which 18-24 year olds are willing to fill well-paying but unskilled positions in oil-related firms that older" residents refuse to accept. The presence of high cash-earning younger males in a community traditionally committed to local resource utilization patterns clearly tends to exaggerate generational cleavages, value conflicts, and social schism. Thus, the distributional and structural processes that result from externally induced employment opportunities will be critical to our analysis of institutional change. It should also be recognized that local economic change generated by external development will by no means come in the form of direct sales and employment only. Local tax revenues will also increase. It is often the case that as revenues increase, spending priorities change as well, and this will be an important process to monitor.

Sources of Employment: The sources of employment for residents is important for monitoring sociocultural effects of employment within a community. The positioning of the employment within the social matrix has a determining effect on the long-term impact of such employment. For example, employment by the local Native corporation of local Natives is likely to mean that an individual will be working for another Native, and there may be personal, or small-scale social, conflicts generated by this arrangement as it runs counter to several Native values and norms. At another level, employment by the Native corporation may mean that these jobs will be adjusted to account for local subsistence patterns and maximize both traditional and Western social and economic benefits. Employment by oil companies may bring resentment from people not similarly employed or those who are opposed to oil development. Employment by regional level entities may serve to strengthen those entities on the local level. These are questions that can only be addressed through field data collection.

Public and private sector employment need to be differentiated as well, as private employment would seem to decrease dependence on larger governmental bodies and increase a sense of local stability. However, if the private employment is generated by large, externally-based firms, it may not serve to promote local autonomy, indeed it may be seen to weaken it in the long run. We will attempt to obtain employment figures from the firms directly associated with OCS development themselves, along with their plans for the region in the immediate future. In this way we hope to begin to assess the "sending" side of sociocultural change, that is, to look at the stimuli which the community sociocultural system will receive from the companies themselves.

Economics and Business Development: One of the processes of change in the business sector of a community which often accompanies OCS activity is differentiation and specialization of the local business community. Beyond direct employment by geoseismic firms who are involved in the exploration phase, or the oil companies themselves (which typically account for minimal employment on the local level), local businesses often feel the effects of increased OCS activity. These activities have three potential results: (1) they may increase the volume at existing businesses, increasing the complexity of the business sector as existing businesses differentiate to meet new needs, or (2) new businesses may be drawn to the community to meet the new needs, or (3) new businesses may capture the clientele of existing businesses thus effectively closing them down. Increased volume may be addressed by discussions with the business owners. Business differentiation may be seen by the reorganization of existing businesses, for

example the conversion of a general store to a "department" store with an increase in the range of inventory and the differentiation of goods by department, such as happened with Carl's Commercial in Unalaska. The result of this was that more goods and services were available to the local community due to increased demand generated by external forces, and the actual changes in the structure of the institution were orchestrated by an outsider drawn to the community by the business opportunities. Differentiation may also be seen by the opening of a second store which significantly overlaps in inventory with the original store. An example of this process is when the Alaska Commercial Company opened a store in Unalaska to compete with Carl's Commercial, and both store managers agree that even in a community the size Unalaska that they serve significantly different markets. Finally, differentiation may be seen by assessing the impact of those new businesses which have opened in response to market forces which were not present before the new activities (demand for new services) or increased population. These would include businesses such as marine support services which service the exploration fleet out of Unalaska.

Seasonality of Employment and Traditional Values: Seasonality of employment is another dimension of employment that is critical in assessing its role on the sociocultural system of a community. Increases in some types of wage, fishing, or entrepreurial income during certain periods may result in reduction of the workforce in another area. Periods of critical overlap, i.e., where one employment activity precludes participation in another central cultural area, traditional employment or activity, must be examined for their long-term implications. Where withdrawal occurs from an important social or cultural function, then the implications will be significant. On other hand, we must also look for the implications of non-seasonal employment (i.e., constant, significant income) which may allow the individual access to funds at traditional periods of shortage and thus enable him or her to increase access to culturally important values (and gain prestige under the traditional system). This appears to be the case, for example, for young whaling captains on North Slope, since an important factor here is the incentive to participate and availability of capital to support crew for month on ice. The rewards of participation are more social than economic, but the economic costs of supporting a crew are high and increasing. Some of the older captains feel they are being upstaged by youths, as the younger men have access to sufficient incomes to pursue these socially valued goals. The context of whaling has changed--several older captains noted with disdain an increased 'sport' attitude toward current whaling as economic values are being converted to social capital, while traditional values associated with the subsistence economics of whaling decline. Participation in whaling crews used to depend less on pay than on status and personal incentive. We will be alert for similar processes occurring with sealing in the Pribilof Island where (when and if) year-round employment comes to undermine (some of the more purely) economic returns from sealing participation. It will be important to examine the intersection of household and economic structures to allow analysis of the changes in the role of the household as a unit of production and consumption within the community.

Commercial and Subsistence Economies and Sociocultural Change: It will be important to assess the changes in the nature of the integration of the commercial and subsistence economies of the study communities when monitoring sociocultural/economic change. The typical interaction of an increasingly commercial economy and a subsistence economy is that as the commercial economy becomes stronger, individuals are able to spend more money on subsistence pursuits, though they have less time for these pursuits. Advances in technology

of gear associated with subsistence is now affordable, so that the subsistence time is more efficiently spent. For example, increased technology in transportation means that more of a range can be covered by subsistence hunters or fishermen, but it also means they are able to spend more time at home as they can return from the field more easily. It may mean that different individuals are pursuing different subsistence endeavors than in the past, or that different skills will lead to success in subsistence pursuits, and this will contribute to the process of sociocultural change. It is important to monitor the variables associated with this process to enable assessment of additional changes, if any, that can be differentiated as being associated with OCS activity. Beyond patterns of subsistence utilization shifting with increased economic commercialization, there may be shifts in community redistribution patterns with an increasingly monitized economy. Reciprocity patterns of small, rural communities are often based upon subsistence distribution patterns, and a shift to work cycles associated with wage labor may affect this pattern. Changes that have taken place in this arena will be examined in an attempt to understand the implications, and facilitate the analysis of, OCS-associated commercial change.

Economics and Income Distribution: Significant changes in community income figures, whether they are total income or average income, are important clues that sociocultural changes may be taking place in a community, but they are not indicative of sociocultural change in themselves. From the sociocultural change perspective, what is important about community income is the internal distribution of that income. It is important to gather data that will allow the researcher to estimate the distribution of high, medium and low income earners in the community. This will allow an analysis of whether or not the income nodes for the community are clustered in a particular way, which in turn may be consistent with other observed kinds of change. For example, there may be a hi-modal distribution, with a cluster of non-Native high income earners at one end of the scale, while Native incomes cluster at the opposite (lower) end. The amount of difference between these nodes, and local reaction to it, will be essential to the analysis. Clusters occurring within two or three thousand dollars of one another reflect a very different social context from one in which the gradient is ten and twenty thousand dollars. These differences will profoundly influence the distribution of social and cultural costs of the pre-development, development, and post-development stages. We know from experience that the well-to-do and highly mobile non-Native residents of development communities will be the first to depart the community on evidence of an economic downturn. Thus, monitoring changes in these distribution nodes may provide one of the most accurate measures and indices of actual and anticipated change in the community, and these types of information cannot be garnered from community average income figures.

Published individual income figures are themselves problematic, and collection of field data is essential to a meaningful analysis. Income data are among the most difficult economic data to collect in rural Alaskan communities. Census information on employment and income (as opposed to age, sex, household size, etc.) is typically less than adequate on several grounds. First, it is not collected in fine enough detail to allow the level of analysis required to monitor social changes. Second, the data are not organized into employment categories of use to monitoring the kinds of changes occurring in rural communities. Third, the census information is not available frequently enough to permit timely analysis. Fourth, census information is rarely accessible until two or three years after the field collection itself, at which time it is outdated. Finally, the method of census data collection, while standardized for the entire United States and quite

useful for other applications, is haphazzard when applied to the social and economic conditions prevailing in isolated rural Alaskan communities.

Income and Sociocultural Change: If the problems of gathering income data are overcome, their interpretation and analysis are still problematic. Income figures alone do not, and cannot, reflect how residents view these income differences, which is to say, figures to not tell us what income differences are perceived by residents to be socially significant--i. e., that result in status differences. For example, ownership of a large, self-financed, home may count for a great deal more in terms of a wealth-oriented prestige system than would a very high income. Similarly, the purchase of income-generating equipment or vessels may count more toward establishing a status differential than would the purchase of a new truck, three-wheelers, snowmachines, or the like. In these examples, it is the use to which the income is put, rather than the income itself, which determines whether or not status differentiation (a sociocultural change) has taken place, and this is an important variable to monitor, which is then to be cross-referenced with several other types of data, such as household size, redistribution networks, and so on. These differences, of course, must be assessed in relation to the relative distribution of material and other wealth indicators in the community. All things being equal, it has been our experience that the smaller the population of a community, and therefore the more extensive and intensive existing social relations, the more meaningful are minor perturbations in the distribution of wealth. The larger, more socially complex, and more anonymous the community is, the greater differences in income and the uses to which it is put, must become before they are considered "significant."

Economics and Household Structure: One of the key variables that we will be monitoring is fixed household expenditures and correlating this with income. The economic factors of running a household and the interdependence of households upon each other and other social forms is seen as critical in assessing the social well-being of the community. One of the most fundamental indicators of social well-being is the ability of local residents to keep up with what are perceived as necessary expenses. We will examine the rate of change of expenses and juxtapose that with the rate of change of income. Given funding and time limitations, however, only a cursory examination of the variables will be attempted.

Income and Transfer Payments: Level of income from transfer payments or in-kind subsidization is another important measure of the economy of a community, and changes in these levels may be indicative of sociocultural change. Again, what must be monitored is changes in the internal distribution of these payments over time.

Economics and Gender-Differentiated Sociocultural Change: There may be sociocultural changes generated by economic opportunities being differentially utilized by the sexes, and altering the present sexual division of labor. For example, in the Nuiqsut material it was found that men specialized in short-term seasonal wage labor, and women specialized in permanent year-round positions. It was speculated that this would have long-term consequences for household structure, and networks of kinship and sharing. Women were also seen as more professionalized and more well educated than men. This has influenced interethnic marriage rates and differential sexual mobility, and it was further speculated that men and women were diverging in the degree of their cultural identity. These issues will be addressed in our monitoring program as well.

Health

Institutions associated with health, both in terms of social welfare and physical well-being, are important to monitor in a program designed to assess sociocultural change. It is within these arenas that the researcher can find data that are heuristic with respect to social stresses associated with sociocultural change, and the vitality and/or autonomy of the social system can be examined by looking at the efficacy of local coping mechanisms which function to alleviate social stresses.

Health and Social Welfare: There are two main bodies of data to collect in this area, and these are 'public safety' indices and social service data. Public safety data may be regarded as indicators of stability or instability within the community, with several caveats. The structure of the local public safety institution must be taken into account in the interpretation process. If this institution has increased or decreased in size, or changed in structure, the reasons for these changes must be understood as well as the effect is likely to have had on public safety statistics. For example, a dramatic increase in the number of public safety officers in a community might be due to a perceived increase in crime in the community, or it may be that the community has evolved to the point where the community is demanding different types of services resulting from a changed population. Comparisons of public safety statistics between communities must take into account these structural differences between public safety institutions, which tend to dramatically influence the volume and type of statistics, as well as style of public safety institution contacts with the community. With these caveats in mind, there are three types of public safety data that are important to monitor. First are arrest data. which include changes in rates by category, violent and non-violent felony arrests, and personal and property misdemeanors. The second type of data would be court prosecution records. (These data must be interpreted especially cautiously as these rates tend to vary by the distance of community from the court, and the policies of the local director of public safety.) The third kind of indicator is the ratio of population to public safety personnel, and the changes in this ratio over time. All of these data, in and of themselves, are not indicative of sociocultural change, but they "are measurable institutional changes that point to, or reflect, important areas of sociocultural change within the community.

A second source of social welfare data comes from social service institutions, such as church organizations, locally-based state welfare organizations, counseling groups, and the like. These institutions vary in their degree of formality, and the degree to which provision of social welfare services is their central organizational goal. They all function, at least to some degree, as a social welfare institutions. Non-Native churches often provide redistribution networks for their congregations in rural Alaskan communities, and in this way are functionally similar to informal Native redistribution systems. (Of course 'indigenous' churches often perform similar formal functions for their congregation members as well through their modalities.) The mere presence of these groups is indicative of a perceived need for their services. Among the more important questions to be addressed, is who, or what identifiable group, perceived the need for the social services, how widely this perception was and is shared, and which individuals or groups are taking advantage of the services. Second, the presence of such groups, beyond long-term indigenous forms, is indicative of the failure of the indigenous social mechanisms to deal with emergent social stresses, which may point to sociocultural change occurring.

Health and Physical Well-Being: There are several types of data that can be gathered on physical well-being within the community that will aid in the analysis of sociocultural change. The main categories are clinical data, staffing data, and facilities data. Clinical data are further broken down into two categories. First are data on the visits to the local health care institution. This would include such things as the number of visits and frequency data broken down by population segment. By means of this information the analyst can address the questions of differential states of physical well-being and the differential social stresses that this may indicate. Second are the data on morbidity and mortality by category which allow differentiation by social group, sex, age cohort, and so on. Again, these data will serve a heuristic purpose in pointing to the differential effects of external forces of social stress. Staffing data, such as the ratio of health care staff to population, must be interpreted cautiously, especially between communities. Staffing levels are subject to budget constraints and the shifting of management priorities, but they nonetheless point to community perceptions of well-being. The third type of physical well-being data that will be collected is are data on health care facilities. The construction of facilities is also a valuable set of data as it is a reflection community priorities and of institutional change that is itself less easily observed.

Education

Education and the Enculturation Process: The institution of education is an important one to monitor when assessing sociocultural change for several reasons. Primary among them is the role of the formal education system in the enculturation process--the process by which young people come to learn the values and norms of their society. Changes in this process are indicative of basic sociocultural change. There are several types of data that need to be collected to monitor this institution. First is enrollment data. Enrollment data are useful not only for the analysis of education as an institution, but also as a source of annual population and census data. It can be used to supplement clinical data on community fertility, along with rates of in- and out-migration. In addition, it can be used to assess the effectiveness of the education program structure, at least on some basic dimensions, such as absenses, tardies, and drop-out rates. With supplemental information from school officials, members of the school board, parents, and students, the analysis can address questions of cultural differences which may be influencing these rates. Beyond these 'hard' figures there are other data which will shed light on the education process. These include the goals and priorities of the administration and the school board, discipline issues, standardized test scores, and entering language facility (verbal skills among kindergarten children, particularly English language skills). Changes in these areas will be indicative of sociocultural change.

Formal Education and Ethnicity: One area of the education system that has experienced change in the past few years, and is an important indicator of institutional and sociocultural change, is biligual education programming. These programs can be important indicators of resurgent pride in a Native ethnic identity, but there are several questions that must be addressed before the analysis is made. First, it must be understood what forces were behind the establishment of the program, and what is maintaining the program. Second, how has the program been received locally, how do the students in the program perceive it, and how do the instructors view their motivation and performance? Third, how effective or usefull has the program been from the local perspective.

Education and Social Integration: There are several measures of how well the educational system is integrated into the community and the society at large. One of these is an examination of perceived mission of the school, and an analysis of how well that mission is being fulfilled. If the school is concentrating on preparation for post-secondary education, then the rates of post-secondary education will be a valid measure of the attainment of that goal. If the emphasis is on vocational training for local employment, attainment of that end may be analyzed as well. The priorities of the school may be partially reflected in its local budget, the level of local support to school agendas, functions, etc., while the interal decision-making priority can be identified by an analysis of allocations to the various programs within the school budget programs, or by their share of the school budget.

On the local level, analysis of the role of the institution within the community is an important indicator of social structure. In some Native communities the school and school activities are the hub of many social activities; in others it is not. Though the nature of local education has changed, for many older residents the school is a place that is unpleasant because of past experiences. In some communities the teachers are integrated into the fabric of the community; in others they are segregated from the population spatially and socially, and seem to be tolerated but not accepted by the community. Changes in these areas may be indicative of broad-based sociocultural change, and are important to monitor, along with the more elusive category of school 'morale.' This may be assessed through rates of teacher and administration turn-over. Another area of change that may be monitored is educational facilities construction, though changes in facilities tend to be a less responsive indicator than those already discussed. The interpretation of new facilities construction may be problematic for local level sociocultural change, however, if the community is part of a regional school system. For those communities that have their own school district, facilities construction tends to be responsive to factors other than educational priorities alone: first, there is the fiscal health of the community as a whole to consider, and second, once a new facility is built, lack of construction in the succeeding time frames cannot be taken to be a slackening of interest in education in and of itself.

It should also be noted, when discussing educational change, that educational systems in many areas of rural Alaska have not reached an equilibrium after several landmark decisions, perhaps the most important of which was the Molly Hootch decision. This federal consent degree established, in essence, that Native children were entitled to a high school education in their own communities. (Prior to this decree, children were normally sent out of the villages to larger population centers, to the Mt. Edgecumbe Bureau of Indian Affairs school in southeast Alaska, or to other BIA schools in the lower-48.) The State of Alaska interpreted this to mean that all villages, with 25 school-aged children or more, would be entitled to a fully equipped high school. This decision set in motion a process of sociocultural change that is continuing in many rural villages, and this process must be considered when assessing other changes generated by different stimuli, such as OCS-related development. In many cases this meant that isolated communities received a $2.5 million school building, complete with electrical generation plant, gymnasium, showers and toilets, as well as non-Native teachers (typically from the lower-48) and a new sequence of sociocultural change was initiated. This process must be taken into account when monitoring sociocultural change associated with recent or future resource development.

Concluding Remarks

In conclusion, we wish to make it clear that the four study communities are geographically, physically, socially, economically and culturally distinct entities. In assessing institutional change in these very different settings it is important to recognize that certain kinds of institutional change may play a profound role in the analysis of one community and relatively unimportant role in the next. In addition, our objective will be to accurately report not only the important historical sequence of events but to portray the relative significance and weight of these events in channeling the course of change for the community.

APPENDIX "D"

MONITORING SOCIOECONOMIC IMPACTS OF LARGE-SCALE RESOURCE DEVELOPMENT: A REVIEW OF RECENT EXPERIENCE IN RELATION TO MONITORING SOCIOCULTURAL CHANGE IN RURAL ALASKA

SOCIOCULTURAL MONITORING METHODOLOGY WORKSHOPS

Conducted for

THE U.S. DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

at

THE SHERATON HOTEL

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by

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for

IMPACT ASSESSMENT, INC.

APPENDIX D

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INTRODUCTION

Attempts to anticipate the socioeconomic and sociocultural effects of large-scale development projects (impact assessment) and subsequently to initiate interventions which will ameliorate undesirable effects (impact mitigation) are frequently complicated by uncertainties associated both with defining the nature and extent of the development project and estimating its secondary and higher order effects in a variety of economic and social dimensions. Because of these uncertainties as well as the long time period often associated with project construction, anticipatory impact assessments provide at best an imperfect guide for impact management planning (Gilmore, 1980; Leistritz and Chase, 1982).

A major factor limiting the accuracy and reliability of anticipatory assessments for offshore petroleum developments has been the substantial difficulties experienced in attempting to define the extent of development and hence the potential magnitude of economic and demographic effects stemming from the development activities (Storey, 1982; Leistritz et al., 1985). At the time an anticipatory assessment is typically conducted, many characteristics of the project remain unknown, including the extent and location of recoverable reserves (if any); the nature, location, and scale of resource recovery and transportation facilities; and the policies under which development will take place. In short, the project is incompletely defined and therefore unbounded, and analysts must rely on scenario building in which various known or high probability events are emphasized.

Increasing recognition of the uncertainties associated with development and the resulting limitations of anticipatory assessments as an impact management tool has led to growing interest in impact monitoring systems. Both entities involved in project development and those charged with community growth management planning have seen the need for a system for collecting information concerning project parameters (e.g., work force levels) and community facility capacities. Such a system of monitoring may also be useful to guide impact mitigation efforts, evaluating the effectiveness of the planning process, and identifying emerging problems.[1]

The purpose of this paper is to examine the role of monitoring within the socioeconomic impact management framework and, through examination of systems which have been implemented in connection with previous projects, to suggest implications concerning the design and implementation of a monitoring system for petroleum development in the Alaskan OCS. The remainder of the paper is organized into three major sections. First, the purpose of socioeconomic and sociocultural

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1. For recent discussions of the need for greater emphasis on monitoring in environmental impact assessment generally, see Hollick (1981), Bisset (1980), and Marcus (1979). For discussions specific to the need for monitoring socioeconomic conditions, see Gilmore et al. (1982), Leistritz and Murdock (1981), Leistritz and Chase (1982}, and Berkey et al. (1977).

monitoring and its role in impact management is described, and criteria for designing and evaluating monitoring systems are discussed. Second, several monitoring systems which have been implemented in connection with large-scale development projects are reviewed, and the experience gained in the course of their operation is evaluated. Finally, implications for the design and implementation of the MMS socioeconomic and sociocultural monitoring system are presented.

GOALS OF MONITORING

In a field that is developing rapidly, some inconsistencies in terminology are to be expected. Thus, it is valuable to define here what is meant by the term social impact monitoring%.

In the past the term social monitoring has sometimes been used to refer to both (1) the systematic collection and interpretation of data reflecting social impacts of a development project and (2) actions taken to avoid or minimize adverse effects or maximize beneficial ones. While these two activities obviously will be closely linked (with the data collection and interpretation providing guidance for mitigating actions), it is useful to distinguish the two activities. Thus, Davidson (1984) distinguishes monitoring and management as follows:

> 1. Monitoring involves systematic observation and measurement of environmental or socioeconomic conditions which may be affected by a development, and interpretation of these data by the proponent or government to facilitate ongoing management of impacts.
>
> 2. Management involves government or proponent response to monitoring results by taking action to avoid or mitigate adverse effects or to maximize beneficial ones.

Harvey (198 1) indicates that environmental monitoring efforts can be categorized as (1) descriptive or (2) regulatory. The objectives of descriptive monitoring are to increase quantitative knowledge of natural man-made changes in the environment and to provide early warning of significant environmental changes in order that protective measures may be organized. Regulatory monitoring tends to be focused toward determining compliance with specific regulatory standards (e.g., emission levels). Early work in socioeconomic monitoring generally had a descriptive orientation, but more recent efforts have had regulatory aspects as well (Krawetz, 1981a).

Krawetz (1981a) further clarifies possible goals of socioeconomic monitoring by identifying seven possible purposes for such efforts:

> Compliance: monitoring to establish whether standards or mitigation plans have been satisfied
>
> Knowledge: monitoring in cases where little can be predicted and the object is to describe and document events
>
> Short-term management: a similar operation to monitoring for knowledge, except that the emphasis is on the community as it is affected by the project so that remedial action can be taken

Pro iect control: similar to short-term management except that the focus is on variables pertinent to the construction and operation of the facility

Future planning: intended to derive general principles concerning the facility's effects on the community and surrounding region

Research and development: emphasizes the mechanics of monitoring, the limits of data bases and methods, and reports on alternative approaches

Credibility: to ensure the public that a facility is acting in good faith--it amounts to reviewing the monitoring being undertaken by the company

These seven purposes can be grouped into three broader categories as follows:

1. Increasing general knowledge concerning impacts of major projects, which in turn can enable better planning for future projects. This category would include the "Knowledge" and "Future Planning" objectives outlined by Krawetz as well as "Research and Development," aimed at developing more effective monitoring methods.

2. Determining compliance with specific standards or agreements. In socioeconomic monitoring, this frequently involves assuring that commitments regarding such mitigation actions as compensation payments, training programs, or housing development are being fulfilled. This category includes the "Compliance" and to some extent the "Credibility" objectives discussed by Krawetz.

3. Providing immediate information to guide impact management and community assistance activities and to aid affected communities in planning for and adapting to project-related change. This includes the "Short-term Management" and "Project Control" objectives.

While many monitoring efforts attempt to address all three of these objectives, others focus primarily on one or two. Thus, some monitoring programs have been geared primarily to increasing the general knowledge level concerning impacts while others focused primary attention on providing information for near-term impact management decisions.[2]

2. For another classification of monitoring activities, see Carley (1984).

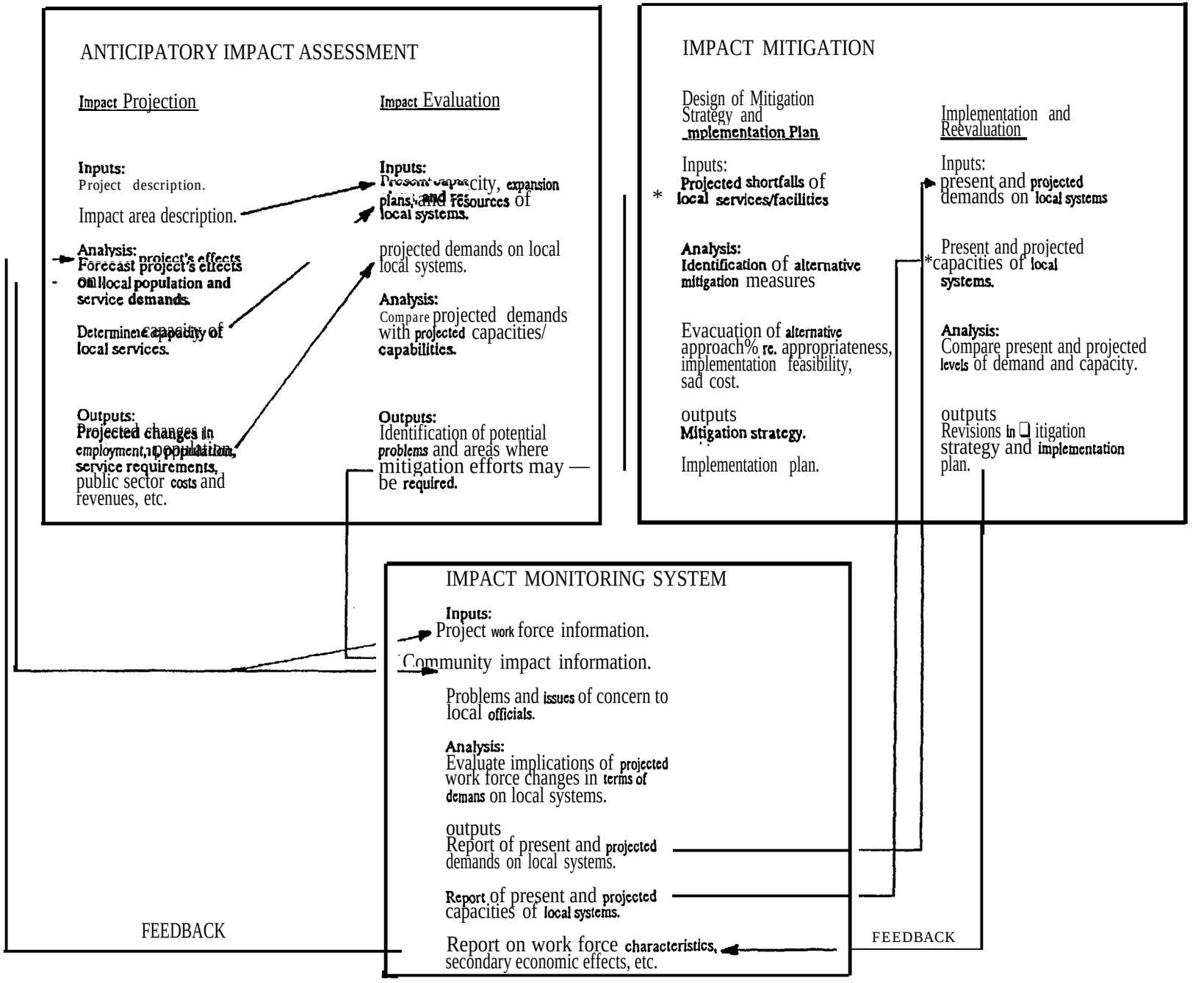

Figure 1. The **Role of** an **Impact Monitoring System in Socioeconomic Impact** Management
Source Adapted **from Leistritz** and **Chase,** 1982.

Role of Monitoring in Impact Management

The primary purpose of a monitoring system within the impact management context is to provide accurate and timely information for decision makers involved in impact assessment and/or mitigation activities. These activities of impact assessment, mitigation, and monitoring are integral components within an impact management framework (Figure 1). The basic intent of this comprehensive system is to analyze and evaluate the potential and actual socioeconomic and sociocultural impacts, as well as to develop specific strategies and measures, to insure that benefits associated with large-scale resource projects are realized (and even accentuated) while adverse effects are alleviated.

Initial guidance for impact management efforts is provided by the anticipatory impact assessment component. The information obtained from these impact assessments is utilized to identify potential problems and to formulate the appropriate mitigative strategies in advance.[3] However, as discussed earlier, such anticipatory assessments offer only a general guide for impact management. In fact, the reliability of these initial estimates may be seriously questioned with subsequent changes in the project construction schedule, work force requirements, and worker settlement or commuting patterns (Braid, 1980; Gilmore et al., 1982). Mitigation strategies based on unrealistic impact assessments are unlikely to be successful. The inclusion of monitoring within the impact management framework removes many of these inherent deficiencies by providing project officials and community leaders with up-to-date information to periodically reassess community needs and revise associated mitigation plans.[4]

In addition to providing information on current demands and capacities of local services and facilities, the monitoring system serves as the basis for developing revised impact projections. In fact, substantial interdependencies exist between the anticipatory assessment and monitoring phases of the impact management process. For instance, the anticipatory assessment suggests which communities are likely to experience significant economic and social changes as a result of project development. These estimates will influence data collection priorities during the initial phases of monitoring. In turn, subsequent revisions in the anticipatory assessment may prove necessary based on information from the monitoring system. In like fashion, if the assessment methods used in the anticipatory analysis are also employed as the basis for subsequent updates (as generally is the case), the nature and form of data collection during the monitoring phase will be influenced by the requirements of the particular assessment techniques utilized. Finally, the monitoring system can serve as a

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3. Monitoring, in the biophysical sciences, is often undertaken by choosing the most sensitive systems and observing changes in those most sensitive elements. This "early warning" system also has potential applicability in socioeconomic impact monitoring, where designated data elements could be monitored for early detection of change along with appropriate mitigative responses (Edwards, 1982).

4. For a more general discussion of the role of monitoring in the planning process, see Haynes (1974).

valuable source of information for anticipatory impact assessments for future projects (Wright, 1977; Krawetz, 1981a; Fookes, 1977).

Thus, at any given time, the monitoring system allows policy personnel to evaluate the effectiveness of impact management activities to date while providing them with the necessary information for future mitigation efforts. This iterative process of impact evaluation and reassessment continues throughout the project development period.

System Desire Decisions

Designing a socioeconomic monitoring system requires decisions concerning a number of system characteristics. Some of the most important decisions are

1. indicators to be monitored,
2. frequency of data collection,
3. data collection mechanisms and analysis procedures,
4. selection of communities to be monitored, and
5. frequency and nature of reporting.

A discussion of these design decisions follows.

Indicators to be Monitored. A monitoring system must be carefully designed. The choice of specific indicators to be monitored can be particularly difficult, since a wide range of variables are relevant to various aspects of impact assessment and mitigation. What data to collect is a vital question that needs to be answered. Too much data leads to a deluge of information in which the meaning is often lost. By taking an overly inclusive approach, the results can be excessive costs for data collection and processing, frustration on the part of the community and the development entity officials who are expected to supply the data, and "information overload" for the decision makers who are the clientele of the monitoring effort.

Frequency of Data Collection. Another major system design decision with obvious trade-offs relates to the frequency of monitoring. Frequent monitoring is desirable as it offers rapid feedback regarding changing conditions and emerging problems to both developer and community decision makers. These officials, in turn, have the opportunity to respond rapidly in adjusting their impact management planning. The more frequent the monitoring, however, the higher the costs. Given these considerations, the most effective approach may be a staged system whereby a few key indicators that are generally expected to accurately reflect changing conditions (e.g., total work force level, school enrollments) are monitored frequently (e.g., monthly or quarterly) while other variables may be measured at longer intervals (e.g., semi-annually or annually).

Data Collection Mechanisms and Analysis Procedures. Mechanisms for data collection and analysis also require careful consideration. Generally, the greater the degree to which the system can rely on information produced through the standard record keeping/reporting processes of the developer's organization, local governments, and state agencies, the less will be the overall cost of the monitoring effort. In many cases, however, existing data sources are not adequate to provide information in the required form or with sufficient rapidity to meet

the needs of impact management. In these cases, special data collection efforts will be required.

Determining data collection and analysis procedures involves decisions concerning the forms of data collection instruments required, the analytical procedures which are most appropriate, and the most efficacious allocation of responsibilities among participating organizations. For example, if decision makers perceive a need for information concerning local residents' attitudes about the adequacy of services and the effectiveness of mitigation measures, collection of primary data from such residents may be required. The decisions to implement such a study will, in turn, require subsequent decisions regarding the form of survey (e.g., telephone, mail, or personal interview), content of the instrument, and form of analysis and reporting. Likewise, if updated impact projections are desired, the most appropriate analytical procedures for developing revised forecasts must be determined. A number of factors must be considered in reaching such decisions, including the frequency at which updates may be required and the number of jurisdictions for which projections must be developed. If updates may be required frequently and for a number of jurisdictions, development or adaptation of a computerized impact assessment model, although requiring a significant initial investment, may prove to be quite cost effective when considered over the entire monitoring period (Leistritz and Murdock, 1981).

Decisions regarding data collection and analysis procedures often will involve considerable input from social scientists. Although many of the considerations involved are in fact quite technical and require concerted attention from individuals with appropriate disciplinary backgrounds and impact assessment/management experience, it is important that developers and community decision makers be involved in these determinations. The choice of data collection and analytical procedures will have a very substantial influence on the types of information which the system can provide, the frequency with which it can be provided, and the cost of the overall monitoring effort. Decision makers must be made aware of these implications.

Determining organizational responsibility for various aspects of the monitoring effort also involves important decisions. In some cases, new organizational forms may be needed. For example, when a substantial number of jurisdictions are expected to be affected by a project, there may be a need for a local entity to coordinate impact monitoring and management activities. At some project sites, impact area coordinating committees have been formed for this purpose. When a number of projects are expected to concurrently affect the same area, an entity to coordinate the impact monitoring and management efforts of the several developers may be desirable. The Inter-Industry Technical Assistance Team was created to meet this need in Mercer County, North Dakota, and the Southwestern Wyoming Industrial Association, the Campbell County Monitoring Association, and the Overthrust Industrial Association have played similar roles in Wyoming (Gilmore et al., 1982). Determining the overall implications of changing construction schedules and other factors when multiple projects have overlapping impact areas may require information and technical impact assessment capabilities which no individual developer or jurisdiction alone possesses. An area council of governments or state agency may be an appropriate entity to provide comprehensive regional impact assessments and updates in such cases, or an inter-industry group might fulfill the same function. Although the most appropriate division of responsibilities among participating entities may differ greatly depending on the nature of the local situation, however, a general consideration which must be kept in mind is that the responsibilities assigned to a given organization should be

commensurate with that entity's resources (information, technical, and financial).

Selection of Communities to be Monitored. Selection of communities to be monitored involves trade-offs similar to those discussed in connection with determining the frequency of monitoring. Even though it is desirable to collect information for all communities which may experience significant impacts, monitoring costs obviously increase with additional communities monitored. It is difficult to provide specific guidelines for this decision. In many cases the most effective approach may be a flexible one in which the initial list of communities to be monitored will consist of those which appear likely to experience substantial impacts, based on the results of the anticipatory impact assessment. For instance, a possible criterion for determining that a community is likely to be "substantially" impacted would be that the large-scale development is projected to lead to a population increase of 10 percent or more, compared to baseline conditions. This initial list would be subject to modification based on monitored information concerning worker characteristics and updated impact projections.

Frequency and Nature of Reporting. A final, but very important, decision concerns the frequency and nature of reporting of monitoring results. If a monitoring system is to provide an effective input into the impact management process, data and analyses must be translated into a series of concise, decision-oriented reports. Although the needs of decision makers and hence the most appropriate reporting format may vary, a staged reporting system in which data on a few key indicators are reported frequently (e.g., quarterly) while other data and analytical results are reported only semi-annually or annually appears appropriate as a general approach. One-time special analyses on particular topics of interest could also be useful.

REVIEW OF MONITORING SYSTEMS

In this section, several monitoring systems implemented in the last decade are compared in terms of the criteria noted above. Several factors were considered in selecting the specific monitoring systems to be examined. First, attention was focused on systems which have been operationalized, in order to benefit from the experience gained in actually operating such a system. Second, systems which were designed primarily for use by decision makers in an impact management mode were given greatest attention. Some impact monitoring projects which have been conducted in recent years were directed primarily toward expanding the data base for subsequent impact assessments rather than as a tool for decision makers (Thompson, Blevins, and Watts, 1978; Urban Systems, Inc., 1980; Henry et al., 1978; Clapp et al., 1976). These systems also were examined but in substantially less detail than the decision-oriented systems.

After systems had been identified, an attempt was made to obtain complete documentation materials for each. In some cases, lack of available documentation materials (e.g., periodic reports, data collection forms) precluded a detailed examination of a system.

The monitoring systems which were selected for detailed examination include the following:

1. Alberta Oil Sands, Fort McMurray, Alberta, Canada (Fort McMurray Planning Team, 1980a, b)

2. Black Thunder Mine, Campbell County, Wyoming (Harvey and Coddington, 1978; Harvey and Pottle, 1979)

3. British Columbia Hydroelectric, Canada (Davidson, 1984; Kopas, 1980; Vincent, 1981)

4. Campbell County Energy Projects, Wyoming (Browne, Bortz, and Coddington, 1983)

5. Cathedral Bluffs Shale Oil Project, Rio, Blanco County, Colorado (Pace Quality Development Associates, Inc., 1980a, b)

6. Chief Joseph Dam, Douglas County, Washington (Harnish et al., 1980)

7. Coal Creek Power Plant, McLean County, North Dakota (Toman et al., 1976; Wieland and Leistritz, 1978; Denver Research Institute, 1979)

8. Colony Oil Shale Project, Garfield County, Colorado (The Tosco Foundation, 1981)

9. Hartsville Nuclear Power Plants, Hartsville, Tennessee (Tennessee Valley Authority, 1978, 1980a)

10. Huntly Social and Economic Impact Monitoring Project, Huntly Borough, New Zealand (Fookes, 1977, 1980, 1981; Vautier, 1977; Krawetz, 1981a, b)

11. Intermountain Power Project, Millard County, Utah (Intermountain Power Project, 1983)

12. Mercer County Energy Projects, North Dakota (Zainhofsky and Pearson, 1981)

13. Missouri Basin Power Project, Platte County, Wyoming (Missouri Basin Power Project, 1977, 1980, 1983)

14. Ontario Hydroelectric, Atikokan, Ontario (Hancock et al., 1981; Baril, 1981)

15. Overthrust Industrial Association, Wyoming (Briscoe, Maphis, Murray, and Lament, Inc., 1982; OIA, 1981)

16. Parachute Creek Shale Oil Project, Garfield County, Colorado (Schmuesser & Associates, 1981)

17. Rio Blanco County/Western Fuels Association, Colorado (Bubriski, 1982)

18. Susquehanna Power Plant, Luzerne County, Pennsylvania (Pennsylvania Power and Light Company, 1976, 1978), and

19. Washington Nuclear Project, Grays Harbor County, Washington (Washington Public Power Supply System, 1980; Dugan, 1981)

Each of these systems is briefly described in the following sections.[5]

Alberta Oil Sands

The Alberta Oil Sands monitoring program was initiated by officials of the New Town of Fort McMurray and the Alberta Department of Municipal Affairs in response to very rapid population growth associated with the development of two large-scale oil sands projects. The town's population grew from 1,303 in 1963 to 4,984 in 1967, during the construction of the first oil sands plant (SUNCOR). When construction of the second project (Syncrude) began in 1972, the town's population was 8,148; when the project was completed in 1978, population had increased to 24,580 (Fort McMurray Planning Team, 1980a).

The monitoring program was initiated in its present form in 1977. The primary purpose of the monitoring activity was to provide current information to local and provincial officials engaged in growth management activities. The principal monitoring vehicle was a special census, conducted annually. The census was supplemented by a quarterly housing report, which includes information on population (historical, present estimate, and projections) and housing (number of units by type and development status). The Annual Census and quarterly housing supplement were coordinated and produced by the Fort McMurray Planning Team (the local planning agency). It included data on total population for the city and its major subdivisions, population by age and sex, migration, family status, average family size, housing (dwelling type, tenancy, vacancy rates, and household size), employment (employment status, employment location, and employer type, by S.I.C. class), and educational attainment.

The system did not include regular reporting on project work force characteristics, nor was a forecasting capability incorporated into the system. It did provide detailed data on population, housing, and related community indicators, however, and was regarded as a very useful data source by local officials and planners (Yacey, 1980).

In summary, the Alberta Oil Sands monitoring program was initiated and conducted by local planning officials as a source of current and accurate information to guide their growth management efforts. Data collection and analysis was directed by the local planning agency, and attention was focused on population characteristics and housing availability. Project proponents were not

5. In addition to the systems listed above, several other studies of facility construction impacts were examined but were not selected for detailed review (Clapp et al., 1976; Fuller, Gibson, and Wenders, 1977; Smith, 1982; Browne, Bortz, and Coddington, 198 lb; Skid more, Owens, and Merrill, 1979; Markham, 1976, 1978). While dealing with issues similar to those treated by the systems listed above, these studies typically either were one-time attempts to document project impacts (Fuller, Gibson, and Wenders, 1977; Skidmore, Owens, and Merrill, 1979) or were limited to a very narrow range of impact phenomena, such as land use or worker characteristics (Clapp et al., 1976; Markham, 1976, 1978).

involved directly in the management of the system, and project characteristics (work force, etc.) were not included in the monitoring system. The monitoring program was not directly linked to impact mitigation, but information from the system apparently was used to justify requests for funding of services and infrastructure development by provincial agencies.

Black Thunder Mine

The Black Thunder monitoring program was initiated by the Atlantic Richfield Company as part of its effort to mitigate impacts associated with the development of a large coal mine in Campbell County, Wyoming. The company was developing a new town (Wright, Wyoming) to provide housing and services for its work force, and the monitoring program was designed to aid company officials in mitigation planning and in discussions with local officials. Because several other large-scale projects were being developed in Campbell County, another objective of the monitoring program was to estimate the proportion of the total economic and social changes occurring in the area which could be attributed to the influence of the Black Thunder Mine. Data collection and analysis were conducted by Bickert, Browne, Coddington, and Associates, Inc. under contract to Atlantic Richfield (Harvey and Coddington, 1978; Harvey and Pottle, 1979).

The monitoring program was operational for two years, 1977-1978. Data collection covered two counties (Campbell and Weston) and three cities (Gillette, Wright, and Newcastle). The system was designed to provide annual reports covering both work force and community indicators and, with respect to community variables, to estimate both the total change and the incremental change attributable to the Black Thunder Mine. Monitoring was conducted over the period 1977-1978, and two reports were prepared. Subsequent discussion of the system is based on the content of those reports.

Indicators monitored included both work force and community characteristics. Work force data were obtained primarily through a survey of the mine workers and included the following information:

1. Place of residence (town and county)
2. Previous residence (county and state)
3. Type of housing
4. Demographic characteristics (marital status and number of dependents)
5. Worker comments regarding adequacy of community services

Initial analysis of the work force data revealed that most of the project workers resided in Campbell County. As a result, the community analysis for 1977 involved more detailed evaluations for Campbell County and towns of Gillette and Wright than for Weston County (Harvey and Coddington, 1978), and Weston County was not included in the 1978 monitoring report (Harvey and Pottle, 1979).

Community data were drawn from both primary (e.g., local officials, realtors) and secondary (e.g., other studies, state reports) sources. Community data utilized in the monitoring system included

1. population and population change (for counties and towns),

2. personal income (for counties),

3. housing (Campbell County and Gillette),

4. employment (Campbell County and Gillette),

5. retail sales (Campbell County and Gillette),

6. assessed valuation (Campbell County and Gillette),

7. school enrollments (Campbell County and Gillette),

8. number of doctors and mental health caseload (Campbell County and Gillette),

9. number of police officers and firemen (Campbell County and Gillette),

10. library capacity (number of volumes), and

11. recreation center usage.

Data were collected annually for all of these indicators. Employment and population estimates were developed on a quarterly basis.

The system included a limited forecasting capability. Projections of the mine work force were presented through 1984, and population and housing projections were presented for Campbell County and for the towns of Gillette and Wright through 1981.

To summarize, this system was initiated and managed by the project proponent as an aid to the firm's impact mitigation efforts. While local officials were contacted to obtain information and were provided with copies of the monitoring reports, they were not involved in the management of the effort. The Black Thunder monitoring program appears to have been the prototype for the Campbell County Monitoring Program (discussed subsequently).

British Columbia Hydroelectric

British Columbia (B. C.) Hydro has been involved with socioeconomic monitoring and management programs with two projects, Seven Mile on the Penal d'Oreille and Revelstoke on the Columbia River. In addition, a program was proposed for the Site C project on the Peace River. Each program is reviewed in terms of the impacts that were predicted, the organizational structure that was created, and the process that resulted (Davidson, 1984).

Seven Mile. The Seven Mile Project is located on the Penal d'Oreille River, a tributary of the Columbia. The 700 MW hydroelectric project was completed in 1980 after a construction period of six years. A peak work force of approximately 1,000 people was employed. The project was constructed with a large

percentage of local labor thus minimizing the number of people moving to the area (Davidson, 1984).

The anticipatory social impact study identified concerns relating to adequacy of housing suPPlY, road traffic, increase in social service caseloads, and possible economic downturn following construction.

The monitoring-management program grew from a recommendation in the social impact studies that suggested a problem resolution process during the construction period which included a citizen advisory committee. Through discussions between B. C. Hydro and the Regional District of Kootenay Boundary, a program was developed where B. C. Hydro provided funds for the Regional District to hire a researcher for the program. In addition, a citizen advisory committee, termed the Project Impact Committee (PIC), was formed through the Regional District. This committee served as a forum for citizens' concerns and made recommendations to B. C. Hydro on the distribution of funds to local community groups.

Monitoring was undertaken during the second and third years of the six-year construction period and resulted in four reports focusing on labor, social issues, economics, and the combined effects. A Construction Labor Force Survey was used in this research. The survey obtained data on labor force characteristics, housing requirements, and use of community services.

The monitoring program indicated that for a variety of reasons, the impacts that were predicted in the social impact study did not occur to the extent forecasted (Baron, 1978). No specific process was identified for impact management, and as issues arose they were addressed by the local governments and agencies, the PIC, and B. C. Hydro.

The monitoring-management program at Seven Mile was considered successful from B. C. Hydro's point of view and probably from the public's viewpoint as well. It appears that the main reasons for its success were that the construction team on-site established and maintained good relations with the community. The PIC was effective in its role, and no major socioeconomic problems arose because of the project.

Revelstoke. The Revelstoke Dam, with an ultimate capacity of 2,700 MW, is located on the Columbia River within the City of Revelstoke boundaries. The project is 2 km north of the city's nearest residential subdivision. Construction began in 1977 and was nearing completion in 1984. At the peak of construction in 1982, 2,920 people were employed.

The social impact assessment report predicted impacts primarily in the area of social services provided by provincial government agencies, such as hospitals, courts, and human resources. Impacts relating to matters under the jurisdiction of the local government, such as fire services, recreation, housing, water supply, and sewers, were also identified and partially addressed through preconstruction mitigation and compensation payments.

An impact- monitor was hired through the Regional District of Columbia Shuswap and received direction from a steering committee called the Impact Monitoring Committee. B. C. Hydro agreed to pay the salary of the impact monitor for as long as the impact monitor was required. As a condition of the water license, two provincial government committees were also formed: the Revelstoke

Project Coordinating Committee and the Community Impact Committee. In addition, a citizens' advisory group was formed, the Local Impact Committee, which initially had no direct relationship with either the provincial government committees or the Impact Monitor. The relationship and reporting lines among these groups were quite complicated, and this was one of the main problems with the monitoring program. Where impact management was required, there was no easily identified process for decision making or appeal (Kopas, 1980; Vincent, 1981).

During the first years of construction, two individuals sequentially held the position of impact monitor. Both left the job largely as a result of the lack of agreement among the various parties involved regarding the objectives and direction of the program.

The impact monitor produced a number of reports on housing, education, food prices, waterworks, industry and employment, and general socioeconomic conditions. B. C. Hydro developed and continues to produce a Labour Force Survey similar to the one used at Seven Mile. The survey is based on a questionnaire completed by construction workers at the point of hire, and the data are analyzed by B. C. Hydro. Since 1981, B. C. Hydro's staff at Revelstoke have continued a limited socioeconomic monitoring-management program.

In addition to the organizational problems with the monitoring program, the Local Impact Committee at times experienced difficulties in providing a focus for citizens' concerns and in effectively dealing with impacts, perceived or real.

The B. C. Hydro monitoring program has identified minimal increase in caseloads in certain areas of social services, such as health, probation, and courts. Services provided by doctors, dentists, and public health staff have not been affected. The extent of impacts in regard to roads, sewers, and downturn effects following project completion is still controversial (B. C. Hydro, 198 1).

In summary, it appears that the Revelstoke monitoring and management program has experienced difficulties. Some of the reasons for this were

1. the existence of several committees and monitoring structures without a clear definition of responsibilities and relationships,

2. a perception by some community leaders that the Local Impact Committee had been ineffective as a forum which could ensure that actions were taken, and

3. the placing of the Impact Monitor as an employee of the Regional District whose main offices and concerns were focused elsewhere.

Site C. The proposed Site C project would be a 900 MW hydroelectric development on the Peace River in northeast British Columbia. The project would be located 7 km southwest of Fort St. John, the economy of which is primarily based on resource exploitation. During the six-year construction period a peak of 1,760 people would be employed.

Socioeconomic impact studies predicted that, depending on the state of the local economy during construction, delivery of social and infrastructure services in the Fort St. John area would be stressed. Due to the reservoir, forty households, mainly ranchers and farmers in the Peace River Valley, would be required to relocate. Five Indian bands in the region expressed strong concerns

that the project would adversely affect their resource-based economy and social structure.

As part of hearings held by the B. C. Utilities Commission (BCUC) for the Site C project, B. C. Hydro made proposals for socioeconomic monitoring-management. The BCUC in turn has made recommendations in its report to the B. C. Cabinet (1983).

As in other projects, B. C. Hydro responded affirmatively to the recommendations that a monitoring-management program should be sponsored. Building the Revelstoke experience, B. C. Hydro developed a process which encouraged discussion of the objectives and structure of the program by all parties involved. B. C. Hydro suggested that the program should be part of an arrangement with the City of Fort St. John since it was the location where the majority of impacts were predicted to occur. A community-based program was proposed through which data would be collected and a focus would be provided for community concerns.

The monitoring team would report to a management board whose precise membership was left for BCUC to determine, but representation was suggested from B. C. Hydro, the City of Fort St. John, the provincial government, and the PDAC. It was expected that most of the management of impacts would occur at this level, but an arbitrator was proposed as the final stage of dispute resolution.

Following hearings, the commission recommended that a monitoring program, funded by B. C. Hydro, be established both to deal with unresolved impacts that have been designated for monitoring or were unanticipated and to verify compliance with the conditions of the Energy Project Certificate.

The BCUC recommended that a monitoring commissioner be appointed by the commission and that the commissioner would be located in the project area and would oversee the program, aided by a small staff and consultants. All disputes or concerns raised by members of the general public and representatives from local and provincial government agencies would be referred to the commissioner for resolution. In resolving the concerns, the commissioner would consult with B. C. Hydro and affected parties.

The BCUC further recommended that B. C. Hydro, the local governments, and each relevant provincial government agency designate a person from the local area who would be available to receive requests and provide data to the commissioner. Further ". . . the monitoring commissioner (would) have the authority to order Hydro to take such measures as are determined to be appropriate through his assessments and to advise the appropriate ministries of the necessary action . . ." Finally an appeal procedure through the Utilities Commission Act was recommended.

As of early 1984, neither B. C. Hydro nor the provincial government had responded formally to these recommendations since an Energy Project Certificate had not been granted (Davidson, 1984).

Conclusions. From experiences of B. C. Hydro over the past decade, it is possible to draw the following conclusions about monitoring-management:

1. It is important that the monitoring-management program be supported by all those involved. This includes the developer, provincial and local governments, and the public.

2. The monitoring function must be undertaken within clear terms of reference. This research aspect should be directed by a group that is directly concerned with the project and its impacts.

3. The monitoring effort must fulfill two functions. First, the indicators that are monitored must be specifically related to the impacts which were predicted or are considered likely to occur. Second, the research program must be able to gather data quickly about particular issues as they arise.

4. The research should be done by a qualified person, preferably a local person familiar with the community.

5. The involvement and cooperation by the proponent, particularly the construction site team, is essential in activities such as reviewing the research, identifying which impacts should be focused upon, and determining mitigation/compensation measures.

6. The public must have access to the monitoring-management program and have confidence that their concerns can be adequately addressed. The distinction between the monitoring or research function and the impact management or action function should be clear (Davidson, 1984).

Campbell County Energy Projects

The primary purpose of the Campbell County monitoring program was to provide governmental officials, industry decision makers, and other community leaders with a single, comprehensive source of socioeconomic data. In addition, the program was intended to provide each of the participating development companies with the information necessary to fulfill the requirements for impact monitoring imposed by the Wyoming Industrial Siting Authority.

The monitoring effort was developed under the auspices of the Campbell County Socioeconomic Monitoring Association, a subgroup of the Campbell County Chamber of Commerce Industry Committee (Browne, Bortz, and Coddington, 1983). The program was initiated in mid-1981, and three reports, summarizing conditions in 1980, 1981, and 1982, have subsequently been published (Browne, Bortz, and Coddington, 1981, 1982, and 1983).

Although the Campbell County socioeconomic monitoring program is managed primarily by representatives of firms engaged in developing energy extraction/conversion projects, officials from local jurisdictions were involved during program design. Thus, key officials from Campbell County, the City of Gillette, and Campbell County School District No. 1 reviewed the proposed work plan and suggested substantial changes to the scope of information to be provided.

The monitoring program reports information on the following key indicators:

1. Population--county and municipal

2. Employment--total and by industry

3. Labor force and unemployment

4. Cost of living.

5. Personal income

6. Other economic indicators--retail sales, bank deposits, utility connections, building permits, and assessed valuation

7. Housing--housing stock, housing availability, vacancy rates, prices, etc.

8. Community facilities and services--water services, wastewater treatment, solid waste disposal, law enforcement, fire protection, parks and recreation, library, health care, education, social services, transportation, and general government

9. Public sector fiscal conditions--revenues and expenditures for: Campbell County, City of Gillette, and Campbell County School District No. 1

In summary, the Campbell County monitoring program was initiated and directed by a group of firms developing energy projects in the area. The program was designed to provide information to guide the impact management efforts of these companies, as well as to meet the requirements of the state Industrial Siting Administration. Local officials were consulted during the design phase of the program, but were not actively involved in program management. The monitoring program provided input to the impact management (mitigation) efforts conducted by some of the participating companies.

Cathedral Bluffs Shale Oil Project

The Cathedral Bluffs monitoring program was initiated by the Cathedral Bluffs Shale Oil Company which was developing an oil shale extraction facility in Rio Blanco County, Colorado. The system began operation in 1978. Data collection and analysis were conducted by Pace Quality Development Associates under contract to Cathedral Bluffs Shale Oil Company (Pace Quality Development Associates, Inc., 1980 b). Monitoring was concentrated on the towns of Meeker (in Rio Blanco County) and Rifle (in Garfield County) and the Meeker and Rifle school districts. In addition, some data were collected and reported at the county level.

The monitoring program included data concerning both work force and community characteristics. Work force data were drawn primarily from a questionnaire completed by all workers at the time they began employment at the site. Work force characteristics which were reported included

1. number of workers by quarter,

2. projected work force requirements (construction and permanent) by year through 1990,

3. place of residence (town),

4. residential status (full-time vs. work-week),

5. length of residence,

6. type of housing (present residence),

7. housing preference,

a. monthly housing cost,

9. demographic characteristics (age, sex, marital status, and family size),

IO. number of school age children (by grade level), and

11. recreational preferences.

Community indicators were monitored semi-annually with the exception of some data from secondary sources which were available only on an annual basis. Community data utilized in the monitoring system included

1. housing--subdivision lots available, housing sales and prices, building permits issued, and rental housing availability and cost;

2. law enforcement and fire protection--personnel, crime reports by type, number of fire and ambulance calls;

3. hospitals and health care--admissions, emergency room visits, number of physicians, and facility expansion;

4. schools--enrollment, facilities, and personnel;

5. employment, underemployment, and labor force estimates (at the county level, from Colorado Department of Labor and Employment);

6. commercial bank deposits and loans;

7. retail sales by type of business (from Colorado Department of Revenue); and;

8. personal income (at county level, from Bureau of Economic Analysis, U.S. Department of Commerce).

The system did not include forecasting capabilities. Monitoring personnel indicated that a projection capability would have been useful but that implementation would have been difficult because several other developments also were underway in the area. Work force data from all projects would have been required in order to develop realistic projections (Cross, 1980).

A report was issued each quarter by the monitoring program. Reports covering both work force and community characteristics were issued semi-annually

while shorter reports dealing only with worker characteristics were published for the intervening quarters. These reports were distributed to all local units of government, to the area Council of Governments, and to other interested parties. A major use of these reports by local officials was to provide justification for federal and state grant applications, particularly for grants from the state Oil Shale Trust Fund (Cross, 1980).

In summarizing the experience gained through operating the monitoring system for about 30 months, the personnel responsible for data collection and analysis made several observations. First, when several development projects are underway in an area, it is extremely desirable for the monitoring system to include work force data from all of the projects. Second, in order to obtain a high response rate from worker surveys, the questionnaire must be simple, and the cooperation of the developer is essential. Finally, although much of the data on community characteristics and services are obtained from the records of local agencies, monitoring personnel may be required to spend considerable time in interpreting and verifying data obtained from such sources.

Chief Joseph Dam

The Chief Joseph Dam monitoring program was initiated by the U.S. Army Corps of Engineers in 1974. The project involved the construction of additional hydroelectric generating units at the Chief Joseph Dam in central Washington between 1975 and 1980. The purpose of the monitoring effort was twofold: (1) to provide planning information to local governments, and (2) to provide a source of data for impact assessments for future projects in other regions. Data collection and analysis were conducted by the Corps' personnel from the Seattle District in conjunction with the Institute of Water Resources, Fort Belvoir, Virginia (Harnisch et al., 1980).

The data collection and reporting procedures employed in this program differed from those of some other monitoring efforts. In particular, the Corps did not establish a fixed schedule for data collection and standardized format for periodic reports. Rather, data collection efforts and report formats varied over the course of project construction in response to specific impact issues and information needs.

The Corps published four reports during the project construction period.

1. Community Impact Report--This report was published shortly before the initiation of project construction (February 1974). Its content was similar to that of many anticipatory impact assessments.

2. Update I: Re-analysis at Initiation of Construction--Published in October 1974, this report contained revised impact projections based on (a) refined work force estimates and (b) a change in the residential allocation formula for project workers (which was based partly on data from the Grand Coulee Dam Construction Project) (Harnisch et al., 1980).

3. Update II: Measuring Construction Related Impacts on Local Schools--Published in April 1978, this report was intended to provide a case history of the impacts experienced by local schools and of the Corps' mitigation activities.

4. Update III: Conditions at Peak Impact--This report was published in December 1978. It provided a summary of work force characteristics and community impact indicators through the period of peak impact (1977).

Two additional reports were planned to complete the monitoring effort. The first of these was to document community adjustment to postimpact conditions. The final report was to analyze the entire community experience from preimpact to postimpact conditions, including Corps of Engineers' community relations, and to provide guidelines for predicting economic and social impacts of future construction projects (Harnisch et al., 1980). To date, however, these reports had not been completed.

Monitoring activities in connection with the Chief Joseph Dam Project included both work force and community data. Construction worker characteristics were monitored through four surveys. The first three surveys indicated only the number of workers and their place of residence, but the fourth was more comprehensive. The worker characteristics covered by the final survey (conducted in December 1977, during the period of peak construction activity) included

1. worker origin (local vs. nonlocal),

2. present residence (location and type of housing),

3. previous residence (location),

4. previous employment status (employed or unemployed),

5. occupation, and

6. demographic characteristics (age, marital status, family size, and number of school age children).

Community data which were presented in the report of conditions at peak impact included the following:

1. population--annual data from state population estimates and some special censuses,

2. housing--number of housing units by type from state reports,

3. economic indicators--bank deposits and retail sales for pre-impact and peak impact periods,

4. schools--annual enrollments and financial data,

5. health care facilities--pre- vs. peak-impact conditions,

6. traffic--annual traffic count data (from State Highway Commission),

7. police and fire protection--pre- vs. peak-impact conditions,

8. sewer and water--pre- vs. peak-impact conditions and construction financing information, and

9. city finances--pre- vs. peak-impact period revenues and expenditures by type.

In addition, qualitative evaluations of impacts were presented in the areas of community growth, community cohesion, civic organizations, recreational sources, esthetic values, and noise (Harnisch et al., 1980).

Community impact monitoring was concentrated on the towns of Bridgeport and Brewster because the worker surveys had indicated that most of the project workers were living in those communities.

Updated impact projections were developed in connection with the Chief Joseph Dam monitoring project. A general update was published in 1974, and revised school enrollment projections were published in 1977. In addition to these published revisions, several unpublished employment and population updates were provided to local officials, congressional representatives, and other interested parties during the course of project construction. These revised forecasts were based on changes in the construction schedule and on the workers' residential information from the periodic worker surveys (Harnisch et al., 1980).

Coal Creek Power Plant

The Coal Creek monitoring program was initiated in 1975 by United Power Association and Cooperative Power Association (UPA/CPA). The two cooperatives were then beginning construction of a 1,000 MW lignite-fired power plant and an associated 5.6 million ton per year (MMTPY) lignite mine in McLean County, North Dakota. The need for accurate planning information was quite apparent, given that all nearby communities were small and thus vulnerable to the problems associated with rapid population growth. Data collection and analysis were undertaken by several entities including North Dakota State University, the North Dakota Regional Environmental Assessment Program, the Old West Regional Commission, and the Denver Research Institute.

The monitoring effort was operational from 1975 through 1979. Project construction began in the spring of 1975, and the first phase of the monitoring effort was the preparation of a set of updated impact projections. This analysis was performed by North Dakota State University under contract with UPA/CPA. The projections, which were completed early in 1976, reflected the most current estimates of construction labor requirements and also utilized data on worker characteristics obtained from recent surveys conducted at power plant projects in the same area (Toman et al., 1976). The updated projections were utilized extensively by local officials in planning to meet the requirements of growth and were also used to justify requests for grants from the state Coal Impact Fund (Leistritz, Murdock, and Senechal, 1980).

The second phase of the monitoring activity was sponsored by the Old West Regional Commission as part of a regional longitudinal study of energy development impacts. During the period 1976-1978, researchers from the University of Wyoming and North Dakota State University collected and analyzed data related to both work force characteristics and community impact indicators (Thompson, Blevins, and Watts, 1978). UPA/CPA personnel and community officials cooperated in this monitoring effort and obtained immediate access to the results.

The results of the local data collection and analysis were utilized in

developing updated impact projections. Data on worker characteristics were utilized, together with revised projections of project work force requirements, to develop updated impact projections for each affected jurisdiction (North Dakota Regional Environmental Assessment Program, 1977, 1978). These projections were rapidly disseminated to the affected jurisdictions and interested state "agencies (e.g., the state Coal Impact Office) and were a key input into growth management planning and decision making. A computerized socioeconomic impact assessment model operated by the North Dakota Regional Environmental Assessment program was the mechanism used to develop the revised projections (Leistritz et al., 1979; Leistritz, Murdock, and Senechal, 1980).

The final phase of the monitoring activity was conducted by the Denver Research Institute (DRI) under contract with the Electric Power Research Institute. The DRI project was a retrospective case study of the impacts of the Coal Creek project and was part of a nationwide study of power plant impacts. It provided an assessment of the actual impacts of the project and also an evaluation of the effectiveness of the impact management strategies which were employed (Denver Research Institute, 1979). The DRI report concluded that impact management measures had been effective and that the overall evaluation of the project's effects by local residents was quite positive.

The Coal Creek monitoring activities were focused on McLean County, the towns of Washburn and Underwood, and their school districts. While the updated impact projection study had considered a number of additional communities (Toman et al., 1976), the projections indicated, and subsequent monitoring confirmed, that Washburn and Underwood would experience most of the in-migration associated with the project.

Work force characteristics were examined through a survey of the project workers conducted during August-September 1976 (Wieland and Leistritz, 1978). Characteristics examined included

1. worker origin (local vs. nonlocal),
2. demographic characteristics (age, marital status, family size, number of children by age group),
3. place of residence and length of residence,
4. type of housing,
5. job classification,
6. education, and
7. income.

Community characteristics were monitored during the period 1976-1978, and the results were presented in two reports (Center for Urban and Regional Analysis, 1977; Thompson, Blevins, and Watts, 1978). Indicators monitored included

1. employment by type,
2. population (estimates),

3. retail sales volume and number of trade and service establishments,

4. housing patterns and preferences,

5. school enrollments,

6. local services and residents' satisfaction with services,

7. local price levels and wage rates, and

8. revenues and expenditures of local governments.

The Coal Creek program is similar to the Chief Joseph Dam effort in that both were initiated in the mid-1970s before impact monitoring had become common. Both appear to have involved some experimentation concerning data collection procedures, institutional relationships, and related factors. The Coal Creek program is somewhat unique in that a large number of entities played a part in the effort. A substantial degree of continuity was maintained between monitoring phases, however, principally because personnel from North Dakota State University were involved in all phases. As local planning capabilities in development areas increase and local planning bodies desire to play a greater role in impact monitoring and management, cooperative efforts like the Coal Creek program may become more frequent.

Colony Oil Shale Project

The Colony socioeconomic monitoring program was initiated in 1981 by the Colony Project, a joint venture of Exxon U.S.A. and TOSCO Corporation. Data collection and analysis were conducted by the TOSCO Foundation (TOSCO Foundation, 1981). Monitoring was concentrated on characteristics of the project work force and on community facilities and services available in the new town of Battlement Mesa. Reports were prepared quarterly and presented to the Garfield County Board of Commissioners in compliance with conditions attendant to Colony's Garfield County Special Use and Land Use Permits (TOSCO Foundation, 1981). (The Colony Project was mothballed in May 1982, and monitoring was suspended in 1984.)

Work force data were drawn principally from a questionnaire administered quarterly to all project workers. Work force characteristics reported included

1. current place of residence (town),

2. place of residence before employment on the Colony Project (same town, different town in Colorado, or out of state),

3. type of housing and housing ownership,

4. worker origin (locally hired or relocating),

5. demographic characteristics (age, marital status, family size, and school-age children), and

6. projected work force requirements (through the end of 198 1).

Total project-related population also was projected through the end of 1981.

An inventory of community services and facilities in Battlement Mesa also was presented. Items included

1. housing units "by type--units or lots developed, units or lots occupied, ultimate capacity, completion date, and plans for next quarter;

2. water--ultimate capacity, completion date, current status, and plans for next quarter;

3. sewer--ultimate capacity, completion date, current status, and plans for next quarter;

4. electric power and natural gas--ultimate capacity, completion date, current status, and plans for next quarter;

5. telephone and cable television--ultimate capacity, completion date, current status, and plans for next quarter;

6. schools--ultimate capacity, completion date, current status, and plans for next quarter;

7. churches--ultimate capacity, completion date, current status, and plans for next quarter;

8. police and fire protection--ultimate capacity, completion date, current status, and plans for next quarter;

9. health care facilities--ultimate capacity, completion date, current status, and plans for next quarter;

10. recreational facilities--ultimate capacity, completion date, current status, and plans for next quarter; and

11. commercial facilities--ultimate capacity, completion date, current status, and plans for next quarter.

Because the Colony monitoring program had a relatively short operational period, it is difficult to fully evaluate the experience gained through operating the system.

Hartsville Nuclear Power Plants

The Hartsville monitoring program was initiated in 1976 by the Tennessee Valley Authority (TVA) in conjunction with the construction of a 5,000 MW nuclear power plant complex near Hartsville, Tennessee. Although TVA had been monitoring characteristics of work forces at its power plant construction projects-since 1968 (Wright, 1977), the Hartsville monitoring program is its most extensive effort in this area to date.[6] As a condition for construction licensing, the Nuclear

6. TVA monitored impacts at two of its other power plant construction projects,

Regulatory Commission required TVA to initiate impact mitigation and monitoring programs for the Hartsville project (Tennessee Valley Authority, 1978). The result was a monitoring program designed specifically to focus on the needs for and the effectiveness of mitigation efforts. (The Hartsville project was phased down substantially in 1981, and further layoffs occurred in 1982. The monitoring effort has been pursued less intensively since that time.)

Data collection and analysis were conducted by personnel of TVA's Community Development Division. Monitoring reports were prepared semi-annually and submitted to the Nuclear Regulatory Commission as well as to local governments in the impact area. The program was scheduled to continue for three reporting periods after the operating license for the last unit of the four-unit plant had been issued (Tennessee Valley Authority, 1978).

Work force data were collected through a semi-annual survey of all project workers.[7] Information obtained included

1. worker origin (local vs. nonlocal);

2. present residence--location (county and city), type of housing, ownership status, and length of residence;

3. previous residence (location);

4. family status and number of school-age children by grade level;

5. previous employment--occupation, industry, and location; and

6. vocational training.

In addition to these characteristics, the total number of workers at the site was reported.

Community impact information was reported for five counties in the project's impact area and for seven cities within these counties and their school districts. The number of counties and cities to be monitored was subject to change over time with changes in the number and residential location of relocating project workers. The general criterion was that monitoring would be considered for any county which is the place of residence of 100 or more relocating workers or any city with 50 or more relocating workers (Tennessee Valley Authority,

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Yellow Creek and Phipps Bend. These monitoring efforts were similar to, but somewhat less extensive than, the Hartsville program. For more information on these projects, see Tennessee Valley Authority (1980a, 1980b, 1980c).

7. In addition to the semi-annual survey, TVA obtained some information from Hartsville workers at the time of initial hiring. This entry-level information was input into the monitoring system and later updated based on information from the semi-annual survey (DeVeney, 1981).

1980a). Community indicators monitored, frequency of monitoring, and data sources are summarized in Table 1.

The semi-annual reports from the Hartsville monitoring system also provided a summary of mitigation activities undertaken, the cost to TVA of these efforts, and an evaluation of their ef f activeness. As of March 31, 1980, TVA mitigation expenditures totaled $6.8 million with the largest costs being in the areas of employee transportation ($3.3 million) and education ($1.5 million). A committee of local officials, called the Hartsville Project Coordinating Committee, met periodically with TVA officials to review the monitoring program (Tennessee Valley Authority, 1980a).

The Hartsville monitoring program did not include a formal forecasting/reassessment capability. Work force characteristics revealed by the monitoring effort were compared with the characteristics assumed in the anticipatory assessment, and the implications of differences were evaluated qualitatively. Officials responsible for operation of the monitoring system indicated that substantive updates (reassessments) of projected impacts were undertaken only when a major change in projected work force requirements or a substantial shift in worker characteristics was evident. Two such updates were prepared during the first five years of project construction (DeVeney, 1981).

Officials responsible for the TVA monitoring activities offered several observations related to the design and operation of such systems. First, the response rate for the worker surveys was quite high (60-70 percent), but this was at least partially attributable to the fact that TVA uses no subcontractors on its projects (hence all workers are TVA employees). It was strongly recommended that worker survey requirements be stipulated in contracts with all subcontractors in order to ensure their cooperation with a monitoring effort (DeVeney, 1981). Second, with respect to work force surveys, it was suggested that a semi-annual survey is a good compromise between the need for current information and the increased cost associated with more frequent surveys. An alternative to semi-annual surveys which could result in a moderate reduction in system costs would be to schedule work force surveys on an annual basis, but with the option of performing an interim survey if work force size should change substantially (e.g., by more than 1,000 workers).

In summary, the Hartsville program appears to be one of the most ‘comprehensive monitoring efforts undertaken to date. Because of mitigation requirements imposed by the Nuclear Regulatory Commission, monitoring efforts were specifically designed to measure the effectiveness of mitigation activities and to provide guidance for mitigation planning. The approach used in determining which communities were to be monitored is particularly noteworthy. The initial determination was based on the results of the anticipatory assessment which suggested that five counties and seven towns would experience the bulk of the impacts. Other communities or counties could be added, however, based on monitoring results. Such flexibility appears desirable in designing a monitoring system.

TABLE 1.
COMMUNITY IMPACT INDICATORS INCLUDED IN THE HARTSVILLE MONITORING PLAN

Variable		Source
Population	Population estimates by county for five county area	State, Local Censuses, TVA Estimates
Secondary Employment	Population changes	TVA Estimates
	Basic employment changes (these data are used by 'the TVA to estimate secondary employment)	
Education	Classrooms, Equipment, School buses	Seven school districts
	Impact students (name, school previously attended, attendance information, transportation information)	TVA employee data
	Educational mitigation payments	TVA
Housing	Housing supply by type and by county*	TVA and local realtors
	Housing mitigation activity	TVA
Local Planning Assistance	TVA assistance payments	TVA
Water and Sewer	Capacity and additional connections possible*	TVA survey
	Mitigation activity	TVA
Health and Medical Services	Employee use of medical services	TVA Employee Survey
	Mitigation/Technical assistance	
Traffic	Vehicles at peak hour**	Tennessee DOT
	TVA commuter traffic	TVA
Employee transportation	Bus and van ridership	TVA
	Transportation expenditures	TVA
Local government budgets	Total Revenues	Local governments
	Total Expenditures	Local governments
	TVA payments	TVA
Local recruitment/training	Employee residence by county	TVA
	Enrollment in training programs	TVA
Recreation	TVA mitigation activities	TVA
Day care program	TVA activities	TVA

NOTE: Frequency of data collection is semiannual, with the following exceptions:
* notes data collected one-time with updates
** notes data collected quarterly at 12 locations

SOURCE: Tennessee Valley Authority, 1980a.

Huntly Social and Economic Impact Monitoring Project

In 1975, the University of Waikato (Hamilton, New Zealand) School of Social Science formed a research unit to monitor the social and economic consequences resulting from the construction and operation of a 1,000 MW thermal power plant in nearby Huntly Borough. The research unit, financed by grants from New Zealand's Ministry of Works and Development and Ministry of Energy, was responsible for both the tracing of socioeconomic impacts and the 'researching of specific problems and issues related to the power project. These principal . operations were predicted on three specific initial objectives:

1. to identify potential problems for mitigation purposes,

2. to gather information for planning assistance in future large-scale projects, and

3. to devise methods for future monitoring of large-scale projects (Fookes, 1977).

As the project progressed, however, it became clear that these objectives were overly ambitious in light of the resources available and that prioritization would be essential (Fookes, 1981). As a result, a decision was made to concentrate on objective 2. Similarly, although the intention of the research unit was to monitor the effects on both the community of Huntly and its wider region (defined by the four surrounding counties of Raglan, Wakato, Waipa, and Otorohanga), most activities were concentrated on Huntly and its immediate environs.

The general framework of the monitoring program was that of an integrated information system. The structure of this comprehensive system was composed of ten parameters:

1. biosphere--changes in the physical environment (e.g., air and water quality) and their socioeconomic implications;

2. land--information on changes in use, subdivisions, and occupancy;

3. anthropics--information on changing attitudes and values as they relate to the power project;

4. demography--data on population characteristics, in-migration, and project workers' places of residence;

5. education--information on school facilities; teacher and pupil characteristics, and operating expenditures;

6. community welfare--information on changes in health services, public order (crime), leisure and recreation, societal conditions, and social welfare services;

7. economy--information on power plant expenditure flows, secondary or "spin-off" effects, retailing characteristics, public costs and revenues, and redistributive effects in the labor market;

.8. manpower--data on employment changes for the power project, as well as other basic industries and services;

9. politics--data on local voting patterns and minutes of local council meetings; and

10. networks--information on public services such as utilities, transportation (including traffic volume, licensing, and journey to work statistics), and communications.

Monitoring reports were published annually during the period 1976-1981, with summary tables provided for the vast array of parameter indicators. Particular attention was given to a variety of labor force and community indicators as specified within the parameters of demography, manpower, networks, community welfare, and economy. Interim reports contained information on the direct and indirect effects upon housing, employment, power project expenditures and material resources, provisions of public services, community cohesion, and the local economy. Data were collected largely from secondary sources, along with on-going surveys of the project work force, local business owners, and citizenry. In addition, a number of working papers were published on specific issues relating to the local economy's interaction with the power project; the economic impact upon local services, transportation and construction firms; and characteristics of project and secondary workers (for example, see Krawetz, 198 I a, 1981 b; Fookes, 198 1; Vautier, 1977). Although reporting efforts were comprehensive in scope, the Huntly monitoring program included no forecasting capability. The project was completed in 1981, and a 13-volume final report was published (Fookes, 1981).

Intermountain Power Pro ject

The Intermountain Power Project (IPP), a 1,500 MW coal-fueled plant, is located in Millard County, Utah (about 100 miles southwest of Salt Lake City). Monitoring was required as a condition of the Conditional Use Permit issued to IPP by Millard County. The monitoring effort and project construction both began in 1981.

The objectives of the monitoring program are

1. to fulfill the Millard County Board of Commissioner's Conditional Use Permit obligation;

2. to provide meaningful and timely information with which to deal with impact mitigation on such items as (a) IPP work force levels, (b) IPP work force commuting and relocating patterns, (c) IPP relocatee family characteristics and other pertinent demographic information, (d) IPP-related public and private support or secondary job generation, (e) IPP weekly /relocatee housing demand and the availability of an adequate supply to meet that demand, (f) local public facility and services demands generated by IPP-related population compared with the capacity of public facilities and services to meet those demands, and (g) the geographic distribution of the IPP-related weekly/relocating population;

3, to compare actual IPP work force and population numbers and public facility/services demands with projections, and then to provide revised projections, if required, based on such monitored data; and

4. to assess the effectiveness of the mitigation plans that have been or are now, being developed and implemented to alleviate adverse socioeconomic impacts (Intermountain Power Project, 1983).

The monitoring program includes two counties, Millard and Juab. Within this two-county area, attention is concentrated on an area known as "west Millard County" where most of the impacts are expected to occur.

Reports are prepared quarterly with a more comprehensive analysis being presented annually. Information provided in the quarterly reports includes

1. number of workers--present and projected;

2. worker commuting patterns;

3. characteristics of workers' dependents;

4. housing--type of housing utilized, and vacancy rates; and

5. service utilization--including school enrollment, hospital cases, public assistance caseloads, mental health cases, public health services, and social service cases.

Work force information is obtained from an entry survey (i.e., completed by the worker when he or she joins the project). Public service information is drawn primarily from the respective local and regional agencies responsible for service provision. A third important source of information is an annual census conducted in the communities where substantial project-related growth is occurring or expected to occur (Intermountain Power Project, 1983). Each household within the designated area is contacted by an enumerator. Key items included in the survey are employment status and the relationship of employment to IPP, length of employment, and length of residence in the area. Housing units are counted and classified to type, tenure, and vacancy/occupancy status.

Monitored information is used as a basis for updating impact projections. Annual summary reports include projections of the project's work force; baseline, project-related, and total population; housing demand (i.e., number of housing units needed); and number of school-age children. These indicators are projected for each quarter during the construction period and for the communities expected to receive substantial impacts as well as for the total impact area.

Information from the monitoring effort has been utilized extensively in developing impact mitigation strategies. As of the end of 1984, IPP had committed $27 million to impact assistance for local governments and service districts. In addition, IPP had committed about $25.7 million to development of temporary and permanent housing.

Mercer County (North Dakota) Energy Projects

The Mercer County monitoring program was initiated in 1978 as a result of conditions attached to the siting permits issued by the North Dakota Public Service Commission (PSC) to three industrial groups proposing to develop energy

projects in the county. The industrial firms proposed to construct two coal-fired power plants and a coal gasification plant, all within a 10-mile radius of Beulah, North Dakota. Under terms of an agreement between the industrial firms and the PSC, three entities were assigned responsibilities associated with impact monitoring. The firms, through an Inter-Industry Technical Assistance Team (ITAT), were to provide periodic reports of their work force levels and worker characteristics to the PSC and other interested parties. The Mercer County Energy Development Board (EDB) was assigned responsibility for monitoring community impacts; the EDB was comprised of county and city elected officials and employed a small professional staff. The North Dakota Regional Environmental Assessment Program (REAP) was to utilize the work force data to develop revised impact projections if work force levels and/or characteristics departed significantly from those used in the anticipatory impact assessment. (REAP terminated operations in June 1979. Subsequently, ITAT and the EDB shared responsibility for preparing updated impact projections until 1981 when the EDB was disbanded. From 1981 through 1984, ITAT assumed sole responsibility for providing updated projections. The Mercer County monitoring program was concluded in December 1984.)

The industrial firms formed an Inter-Industry Technical Assistance Team (ITAT) to coordinate work force reporting as well as to provide impact mitigation assistance to local governments. ITAT published monthly reports on work force levels and worker characteristics. Worker data included

1. total work force by site;

2. comparison of actual work force with previous estimates;

3. previous residence;

4. present residence--location and residence status (daily commuter, weekly commuter, or relocating worker); and

5. demographic characteristics (marital status and average family size).

Worker data came from a questionnaire administered to all workers when they begin employment. Work force reports were provided to the EDB, the PSC, REAP, and the state Coal Impact Office, among others.

The EDB apparently monitored a variety of community impact indicators, but formal reports were not prepared for distribution. Information derived from the EDB's monitoring was used to support local planning and capital budgeting activities, but detailed information concerning this use was not available.

Information from the work force monitoring effort was used as the basis for revised impact projections. REAP prepared revised impact projections in 1978 and 1979, and both ITAT and EDB also prepared revised projections during the period 1978-1981. (For example, see Inter-Industry Technical Assistance Team, 1980.) The principal reason for revision of the anticipatory projections was a delay in the construction schedule for the gasification plant. The date for initiating construction of this facility was postponed from 1978 to 1979 and then to 1980, and full-scale construction activity did not begin until the fall of 1981. From 1981 through 1984, ITAT published projections of work force levels, population, number of households, and school enrollments on a semi-annual basis.

Data collection for the monitoring program focused on Mercer County and the county's six incorporated municipalities and their school districts. The work force reports indicated the general location of residence for daily commuters from outside the county but did not indicate what percentage of these daily commuters might have moved to the area to work on the projects. Likewise, the REAP projections included estimates of the impacts of the Mercer County projects on adjacent counties (North Dakota Regional Environmental Assessment Program, 1978, 1979). Community data collection was restricted to Mercer County and its component jurisdictions.

Information from the monitoring program was used extensively by local officials in their facility planning and budgeting decisions. It also was utilized by local jurisdictions in justifying requests for grants and loans from the state Energy Development Impact Office (Halstead and Leistritz, 1983).

Missouri Basin Power Project

The Missouri Basin Power Project (MBPP) monitoring program was initiated in 1976 when MBPP, a consortium of consumer-owned electric utilities, was just beginning construction of a 1,500 MW power plant in Platte County, Wyoming. A stipulation of the permitting process, administered by the Wyoming Industrial Siting Council, was to establish a Project Area Coordinating Council (PACC). The PACC, consisting of elected officials of the major political subdivisions of the county, was charged with analyzing changes which might occur as a result of project construction and with assessing the effectiveness of impact alleviation efforts (Missouri Basin Power Project, 1977, 1980, 1983). To assist the PACC, the MBPP developed a monitoring program to provide data and analyses to PACC members. The monitoring activity, and the PACC, terminated on December 31, 1982, because construction of the project was virtually complete.

The purpose of the monitoring program was to:

1. assess the effectiveness of impact mitigation strategies,

2. provide data to assist in verifying assumptions made to project population growth,

3. describe the demographic characteristics of the construction work force and associated population, and

4. provide data that would signal the need for new public or private services in the area (Missouri Basin Power Project, 1980).

Socioeconomic data were collected by MBPP personnel. An analysis team, made up of members of the Industrial Siting staff, private consultants, and MBPP personnel, reviewed the data and provided the PACC with a monthly analysis of social and economic activity in Platte County. More detailed monitoring reports were prepared on a quarterly and annual basis.

Monitoring activities were focused on Platte County, the city of Wheatland, and two school districts (Platte County School Districts #1 and #2). Four other towns in Platte County also were monitored but in less detail.

Monthly monitoring reports included information in the following categories:

1. work force--number of workers by type (construction and permanent, comparison of actual and projected work force levels)

2. worker characteristics--worker status (daily commuter, weekly commuter, or temporary resident)

3. MBPP associated population (number)

4. MBPP housing--occupancy and housing availability in Black Mountain Village (MBPP sponsored housing development)

5. school enrollment--by district

The quarterly monitoring reports included data in the same areas covered by the monthly reports. However, quarterly reports contained more detail in each data category and addressed some topics not covered in the monthly reports. Data contained in the quarterly reports included

1. work force--historical and current data as well as revised projections are presented on work force level, worker characteristics, and residential-commuting patterns;

2. MBPP related population;

3. school facilities and enrollments--for each district, school enrollments, student capacity, and percent utilization are presented including revised enrollment projections when appropriate;

4. housing--private sector housing activity (building permits), occupancy of MBPP housing;

5. public service caseloads, including:

a) police calls and arrests

b) fire calls

c) ambulance calls

d) hospital--admissions, percent of beds occupied, and number of outpatients

e) public health office--conferences, home visits, office visits, and telephone calls

f) mental health center--new admissions by type (local resident vs. new resident)

g) social service caseload--AFDC, emergency assistance, general assistance, medical payments, day care, and food stamps

h) recreation center utilization

i) day care center--average enrollment; and

6. public finance--county, city, and school district budget data.

Annual monitoring reports summarized trends and changes in the indicators included in the quarterly reports. In addition, estimates of project-related secondary employment were included, and an evaluation of public attitudes and perceptions was presented.

MBPP monitoring reports included revised projections of the project work force. Updated projections were sometimes presented in selected impact categories (e.g., school enrollments), but the monitoring reports did not describe the methods and assumptions used in developing revised projections. Projection revision was triggered by significant deviation of actual data from original projections.

Ontario Hydroelectric

Ontario Hydro has conducted monitoring programs in connection with several power plant construction projects including the Bruce and Darlington Nuclear Generating Stations and a coal-fueled plant located near Atikokan. The monitoring activity is conducted as a part of a community impact agreement negotiated between Ontario Hydro and the affected communities. Because all of these agreements are quite similar, only the Atikokan monitoring effort is described here.

The Atikokan Community Impact Monitoring Program was initiated by Ontario Hydro and the Township of Atikokan in order to examine changes to the social, economic, and cultural conditions of Atikokan during construction of the generating station. The community impact agreement negotiated in 1978 formalized the intent of the monitoring effort as well as specifying Ontario Hydro's responsibility to provide financial assistance to the community and establishing an arbitration procedure to resolve any disputes that might arise (Hancock et al., 1981; Baril, 1981).

The purpose of the monitoring program is "to systematically measure, record, and analyze both 'baseline' data describing the community before the commencement of Ontario Hydro construction activity and subsequent data which may indicate community change and the causes and impacts of that change." The approach used in monitoring is comprised of four major steps:

1. Potential factors causing community change are identified, and the variations in activity of these factors for the monitoring year are described. In the case of Atikokan, the primary "change factors" include employment levels at Ontario Hydro and two major mines in the area, as well as such external factors as interest rates and national economic conditions.

2. The indicators of resulting community change are measured for the monitoring year. Key community indicators include (total and by industry), income, housing (total stock, vacancy rates, prices), school enrollments and capacities, rates of beverage alcohol consumption, numbers of criminal offenses by type, alcohol- and drug-related hospital cases, library

utilization and capacity, hotel and camping accommodations, police services, fire services, hospital utilization, social service utilization, township services (water, sewer, solid waste), traffic counts, and township " budget summaries.

3. The planning responses of the community, Hydro, and government are described for the year. This includes program responses, planning, payments, etc.

4. The year's changes are assessed in the light of historical factors and future trends and issues. The purpose of this measure is to link together factors potentially causing the change and indicators measuring community change and to do so in some evaluative framework useful for planning (Hancock et al., 1981).

The Atikokan monitoring program is operated as a cooperative endeavor of the Township and Ontario Hydro. The township's planning coordinator and the Community Studies department of Ontario Hydro have been responsible for data collection, analysis, and report preparation.

Ontario Hydro initially committed $1.1 million for community impact assistance. Monitoring information plays a key role in decisions regarding use of these funds. During the first three years of the agreement, however, few expenditures were made because growing employment at the Hydro site served primarily to offset layoffs at nearby mines.

Overthrust Industrial Association

The Overthrust Industrial Association (OIA) was formed by a group of firms engaged in developing oil and gas resources in a six-county area of southwestern Wyoming, northeastern Utah, and southeastern Idaho. Development was occurring rapidly and leading to substantial impact problems for local jurisdictions, particularly the city of Evanston, Wyoming. The OIA was formed as a mechanism to enable the development firms to pool information concerning present and projected levels of activity, and the implications of development for nearby communities (Gibson, 1982; Briscoe, Maphis, Murray, and Lament, Inc., 1982). The OIA conducted an assessment of impact mitigation needs, initiated a mitigation program, and established a monitoring system. As a first step in the mitigation program, the OIA committed $1.8 million to local agencies (OIA, 1981). The monitoring system was designed to provide information to aid local planning and guide mitigation efforts.

A major challenge in designing the OIA monitoring program was obtaining information concerning present operations and future plans from the more than 60 firms engaged in oil and gas development. Once initial estimates of present and projected employment levels had been obtained from the firms, simulation models were used to project levels of induced employment and population growth likely to result.

Key sources of information for the monitoring system included the following items:

1. A survey of plant managers of over 60 oil and gas service firms regarding their current employment, the specific nature of their services,

and the relationship for their services to current well site preparation, well development, well completion, and well production in the six-county monitoring area.

2. A survey of key staff persons in over 50 firms to determine their current employment, the location of current work (as distinct from the location of the firm offices), and the household characteristics and place of residence of current employees.

3. Discussions with numerous industry officials regarding current proposals for development of gas processing plants, pipelines, field gathering systems, and other facilities such as nitrogen injection and gas dehydration plants. The discussions covered the capacity of the contemplated facilities, the likely location, the construction schedule, various contingencies, and other relevant data.

4. Discussions with numerous industry officials regarding the nature of oil and gas development--e. g., the likely rates of resource recovery from various geological formations in the six-county monitoring area, the minimum economic size and typical service areas of various types of gas processing facilities, the mix of gas, oil, and liquids likely to be recovered from various resource fields, etc.

5. Analysis results from the monitoring data base regarding average well development time requirements, success rates, and production rates.

6. Information on the size of various residential communities within commuting distance of the six-county monitoring area, the capacities of their public systems, and their distance from each current and potential area of oil and gas development.

The monitoring system was developed through review and interpretation of Petroleum Information reports on drilling, production, and leasing, and through review of the resulting data with industry officials. From this was assembled a "development history" of each well under development in the monitoring area and a "production history" of each producing well. The initial data base included 540 wells which were in any phase of development between April 1980 and July 1981, and .460 wells (1,065 including Sublette County) which were in production in July 1981. An example of the data base for Chevron's 23-29B well at Painter Reservoir is shown in Table 2.

Given the data base for each well in development or production, it was then possible to analyze the data to yield information on the specific characteristics of oil and gas development and production in the monitoring area, e.g.:

-- well development activity at selected points in time (see Table 3);

-- well development time requirements;

-- drilling success rates; and

-- average production rates.

This information together with estimates of the area's oil and gas reserves

enabled estimation of direct employment requirements, and subsequently of secondary employment, population, service requirements, and fiscal impacts.

The system was designed to allow periodic updating of impact estimates. Updates were expected to occur in response to changes in the development outlook, rather than adhering to a fixed time schedule (Overthrust Industrial Association, 1981.

Parachute Creek Shale Oil Project

The Parachute Creek monitoring program was initiated by Union Oil Company pursuant to the conditions attached to a Special Use Permit issued to the company by Garfield County (Schmueser & Associates, 198 I). Data collection and analysis were contracted to Schmueser & Associates, and reports were submitted quarterly. Monitoring was restricted to work force characteristics.

Given the data base for each well in development or production, it was then possible to analyze the data to yield information on the specific characteristics of oil and gas development and production in the monitoring area, for example,

-- well development activity at selected points in time (see Table 3);

-- well development time requirements;

-- drilling success rates; and

-- average production rates.

This information together with estimates of the area's oil and gas reserves enabled estimation of direct employment requirements, and subsequently of secondary employment, population, service requirements, and fiscal impacts.

The system was designed to allow periodic updating of impact estimates. Updates were expected to occur in response to changes in the development outlook, rather than adhering to a fixed time schedule (Overthrust Industrial Association, 1981.

TABLE 2. MONITORING DATA BASE: CHEVRON WELL 23-29B

The following demonstrates what types of well development information are available in the Well Monitoring System, regarding Chevron's 23-29B well at Painter Reservoir:

1.0 Well Identification Data

Operator: Chevron
Rig-Lease Name: 23-29B
Drilling Contractor: Loffland
Township-Range Location: 16N, 119W, Section 29
Initial Well/Field Class: Development-Oil
Geographic Location Information:
Field: Painter Reservoir
State: Wyoming
County: Uinta
Geologic Area: Overthrust Belt
School District: Uinta County District #1
Special Tax Districts: None

2.0 Well Development History

Pre-Drill Phase
First Report Date: 8-14-79
Length: 6.9 months
Drill Phase
Spud Date: 3-12-80
Length: 3.0 months
Completion Phase
Completion Start Date: 6-12-80
Length: 1.1 months
Well Outcome
Completion Date: 7-15-80
Outcome: Successful, Development Oil Well
Total Time
Spud Date to Completion Date: 4.1 months
First Report to Completion Date: 11.0 months

3.0 Well Production History

Initial Production Date: 8-80
1980 Gas Production (MCF): 263,945
1980 Oil Production (BLS): 116,200
Cumulative Gas Production (MCF): 263,945
Cumulative Oil Production (BLS): 116,200
Special Status: None

SOURCE: Briscoe, Maphis, Murray, and Lament, Inc., 1982.

TABLE 3. WELL DEVELOPMENT ACTIVITY: BY DEVELOPMENT PHASE: SIX-COUNTY MONITORING AREA; 7-1-81

	Phase				
County	Pre-Drill	Drill	Completion	Production	Total
Uinta County	69	35	50	142	296
Lincoln County	41	17	32	202	382
Summit County	12	14	29	72	127
Rich County	4	2	0	1	7
Bear Lake County	0	1	0	0	1
Sublette County	15	12	38	605	670
Western Sweetwater County	4	3	7	43	57
6-County Study Area Totals	145	84	156	1,065	1,540

SOURCE: Briscoe, Maphis, Murray, and Lament, Inc., 1982.

Parachute Creek Shale Oil Project

The Parachute Creek monitoring program was initiated by Union Oil Company pursuant to the conditions attached to a Special Use Permit issued to the company by Garfield County (Schmueser & Associates, 1981). Data collection and analysis were contracted to Schmueser & Associates, and reports were submitted quarterly. Monitoring was restricted to work force characteristics.

Work force data were drawn from a periodic survey of all project workers. Characteristics reported included

1. place or residence (town),

2. prior residence (same town, different town in Colorado, and out-of-state, by state),

3. type of housing and housing ownership,

4. demographic characteristics (marital status, family size, and school age children), and

5. projected work force requirements (through 1983).

The monitoring activities ended in 1983 as the first phase of the project was completed.

Rio Blanco County/Western Fuels Association

The Rio Blanco County/Western Fuels monitoring effort was initiated in 1981 as part of a comprehensive socioeconomic impact mitigation agreement between the county and Western Fuels, which was proposing to develop a coal mine. The agreement called for Western Fuels to provide approximately $7 million in front-end capital expense money to Rio Blanco County, the town of Rangely, and several special districts (Bubriski, 1982). In addition, the developer was to provide up to $8 million in additional capital aid when the need arose and to compensate the county and town for additional operating costs attributable to the project. The purpose of the monitoring system was to ". . . allow the parties to the Agreement to make appropriate adjustments in their responsibilities and obligations under the terms and conditions of the Agreement" (Bubriski, 1982). If project-related population (i.e., in-migrants) should exceed the level anticipated, the agreement provided for additional payments to the affected jurisdictions.

The monitoring program was administered by a county employee designated as the Rio Blanco County Impact Coordinator. The program was designed to meet the following broad objectives:

1. To track quarterly the demographic changes accompanying the project in each jurisdiction and the effects of this growth on the supply and availability of housing for project-related population and Rangely senior citizens

2. To determine whether the capital facilities required by the agreement must be expanded due to greater-than-expected levels of project-related population growth

3. To project, on an annual basis, the demographic changes with and without the project and the effects of this differential growth on operating revenues and expenditures in each entity

4. To attribute to the project (in the form of payment requests or credits) the projected differences between cumulative and adjusted baseline budget forecasts

5. To reconcile, at the end of each fiscal period, the payments or credits made in Item 4 with the actual fiscal experience of each entity

In addition, the monitoring program was to include mechanisms

6. to assure that the parties to the agreement are informed of the major assumptions and data used in projecting demographic and fiscal effects and that these projections be available for review in draft form by the parties before they are finalized and

7. to provide for ease of expanding the monitoring program to include other major energy development projects as they locate in the county.

The basic procedure utilized in the monitoring effort is outlined in Figure 2 (Bubriski, 1982). It can be noted that substantial emphasis is placed on estimating project-induced revenues and expenditures of the affected jurisdictions because those calculations provide the basis for determining the magnitude of compensation payments to be made by the developer.

An Advisory Committee was established to periodically review the results of the monitoring program and overall implementation of the mitigation agreement. The committee was comprised of one representative of each of the Special Taxing Districts in Rangely, the town of Rangely, the Rio Blanco County Planning Commission, Western Fuels, and Deseret Generation and Power Transmission Cooperative (the sole user of the coal from the Western Fuels mine).

FIGURE 2. Elements of the Monitoring System and Their Relationship to the Impact Projection Process

Demographic/Fiscal Information		Stem in the Monitoring Program
Project-Related Employees by Period	1	Quarterly review of project employees by type and specific project
Project-Related Employees by Period and Jurisdiction	2	Quarterly review of project data on employee household and settlement characteristics
Induced workers by Period and Jurisdiction	3	Periodic review of induced work force and demographic characteristics (survey)
Project-Related Population by Period and Jurisdiction	4	Quarterly review of availability and adequacy of housing for project-related and elderly population
Baseline Revenue/Expenditure by Period and Jurisdiction	5	Annual determination of inflation levels, non-project-related population changes, and budget items by jurisdiction
Cumulative Revenues by Period and Jurisdiction	6	Annual review of taxation policies, mill levies, and rates; projections of project-related additions to retail, commercial, residential base by jurisdiction
Cumulative Expenditures by Period and Jurisdiction	7	Annual review of per capita expenditure, economics and diseconomics of scale; analysis of extraordinary operating expenses by jurisdiction
Projected Revenue/Expenditure by Period and Jurisdiction	8	Annual projection of baseline and project-related population by jurisdiction; final specification of per capita revenues and expenditures by jurisdiction
Actual Revenue/Expenditure by Period and Jurisdiction	9	Annual review of actual revenues and expenditures by jurisdiction; reconciliation of assumptions and line items used in projections with actual by jurisdiction
Reconciliation of Actual and Projected Balances by Period and Jurisdiction	10	Annual analysis of differences between actual and cumulative projections with respect to project-related growth, inflation, sources of revenues, and levels of expenditures by jurisdiction

SOURCE: Bubriski, 1982.

Susquehanna Power Plant

Pennsylvania Power and Light Company (PP&L) has prepared two reports which evaluate the impacts of constructing the Susquehanna Steam Electric Station (Pennsylvania Power and Light Company, 1976, 1978). This monitoring effort was undertaken as a voluntary effort to provide ". . . a full case history . . . which might prove valuable to PP&L and to other interested parties in assessing short- and long-term social costs and benefits" (Pennsylvania Power and Light Company, 1976). Thus, the major purpose of the Susquehanna monitoring project was to provide background information concerning socioeconomic impacts and mitigation needs which could be utilized in planning impact management programs for future construction projects as well as in guiding mitigation efforts in the Susquehanna project area.

Personnel of the Community Services Department of Pennsylvania Power and Light Company were responsible for data collection, analysis, and report preparation. Monitoring efforts were concentrated on three counties (Luzerne, Columbia, and Lackawanna) and on three principal communities (Salem, Briar Creek, and Berwick) within these counties. In addition to the two reports which have already been released, a third report is being planned for publication soon after the first unit of the plant is operational (Bujnowski, 1981).

Indicators monitored include both work force and community characteristics. Work force characteristics were based on surveys of nonmanual personnel, conducted in 1975 and 1978. Data collected in the surveys included

1. worker origin (local vs. nonlocal),

2. place of residence (county, city, school district),

3. housing (type and tenure),

4. demographic characteristics (age, family size and number of school age children by grade level),

5. shopping patterns (daily needs vs. major needs),

6. recreational activities,

7. hospital use and purpose, and

8. attitudes toward area of residence (aspects liked best and least).

In addition, the county of residence for all manual personnel was determined in 1975 and 1978. These surveys indicated that most manual personnel commuted daily from nearby metropolitan areas. Thus, the Susquehanna project resulted in little in-migration to the local area except by nonmanual (management) personnel.

Community impact indicators discussed in the reports included:

1. population--historical census data and estimates for counties and cities;

2. employment and labor force--unemployment rate, etc.;

3. housing--supply and costs;

4. educational facilities--enrollment and capacity;

5. traffic--traffic volume, employee transportation;

6. hospitals--caseload;

7. water supply;

8. public safety--police (personnel, arrests), emergency services;

9. local economy--local purchases, inflationary impacts, etc.; and

10. residents' attitudes.

The Susquehanna monitoring program does not explicitly include a forecasting capability. Work force projections are presented, and enrollment projections from secondary sources are included in the reports, however.

Washington Nuclear Project

The Washington Nuclear Project (WNP) monitoring program was initiated in 1977. The project involved the construction of two 1,240 MW nuclear power plant units in Grays Harbor County, Washington. The monitoring system was mandated by a "site Certification Agreement" between the Washington Energy Facility Site Evaluation Council (EFSEC) and the Washington Public Power Supply System (WPPSS), the project developer. The agreement states: "Supply System agrees to monitor the primary and secondary socioeconomic impacts of the project during construction and to report quarterly the results to the Council" (Washington Public Power Supply System, 1980). Project construction was suspended in 1983, and the monitoring effort also appeared to have been scaled back substantially.

WPPSS personnel had primary responsibility for data collection and analysis. The Supply System, however, entered into contracts with the Grays Harbor Regional Planning Commission, the Thurston Regional Planning Council, and the Mason Regional Planning Council to collect community data in various portions of the five-county impact area. As a result of these separate entities involved in collecting community data, there were some variations in the type of data reported and the frequency of reporting. Further, a designated "primary study area" (including portions of Grays Harbor and Thurston counties) was monitored more intensively than the remainder of the five-county region.

The monitoring program included both project and community characteristics. Project characteristics included

1. number of workers by type--quarterly average and quarterly peak, manual workers by craft, nonmanual workers by employer;

2. work force forecasts through completion of construction;

3. major construction accomplishments for the quarter;

4. prevailing wage rates by craft;

5. worker characteristics, including:

   a) rnigrant/nonmigrant status

   b) place of residence (work- week)

   c) household characteristics

   d) marital status

   e) age

   f) number of school age children

   g) type of dwelling; and

6. sales and use taxes paid.

Worker characteristics were determined from a short worker questionnaire administered at the time a worker was hired or rehired at the project. The response rate was generally quite high (for example, 99.5 percent for the third quarter of 1980) (Washington Public Power Supply System, 1980).

Community data collected by the regional planning groups included

1. population--state estimates, annual;

2. employment--annual estimates of employment and income from BEA (U.S. Department of Commerce); labor force, employment, and unemployment, monthly from the state;

3. economic indicators--bank deposits and loans, sales and use tax receipts (bimonthly), number of businesses by type (annual, from Yellow Pages);

4. housing--new units by type (from building permits), assessed valuation of new construction, sales of residences (annual, price, and number);

5. schools--inventory and condition of school facilities;

6. local government finances--revenues, expenditures, long-term debt, assessed valuation, and taxation;

7. traffic--traffic counts, accidents, vehicle occupancy rates;

8. land use--subdivisions and zoning changes;

9. human resources--social service caseloads, vital statistics;

10. public safety--offenses by type, arrests;

11. recreation--parks and recreation facilities by city or county;

12. utilities--residential power users (bimonthly), water users (quarterly); and

13. public attitudes (from surveys).

The WPPSS monitoring reports thus contain data on a vast array of community indicators. These data were drawn largely from secondary sources, however, and the data reported differed among counties depending on which of the regional planning groups was responsible for data collection. The usefulness of the published reports is further limited by the fact that they contain no analysis of the community data to determine the extent of project impacts. Local planning officials point out, however, that this is not a problem from their perspective (Dugan, 1981, 1982). Apparently the decision not to include an assessment of project-related impacts in the monitoring reports arose from the fact that local officials and WPPSS representatives often differed in their evaluation of such impacts. This was sometimes a contentious issue because the Supply System was obligated (by terms of the siting agreement) to compensate local governments for "all demonstrated net financial burdens related to the project" (Dugan, 198 1). These net financial burdens proved difficult to determine in an unambiguous manner, however, and extensive negotiations were frequently required before mutually agreeable levels of compensation were determined (Dugan, 1981; McGinnis, 1981),

The WPPSS monitoring system did not include a projection capability. Monitoring personnel indicated that a projection capability would have been useful and that the principal reason why a reassessment capability was not included was the lack of ready access to a suitable impact assessment model at the time the program was initiated (McGinnis, 198 I).

In summarizing the experience gained through operating the monitoring program for several years, personnel responsible for data collection and analysis made several comments. First, with respect to the work force information dimension, WPPSS preferred the entry survey approach because response rates were high and costs were lower than those associated with a periodic survey (worker census). The major cost difference was believed to be the worker's time which would be lost from construction activity if a periodic survey were undertaken. The major shortcoming of the entry level survey was believed to be the difficulty experienced in accounting for rehires (because worker termination data were not input to the system). Second, in regard to reporting frequency, a quarterly frequency was believed to be appropriate for work force data, but an annual frequency was believed more appropriate for the majority of community data items. Finally, it was suggested that future efforts should focus on a smaller number of data items, particularly in the community data area, and should allocate more resources to data analysis and to reassessment of impacts based on changing conditions (McGinnis, 198 1).

The 19 operational monitoring systems described in the preceding sections are compared in Table 4. Examination of Table 4 reveals significant contrasts among these systems. Eight of the systems were initiated between 1975 and 1977, and five were initiated since 1980. Nine are still in operation. Seven of the monitoring programs were initiated voluntarily by project developers while ten were required by regulatory authorities as a condition for project licensing/permitting, and two were sponsored by government agencies. All but one system include information on work force characteristics. Worker characteristics monitored are quite similar among systems with information on present and

projected work force levels, migrant status (local/nonlocal), place of residence, and demographic characteristics being included in most systems. Mechanisms for worker data collection differ among systems with both entry surveys and periodic surveys being used extensively.

Some community impact indicators are included in all but one of the systems reviewed. Variables measuring effects on schools, housing, public safety, and health care are included most frequently. Data collection is usually conducted on an annual basis with some key services being monitored semi-annually and occasionally on a more frequent basis. All systems make use of data from annual reports of national, state, and local agencies with additional data collection undertaken principally in cases where existing reports are deemed inadequate either in frequency or detail of information provided. The number of jurisdictions monitored differs substantially among systems with the primary criterion apparently being to include those units which may experience significant impacts.

Eleven of the systems incorporate forecasting/reassessment capabilities with work force requirements, population, and school enrollments being the variables most often projected. Frequency of reporting varies substantially among systems. Two systems provide monthly reports on work force level and worker characteristics while other systems report these data, often together with selected community impact indicators, on a quarterly, semi-annual, or annual basis. In genera], systems which are mandated by regulatory authorities tend to feature fixed reporting schedules while those initiated by developers often have more flexible reporting formats.

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS

	Alberta Oil Sands	Black Thunder Mine	B. C. Hydro	Campbell County
Dates operational:	1977 to present	1977 to 1979	1977 to present	1981 to present
Auspices for monitoring:	Initiated by local government	Initiated by developer	Provincial government (condition of license)	Initiated by developers
Entity responsible for data collection and analysis	Local planning personnel	Developer (by contract with consulting firm)	Regional planning agency	Developer association (by contract to consultants)
Indicators monitored:				
1. Work force information				
a. Present work force	MA	X	X	X
b. Projected work force	MA	X	X	X
c. Worker characteristics	MA			
-migrant status		X	X	X
-place of residence		X	X	X
- type of housing		X	X	X
-marital status and number/age of dependents		X	X	X
-housing preference				
-housing cost				
-public service satisfaction		X		
d. Mechanism for work force data collection	MA	Initial survey followed by entry survey	periodic survey	Periodic survey
2. Community impact information				
a. Housing	X	X	X	X
b. Public safety		X		X
c. Health care		X		X
d. Education (schools)		X	X	X
e. Employment, labor force, unemployment	X	X	X	X
f. Retail sales		X	X	X
g. Bank deposits/loans				X
h. Personal income		X		X
i. Population	X	X	X	X
j. Assessed valuation		X	X	X
k. Other services		X		X
1. Public finance				X
m. Traffic				
n. Service satisfaction				
o. Mitigation expenditures				X

- Continued -

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Alberta Oil Sands	Black Thunder Mine	B. C. Hydro	Campbell County
Number of jurisdictions monitored	1 city	2 counties; 3 cities	Not specified	1 county; 2 cities
Frequency of data collection	Annual	Annual	Not specified	Annual
Forecasting/reassessment capability:				
Included in system	No	Yes	No	Yes
Variables	NA	Work force Population Housing supply		Employment Population Housing demand School enrollment Personal income Assessed valuation
Reportings:				
Report frequency	Annual census report; Quarterly housing reports	Annual (two reports were issued)	Several reports (no fixed schedule)	Annual

- Continued -

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Cathedral Bluffs Shale Oil Project	Chief Joseph Dam	Coal Creek Power Plant	Colony Oil Shale Project
Dates operational:	1978 to present	1974 to 1980	1975 to 1979	1981 to 1984
Auspices for monitoring:	Initiated by developer	Initiated by developer	Initiated by developer	County government (cond. for land use permits)
Entity responsible for data collection and analysis	Developer (by contract with consulting firm)	Developer (U.S. Army Corps of Engineers)	Developer in cooperation with North Dakota State University, North Dakota REAP, and University of Wyoming	Developer (by contract with consulting firm)
Indicators monitored:				
1. Work force information				
a. Present work force	X	X	X	X
b. Projected work force	X	X	X	X
c. Worker characteristics				
-migrant status	X	X	X	X
-place of residence	X	X	X	X
-type of housing	X	X	X	X
-marital status and number/age of dependents	X	X	x	X
-housing preference	X			
-housing cost	x			
-public service satisfaction				
d. Mechanism for work force data collection	Entry survey	Periodic surveys	One-time survey	Periodic surveys
2. Community impact information				
a. Housing	X	x	X	X
b. Public safety	X	X	x	x
c. Health care				X
d. Education (schools)	X	X	X	X
e. Employment, labor force, unemployment	X		X	
f. Retail sales	X	X	x	
g. Bank deposits/loans	X	X		
h. Personal income	X			
i. Population		X	X	
j. Assessed valuation				X
k. Other services		X		
1. Public finance		X	X	
m. Traffic		X		
n. Service satisfaction				
o. Mitigation expenditures			X	

- Continued -

TABLE 4b. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Cathedral Bluffs Shale Oil Project	Chief Joseph Dam	Coal Creek Power Plant	Colony Oil Shale Project
Number of jurisdictions monitored	2 counties; 2 cities	2 cities	1 county, 2 cities	1 city
Frequency of data collection	Semi-annual (some annual)	1 major study for peak impact period	Annual	Quarterly
Forecasting/reassessment capability:				
Included in system	No	Yes	Yes	Yes
Variables	NA	Work force Population School enrollment	Work force Secondary employment Population School enrollment Housing requirements Service requirements Net fiscal balance	Work force Population
Reportings:				
Report frequency	Quarterly work force reports; semi-annual community facilities reports	Four reports were issued during period 1974-1978	Four reports and numerous unpublished projection updates during the period	Quarterly

- Continued -

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Hartsville Nuclear Power Plant	Huntly Power Project	Intermountain Power Project	Mercer County Energy Projects
Dates operational:	1976 to 1983	1975 to 1981	1981 to present	1978 to 1984
Auspices for monitoring:	Nuclear regulatory commission (condition for construction licensing)	Initiated by national government	County government (condition for special use permit)	North Dakota Public Public Commission
Entity responsible for data collection and analysis	Developer (Tennessee Valley Authority)	University of Waikato Social Science School	Developer	Developer (ITAT), local planning body (EDB), and state research agency (REAP)
Indicators monitored:				
1. work force information				
a. Present work force	X	X	X	X
b. Projected work force	X		X	X
c. Worker characteristics				
-migrant status	X	X	X	X
-place of residence	X	X	X	X
- type of housing	X	X	X	
-marital status and number/age of dependents	X	X	X	X
-housing preference				
-housing cost				
-public service satisfaction		X		
d. Mechanism for work force data collection	Semi-annual survey	Annual survey/Periodic survey	Entry survey	Entry survey
2. Community impact information				
a. Housing	X	X	X	Not specified
b. Public safety		X	X	
c. Health care	X	X	X	
d. Education (schools)	X	X	X	
e. Employment, labor force, unemployment	X	X	X	
f. Retail sales		X		
g. Bank deposits/ loans				
h. Personal income		X		
i. Population	X	X	X	
j. Assessed valuation	X	X		
k. Other services	X	X		
1. Public finance	X	X	X	
m. Traffic	X	X		
n. Service satisfaction		X		
o. Mitigation expenditures	X	X	X	

- Continued.

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Hartsville Nuclear Power Plant	Hunt 1 y Power Project	Intermountain Power Project	Mercer County Energy Projects
Number of jurisdictions monitored	5 counties; 7 cities	1 city	..	1 county; 6 cities
Frequency of data collection	Semi - annual	Annual	Quarterly	Not specified
Forecasting/reassessment capability:				
Included in system	No	No	Yes	Yes
Variables	NA	NA	Employment Population Housing demand	Work force Secondary employment Population Housing requirements
Reportings:				
Report frequency	Semi - annual	Annual	Quarterly	Monthly work force report

- Continued -

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (Continued)

	Missouri Basin Power Project	Ontario Hydro	Overthrust Industrial Association	Parachute Creek Oil Shale Project
Dates operational:	1976 to 1982	1978 to present	1981 to present	1980 to 1983
Auspices for monitoring:	Wyoming Industrial Siting Council	Community impact agreement	Initiated by developers	County government (cond. for special use permit)
Entity responsible for data collection and analysis	Developer	Developer and local officials	Developer (by contract with consulting firm)	Developer (by contract with consulting firm)
Indicators monitored:				
1. . Work force information				
a. Present work force	X	X	X	X
b. Projected work force	X		X	X
c. Worker characteristica				
-migrant status	X			X
-place of residence	X	X		X
- type of housing	X			X
-marital status and number/age of dependents	X			X
.housing preference				
-housing cost				
-public service satisfaction				
d. Mechanism for work force data collection	Entry survey	Project records	Survey of firms	Periodic survey
2. Community impact information				
a. Housing	X		X	NA
b. Public safety	X	X		
c. Health care	X	X		
d. Education (schools)	X	X		
e. Employment, labor force, unemployment	X	x		
f. Retail sales				
g. Bank deposits/loans				
h. Personal income		X		
i. Population	X	X		
j. Assessed valuation	x			
k. Other services	x			
1. Public finance	X	X		
m. Traffic		X		
n. Service satisfaction	X	X		
o. Mitigation expenditures	X	X	X	

- Continued -

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Rio Blanco County Western Fuels	Susquehanna Power Plant	Washington Nuclear Project
Number of jurisdictions monitored	1 county; 3 cities	3 counties; 3 cities	5 counties
Frequency of data collection	Quarterly	Annual	Annual (some quarterly)
Forecasting/reassessment capability:			
Included in system	Yes	No	No
Variables	Work force	NA	NA
Reportings:			
Report frequency	Quarterly	Two reports (1976 and 1978)	Quarterly

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Rio Blanco County Western Fuels	Susquehanna Power Plant	Washington Nuclear Project
Dates operational:	1981 to present	1975 to present	1977 to 1983
Auspices for monitoring:	County government (condition for special use permit)	Initiated by developer	Washington Energy Facility Site Evaluation Council
Entity responsible for data collection and analysis	Local government	Developer	Developer (contracts with regional planning bodies)
Indicators monitored:			
1. Work force information			
a. Present work force	x	X	X
b. Projected work force	x		X
c. Worker characteristics			
-migrant status	x	X	X
-place of residence	x	X	X
- type of housing	x	X	X
-marital status and number/age of dependents	x	X	X
-housing preference			
-housing cost			
-public service satisfaction		X	
d. Mechanism for work force data collection	Periodic survey	One- time survey (1975 - 1978)	Entry survey
2. Community impact information			
a. Housing	x	X	X
b. Public safety		X	X
c. Health care		X	X
d. Education (schools)		X	X
e. Employment, labor force, unemployment		X	X
f. Retail sales			X
g. Bank deposits/loans			X
h. Personal income			X
i. Population		X	X
j. Assessed valuation			X
k. Other services		X	X
1. Public finance	X		X
m. Traffic		X	X
n. Service satisfaction	X		X
o. Mitigation expenditures	X	X	

- Continued -

TABLE 4. COMPARISON OF OPERATIONAL SOCIOECONOMIC MONITORING SYSTEMS (continued)

	Missouri Basin Power Project	Ontario Hydro	Overthrust Industrial Association	parachute Creek Oil Shale Project
Number of jurisdictions monitored	1 county; 5 cities	1 township	6 counties	NA
Frequency of data collection	Monthly and quarterly	Annual	Not specified	NA
Forecasting/reassessment capability:				
Included in system	Yas	No	Yes	Yes
Variables	Uork force School enrollment	NA	Employment Population Tax base	Work force
Reportings:				
Report frequency	Monthly (work force, population, housing, and school enrollment); Quarterly (work force and community)	Annual	Not scheduled	Quarterly

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SYSTEM EVALUATION

The monitoring systems compared in the preceding section can best be characterized as pioneering efforts initiated during a period when the guidelines for socioeconomic impact assessment were just beginning to evolve and impact mitigation (community assistance) activities were being undertaken at only a few project sites. The intent of this section is to draw upon the experience gained in developing and operating such systems to summarize our impressions of the current state-of-the-art in socioeconomic monitoring for large-scale projects and to point out areas where additional conceptual and/or institutional development appears to be required. The evaluation is based not only on a review of the reports emanating from the various systems but also on interviews with key personnel responsible for operation of several of these systems (Cross, 1980; DeVeny, 1981; McGinnis, 1981, 1983; Pearson, 1981, 1983; Rafferty, 1981; Threadgill, 1984). In each interview, system personnel were asked both to comment on the usefulness and limitations of the procedures employed in their system and to recommend changes or refinements in monitoring techniques based on their experience.

An initial observation based on evaluation of existing systems is that work force information, community data, and reassessment capabilities are all essential components of an effective monitoring system. In addition, it is clear that special problems in system design emerge when several projects are being developed concurrently in the same local area. Finally, a substantial and continuing commitment on the part of the sponsoring organization is essential to the successful implementation of such systems.

Work Force Information

While it is generally agreed that work force information is fundamental to a successful impact monitoring effort, substantial differences of opinion exist concerning the best method for obtaining information on worker characteristics, particularly for construction work forces. The two major alternatives appear to be (1) an entry survey in which each worker completes a brief questionnaire at the time of hiring or (2) a periodic survey in which questionnaires are distributed to all workers on a regular basis (e.g., semi-annually). Advantages of the entry survey are that high rates of worker compliance can be attained and that shifts in worker characteristics can be detected quickly, assuming that the survey responses are tabulated and reported frequently (McGinnis, 1983; Pearson, 198 1). The principal disadvantage of this approach is that some worker characteristics, such as housing type, location, and presence/absence of family members in the impact area, are likely to change during the course of a worker's tenure with the project. These changes generally would not be detected by an entry survey. In addition, unless the system provides a mechanism to identify workers who terminate their employment with the project and remove their records from the data base, worker turnover can cause the data base to become unrealistic (McGinnis, 1981).

The periodic work force survey has two major advantages over an entry survey: (1) the periodic survey has the potential to provide more accurate data on some worker characteristics (as noted above) and (2) the periodic survey is a more appropriate vehicle for evaluating project workers' utilization of and satisfaction with local services (newly hired workers may have little basis for responding to such questions). The disadvantages of the periodic survey relate

primarily to problems in implementation. Particularly during project construction, the cost (in terms of workers' time lost from their jobs) of complying with a periodic survey may appear prohibitive. Construction managers and subcontractors thus may be reluctant to cooperate in such an effort. Union officials may also be reluctant to support survey efforts. Cooperation and support from company and union officials are very important to achieving satisfactory response rates, and the attitudes of such officials must be carefully considered in designing work force monitoring procedures (McGinnis, 1983; Cross, 1980; Pearson, 1983).

Whether an entry survey or a periodic survey is employed, two factors are extremely important in designing the survey instrument. First, because the questionnaire usually must be self-administered, it must be relatively short and easily understood by the workers to achieve a high response rate. Secondly, careful attention must be given to definitions, particularly in such areas as place of residence (permanent vs. work week), place of previous residence, and family status (presence/absence of family in the impact area).

Community Impact Information

In the area of community information, the major differences among systems and critical decisions in system design relate primarily to the scope (number of indicators and jurisdictions included) and frequency of monitoring. As noted earlier, the most appropriate community indicators to monitor can be expected to differ among project sites based on both the nature of anticipated project effects (e.g., worker relocation vs. commuting) and the perceptions of local officials and their constituents concerning those effects. Existing systems differ substantially in the number of community indicators monitored, but examination of Table 4 suggests that several variables are regarded as being important in most impact situations with additional indicators apparently being incorporated in response to specific local concerns.

A general impression obtained in reviewing the monitoring reports, and supported by most interviews with monitoring personnel, is that many systems have placed too much emphasis on data collection and not enough on analysis of the information obtained. The usefulness of most systems would have been increased if greater attention had been given to evaluating the implications of the community data both in terms of impact attribution (i.e., to what extent were the observed changes the result of the project's development) and in terms of implied needs for impact mitigation measures.

Selection of communities to be monitored is a critical system design decision because the number of communities included will directly affect the cost of operating the system. It appears that the principal criterion for including a community in the monitoring effort should be the magnitude of impacts the community is expected to experience. Unfortunately, while the systems studied differ substantially in the number of communities they include, available reports generally do not explain the rationale for determining which communities would be included. Even if a definite criterion were established (e.g., include all communities anticipated to experience project-related population growth of x percent or more), recent studies indicate that predicting work force settlement-commuting patterns and hence forecasting the distribution of project-related growth have been areas in which past anticipatory impact assessments have been relatively weak (Gilmore et al., 1982). Thus, the best approach in designing a

monitoring system may be a flexible one providing for an initial selection of communities based on the anticipatory assessment but also scheduling a reevaluation of this decision as monitoring data become available. Communities could be added to or deleted from the monitoring effort based on analysis of the monitored data.

Impact Reassessment Capability

The projection updating or impact reassessment capability is clearly an important component of a monitoring system. The monitoring system personnel interviewed supported the importance of the updating feature, even those associated with the systems lacking this capability. A recurring comment was that at the time some of these systems were developed the state-of-the-art in impact modeling was still quite primitive and few well-documented, validated models were readily available (McGinnis, 198 1; Cross, 1980). Some monitoring personnel also indicated that in their particular situation a formal, computerized model did not appear necessary because impact reassessments were required very infrequently (e.g., twice in five years) (DeVeny, 1981). Overall, a review of the reports from operating systems suggests that more attention should be given to the reassessment capability. Several systems lack this feature, and even when periodic updates are provided, the methodology for developing revised projections generally is poorly documented.

Multiple Project Considerations

When several development projects concurrently affect the same area, the problems associated with impact assessment, mitigation, and monitoring are compounded. Developers' mitigation actions and communities' growth management plans can be realistic only if they are developed utilizing information concerning all proposed projects in the area. If a monitoring system is to provide useful guidance for impact management decisions, it in turn must incorporate information from all major projects. In Mercer County, North Dakota, an Inter-industry Technical Assistance Team was created to meet the need for a comprehensive monitoring system (Zainhof sky and Pearson, 1981); and the Southwest Wyoming Industrial Association has played a similar role in that state (Gilmore et al., 1982). Similar areawide monitoring systems have been developed in northwestern Colorado and in northeastern Wyoming (Campbell County) as well as in the Overthrust Belt.

Implementation Considerations

Even if an excellent system design has been achieved, several additional factors are critical to the successful implementation of a monitoring effort. First, the resources allocated for system implementation must be adequate. Several of the systems evaluated report annual operating costs in excess of $200,000. Although staffing requirements and costs of operating a monitoring system will vary depending on the scope of monitoring and frequency of reporting as well as other factors, system operating costs should not be underestimated. A second important consideration is access to necessary data. If the system will rely in part on data to be supplied by other entities (e.g., development firm, governmental agency), agreements to ensure the continuing availability of this information at the same level of detail and within the same guidelines are

essential (Krawetz, 198 la). Finally, the sponsor must have an organizational commitment to the monitoring effort sufficient to ensure the continuation of the activity through the project development period.

To summarize, several lessons can be learned from the monitoring systems that have been implemented to date. Paramount among these is the need to recognize the pivotal position of the monitoring system in the overall process of socioeconomic impact assessment and mitigation. If a monitoring system is to provide useful guidance in the impact management process, the needs of key decision makers must be carefully considered during" the system design phase, and ideally the developer and community officials who will be the principal clientele of the system should be actively involved in the design process. In addition, a systematic prioritization of information to be included in the monitoring system is vital to the ultimate success of the effort. Past monitoring programs have often been hampered by attempts to collect too much data, a large portion of which was not essential to decision making. The need for each indicator proposed for inclusion should be justified in terms of the specific purpose it will serve.

IMPLICATIONS FOR MMS SOCIOCULTURAL MONITORING

Having examined the features of monitoring systems that have been implemented in connection with a variety of large-scale development projects, attention is now focused on the socioeconomic and sociocultural monitoring needs of the Minerals Management Service. In this section, criteria for selecting socioeconomic indicators are examined, and initial recommendations concerning economic, demographic, and fiscal indicators to be included in the MMS monitoring system are presented. It must be recognized, of course, that only very general recommendations can be presented at this time, but these recommendations can be further refined as more information becomes available concerning (1) specific MMS goals and objectives for monitoring and (2) data availability.

Criteria for Selecting Socioeconomic Indicators

In selecting indicators for use in a sociocultural monitoring system, a number of criteria are obviously relevant. We suggest that four criteria are particularly important in selecting such indicators:

1. Conceptual significance
2. Sensitivity or precision
3. Policy relevance
4. Pragmatic considerations

Conceptual significance refers to the centrality of a variable within a relevant theoretical framework explaining the processes of sociocultural change. For example, in the economic realm basic employment (i.e., employment in activities which produce goods or services for sale outside the area) is an important indicator to monitor because economic base theory (upon which most models of change in local economic activity are based) specifies a strong and consistent relationship between the level of basic economic activity in an area and the level of nonbasic (local trade and service) activity. If the monitoring

system reveals substantial changes in basic economic activity, then researchers should be alerted to the probability of associated changes in nonbasic activity as well as in other indicators which are often affected by the overall level of economic activity (such as tax revenues).

The criterion of sensitivity or precision has two important dimensions. The first is the responsiveness of the indicator to underlying changes. To measure business activity, for instance, sales are typically a more sensitive indicator of local businesses' fortunes than employment. Particularly in the relatively small retail and service businesses typical of rural areas, the number of employees may remain nearly constant over a relatively wide range in sales volume. The second dimension of the sensitivity criterion is timeliness. Again the choice between sales and employment is illustrative; employment often does not respond rapidly to changes in sales volume. Rather substantial lags in employment response often are observed, particularly in small business establishments.

The third criterion, policy relevance, refers to a variable's significance in measuring the degree of achievement of policy goals or utility in suggesting appropriate policy responses. For example, because enhanced job opportunities for area residents are often a major goal of local leaders, the number and type of new job opportunities associated with a development project and the extent to which local residents will have access to these jobs are often a major issue. Monitoring the direct and indirect employment changes associated with a project, then, is often accorded high priority from a policy perspective. This example also illustrates the fact that an indicator may be ranked quite highly based on one criterion while scoring less well with respect to others. In selecting variables to include in a monitoring system, then, compromise is often necessary.

The final criterion recognizes that some consideration must be given to data availability and the costs associated with measuring certain types of indicators. Some types of data may be "nice to have," but the costs associated with their collection may be prohibitive. Thus, considerable emphasis may need to be placed on identifying indicators which can be monitored without great expense but which meet the criteria of conceptual significance, sensitivity/precision, and policy relevance discussed above.

Economic Indicators

When attention is focused on specific indicators that might be selected to measure economic change, it becomes obvious that two important information sources exist. Some types of information can be most readily (and accurately) obtained from the firms or other entities engaged in resource development activities while other types of data are most logically obtained from state agencies or community sources. The experience of previous monitoring efforts would seem to support the importance of both sources. Also, obtaining information from both developer and community sources allows for an opportunity for verification of data and generally for a triangulation of impact estimates. Accordingly, in the discussion which follows it is assumed that both developer and community sources will be used.

Development firms are best able to provide information concerning those aspects of resource development activities which tend to generate local impacts. From their records, key development firms should be able to furnish reliable

information regarding their employment in connection with specific projects, the distribution of employment by type (i.e., local hires, nonlocal commuters, nonlocal relocates), and the nature and magnitude of their expenditures to local entities. Representatives of the development firms also should be able to provide valuable insights concerning their work force and expenditure policies and the extent to which these emphasize integration with (vs. isolation from) the local economy/community.

Community and state entities will be the appropriate sources for a number. of types of information. Some types of information which would clearly be desirable to obtain on a regular basis include employment by type (e.g., fishing, petroleum-related, local trade and service), total sales by class of establishment, unemployment rates, and level and distribution of income. It appears likely that some of these data can be drawn from secondary sources, supplemented with locally derived information to aid in interpretation, while other types of information will only be available from local sources. Secondary sources of information must be scrutinized closely, however, to assure their relevance in the rural Alaska setting. In some cases, the data collection/reporting region may be so extensive that a particular data set has only limited relevance in measuring changes in socioeconomic conditions at the local level. In other cases, it is critical to know how specific data series are defined and collected (i.e., are seasonal fishing workers included?) in order to make accurate interpretations from the data.

Suggested economic indicators for consideration include the following:

Indicator	Suggested Source
Petroleum-related employment by type of job (onshore vs. offshore) and worker residence status	Development firms
Petroleum-related expenditures in local area	Development firms
Total sales of local firms, by type	State Revenue Department Local informants
Total employment by type (petroleum, fishing, local trade and service)	State Employment Service Local informants
Unemployment rates	State Employment Service Local informants
Income and income distribution	Bureau of the Census Bureau of Economic Analysis Local informants

Demographic Indicators

As with economic indicators, demographic information can be drawn both from developers and from state and community sources. The comments concerning advantages of using both sources as well as the need to carefully examine the procedures used in developing certain data series also apply here as well.

Development firms would seem to be a valuable source for information concerning their workers' demographic characteristics. Hopefully, the firms' employment records will contain information about workers' age, marital status, number of dependents, and similar characteristics. These firms could also provide information on employee turnover.

Key indicator data to be obtained from state and community sources include total population (most recent estimate) of each community, number of new housing units built since 1980 (by year built), school enrollment and dropout rate, and number of births and deaths by year.

Fiscal Indicators

Fiscal indicators are again drawn from both company and community sources. Companies could be queried concerning tax or other payments they have made to local governments or other service provision agencies (e.g., taxes on shore base facilities). Community sources should be questioned regarding

1. specific costs involved in servicing petroleum facilities (e.g., utility service for a shore base),

2. changes in (effective) local tax rates,

3. changes in numbers of local government employees,

4. changes in service structures (e.g., shift from volunteer fire department to paid firemen), and

5. Changes in bonded indebtedness.

SUMMARY

This paper has examined the important role of monitoring within the impact management framework. Monitoring can be valuable in identifying emerging problems and evaluating the effectiveness of planning processes. Several monitoring systems that have been implemented in connection with previous projects were reviewed and evaluated for the purpose of proposing guidelines for the design and implementation of a monitoring system for Alaska OCS development

Criteria for Selecting
Socioeconomic Indicators

Conceptual Significance

Sensitivity/precision

Policy relevance

Pragmatic considerations

Economic Indicators

Indicator	Suggested Source
Petroleum-related employment by type of job (onshore vs. offshore) and worker residence status	Development firms
Petroleum-related expenditures in local area	Development firms
Total sales of local firms, by type	State Revenue Department Local informants
Total employment by type (petroleum, fishing, local trade, and service)	State Employment Service Local informants
Unemployment rates	State Employment Service Local informants
Income and income distribution	Bureau of the Census Bureau of Economic Analysis Local informants

Demographic Indicators

Indicator	Suggested Source
Petroleum worker demographics - Age - Marital status - Number of dependents	Development firms
Employee turnover	Development firms
Total population of community	Census Bureau Local government estimates
New housing units	Local government
School enrollment	State Department of Public Instruction Local school superintendent
School dropout rate	Local school superintendent
Births and deaths by year	State Vital Statistics

Fiscal Indicators

Indicator	Suggested Source
Tax or other payments from petroleum firms	Development companies
Specific costs for servicing petroleum facilities	Local government
Changes in local tax rates	Local government
Changes in number of local government employees	Local government
Changes in service structure	Local government
Changes in bonded indebtedness	Local government

MONITORING SYSTEMS EXAMINED

1. Alberta Oil Sands, Fort McMurray, Alberta, Canada
2. Black Thunder Mine, Campbell County, Wyoming
3. British Columbia Hydroelectric, Canada
4. Campbell County Energy Projects, Wyoming
5. Cathedral Bluffs Shale Oil Project, Rio, Blanco County, Colorado
6. Chief Joseph Dam, Douglas County, Washington
7. Coal Creek Power Plant, McLean County, North Dakota
8. Colony Oil Shale Project, Garfield County, Colorado
9. Hartsville Nuclear Power Plants, Hartsville, Tennessee
10. Huntly Social and Economic Impact Monitoring Project, Huntly Borough, New Zealand
11. Intermountain Power Project, Millard County, Utah
12. Mercer County Energy Projects, North Dakota
13. Missouri Basin Power Project, Platte County, Wyoming
14. Ontario Hydroelectric, Atikokan, Ontario
15. Overthrust Industrial Association, Wyoming
16. Parachute Creek Shale Oil Project, Garfield County, Colorado
17. Rio Blanco County/Western Fuels Association, Colorado
18. Susquehanna Power Plant, Luzerne County, Pennsylvania
19. Washington Nuclear Project, Grays Harbor County, Washington

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APPENDIX "E"

AGENDA

SOCIOCULTURAL MONITORING METHODOLOGY WORKSHOPS

Conducted for

THE U.S. DEPARTMENT OF THE INTERIOR

MINERALS MANAGEMENT SERVICE

at

THE SHERATON HOTEL

ANCHORAGE, ALASKA

DECEMBER 16-17, 1985

by

IMPACT ASSESSMENT, INC.

SESSION SCHEDULE.

Monday, December 16, 1985

8:45	Coffee	
9:00	open sessions;	Statement of goals, introduction of Charles Wolf who will act as moderator/chair for the sessions
9:15	Chair opening remarks;	Introduction of Marsha Bennett-Walter
9:30	Marsha Bennett-Walter,	"MMS Organization and Monitoring Objectives"
10:15	Coffee break	
10:30	Chair	Introduction of Charles Smythe and Rosita Worl
10:35	Chuck Smythe/Rosita Worl	"North Slope Monitoring Methodology"
12:00	Lunch break	
1:00	Chair	Introduction of Michael Galginaitis
1:05	Michael Galginaitis	"Summary of Nuiqsut Field Test"
2:15	Coffee break	
2:30	Chair	Introduction of John Petterson
2:30	John Petterson	"Evaluation of the Nuiqsut Field Test"
3:15	Chair	Introduction of Michael Downs
3:20	Michael Downs	"A1eutian-Pribilof Applications: The Problem of the Significance of Variables in a Changing Context"
4:00	close	

Tuesday, December 17, 1985

8:45	Coffee	
9:00	Chair	Introduction of Richard Nelson
9:05	Richard Nelson	"Gavamana Suli Inuavaa? Looking at Long Term Change"
10:30	Coffee Break	
10:45	Chair	Introduction of Larry Leistritz
10:50	F. Larry Leistritz	"Monitoring socioeconomic impacts of large scale resource development: A review of recent experience in relation to monitoring sociocultural change in rural Alaska"
12:00	Lunch Break	
1:00	Chair	Introduction of William Freudenburg
1:05	William Freudenburg	"Theoretical Antidotes to the Problem of Selecting Variables"
2:30	C. P. Wolf	"Policy, Theory and Methodology in Monitoring Sociocultural Change"
4:00	Chair	Summary and closing remarks

PAPER TITLES

Monday, December 16, 1985

Marsha Bennett-Walter	"Organization of the Studies Program and MMS objectives in Monitoring Sociocultural Change in Alaska"
Charles Smythe/Rosita Worl	"Monitoring Methodology and Analysis of North Slope Institutional Response and Change 1979-1983"
Michael Galginaitis	"Summary of the Nuiqsut Field Test of The North Slope Monitoring Methodology"
John Petterson	"Evaluation of the Nuiqsut Field Test of the North Slope Monitoring Methodology"
Michael Downs	"Aleutian-Pribilof Applications: The Problem of the Significance of Variables in a Changing Context"

Tuesday, December 17,1985

Richard Nelson	"Gavamana Suli Inuavaa? Looking at Long Term Change"
F. Larry Leistritz	"Monitoring socioeconomic impacts of large scale resource development: A review of recent experience in relation to monitoring sociocultural change in rural Alaska"
William Freudenburg	"Theoretical Antidotes to the Problem of Selecting Variables"
C. P. wolf	"Policy, Theory and Methodology in Monitoring Sociocultural Change"

PAPER TITLES AND WORKSHOP TOPICS

Marsha Bennett-Walter

"Organization of the Studies Program and MMS Objectives in Monitoring Sociocultural Change in Alaska"

Throughout the course of these workshops we will be concerned with the feasibility, utility and cost of longitudinal monitoring of social change in communities affected by current and future OCS lease sales. The following reflect only a few of the initial questions we hope to address during these workshops.

1. Will the shortened list of variables utilized in the Nuiqsut field test adequately reflect changes occurring in the Aleutian-Pribilof region and in subsequent applications in other regions of Alaska?

2. What political or economic commonalities operate to link opponents of Lease Sale 92? What are the bases of these commonalities? What features of community adaptation serve to unite these communities?

3. In what senses do non-Aleutian-Pribilof organizations influence institutional change in the Aleutian-Pribilofs? And what effect will the regional "boundedness" of the current study affect consideration of these external organizational influences?

Charles Smythe and Rosita Worl

"Monitoring Methodology and Analysis of North Slope Institutional Response and Change 1979-1983"

1. To what extent are the five issues generalizable to other regions.

2. Is measurement of these five issues sufficient for monitoring sociocultural change?

3. What length of time constitutes a useful monitoring interval for these variables?

4. That is, how can these indicators be used to demonstrate thresholds of significant change?

Michael Galginaitis

"Summary of the Nuiqsut Field Test of The North Slope Monitoring Methodology"

1. Michael will respond to questions related to the "Summary" paper distributed to the workshop members. The following additional questions will be used as the workshop focus if sufficient time remains in the period.

2. How can we improve our use of unobtrusive measures? For example, what additional kinds of analytic conclusions can be drawn from the detailed house-by-house census material, spatial organization, local commercial activities, physical inventories and community facilities collected in our field stay in Nuiqsut?

3. To what extent can we maintain a regional focus while conducting a community study, or a study from within a single community? For example, in Nuiqsut the Native/non-Native distinction is mainly one between teachers and local residents. At the regional level, however, the Native/non-Native issue can be expected to continue to evolve in complexity as the number of non-Natives increases. At the regional level this is a significant political issue. How can we specify at what level of analysis a particular process of social change will be examined?

4. To what extent can we expect the shift in political control at the regional level to affect outlying North Slope communities? For example, will the election of a non-Native mayor result in a downgrading of emphasis on outlying native villages (which currently hold a high political priority) on the regional political agenda? How can such changes be anticipated or accommodated in the design of a monitoring methodology?

5. How can we reconcile the research need to obtain important information from key informants (often involving sensitive issues) within the limits of informant confidentiality? Especially within the time constraints of a periodic monitoring program?

John Petterson

"Evaluation of the Nuiqsut Field Test of the North Slope Monitoring Methodology"

1. John will respond to questions related to the "Technical Evaluation" paper distributed to the workshop members. The following additional questions will be used as the workshop focus if sufficient time remains in the period.

2. Should the sociocultural monitoring program continue to concentrate on assessments of change or should additional emphasis be placed on assignment of causes and associated effects?

3. To what degree does current knowledge allow the differentiation of one cause from another? That is, should we, in the monitoring process, attempt to tie particular effects to particular causes? If not, how should we go about grouping effects?

4. From the MMS perspective, how much emphasis should be placed on differentiating the effects of OCS leasing from the multitude of unrelated causes? Can we assign relative weights to the incremental effects of OCS development?

Michael Downs

"Aleutian-Pribilof Applications: The Problem of the Significance of Variables in a Changing Context"

1. How does one formulate a constellation of variables so that the influence of several background variables can be addressed when studying the influence of the primary study variable?

2. Is there a focal social complex in every community, similar to the "whaling complex" on the North Slope, that is seemingly tied to all other aspects of social organization?

3. How does one determine whether certain variables are central or peripheral to the social organization of the community, which in turn will determine the community's response to other vectors of change?

4. Can one develop a "gestalt" of the study community (or region) against which change will be measured, and how does one then monitor shifts in that gestalt?

Richard Nelson

"Gavamana Suli Inuavaa? Looking Long Term Change"

1. Is a focus on formal institutions an adequate means to monitor sociocultural change within native alaska communities?

2. Should protocols include a broader range of social and cultural patterns from outside the institutional context (e.g., subsistence activities, world view, religion and ceremony, language and personality)

3. To what extend should community member's judgement of the amount or significance of change be incorporated into the monitoring process? How prominent should local assessments of change be in reports from monitoring research?

4. To what extent do quantifiable items provide a measure of sociocultural change? Is the amount of change ultimately a qualitative judgement, whether it is based on quantified data or not?

5. What constitutes an adequate and appropriate time span for measuring or assessing change? Are there methods which can extend our perspective on the rate and breadth of change in a community--to encompass periods of 25 or 50 years rather than a few years or a decade.

F. Larry Leistritz

"Monitoring socioeconomic impacts of large scale resource development: A review of recent experience in relation to monitoring sociocultural change in rural Alaska"

1. What are most appropriate goals for an OCS monitoring program? What are the ultimate objectives of the program and how can these best be translated into a monitoring program?

2. What are the policy, implementation, compliance, local support and mitigative implications of short- and long-term findings?

3. What criteria should be utilized in selecting socioeconomic indicators? Which indicators fit these criteria in the economic sphere? Which indicators fit these criteria in the demographic sphere? Which indicators fit these criteria in the fiscal sphere?

4. Which variables, selected from the established literature, have proven to be the most sensitive indicators of socioeconomic or institutional change?

5. What are the pitfalls of establishing a monitoring methodology? That is, which variables have proved to be too inclusive, too time consuming or too costly to utilize effectively in a monitoring program? From previous experience, how do we select representative communities, determine entities to be monitored, narrow the number of indices utilized, or establish a hierarchy of important variables?

William Freudenburg

"Theoretical Antidotes to the Problem of Selecting Variables"

1. How do we determine the appropriate "richness-succinctness trade-off?" That is, to what extent are we willing to exchange richness of ethnographic detail for the more formalized summarization of salient findings? And by which criteria is this decision to be made?

2. The tendency has been to document what is countable rather than to determine which measures best reflect significant or important changes. What important theoretical or logical concerns should orient the selection of variables and collection of field data? For example, what variables have specifiable linkages to well-being?

3. One of the methodological problems in field data collection has been the issue of representativeness--i. e., a sampling bias. Who are appropriate sources of information and how can we avoid the problem of the elite bias? Under what conditions should we assure that women, unemployed, and other so-called "untitled" members of the community be sought as data sources?

4. The North Slope protocols, and protocols in general, presume certain answers. How should we design data collection instruments which avoid the inherent limitations of protocols yet assure that the research collects sufficient suitable information for the intended analysis?

5. How replicable is the general approach of the North Slope monitoring methodology?

6. What is the MMS perspective vis-a-vis confounding variables in their analysis of the effects of OCS development?

C. P. wolf

"Policy, Theory and Methodology in Monitoring Sociocultural Change"

1. What are the important policy questions which should be answered before development objectives are defined and implemented? To what extent are there inherent contradictions in development policy objectives? To what extent are our development policies creating inherently unstable social and economic conditions in rural Alaskan communities? What are the development agency's responsibilities in regard to the creation of "culturally dependent development?"

2. Upon what theoretical grounds do we base our calibration of assessment methodologies? That is, how do we accommodate cultural variability in the selection of appropriate monitoring methodologies? What kinds of systematic variation in cultural settings influence the selection of appropriate methodologies? That is, how do we create a culturally sensitive measuring system that will allow testing of impact hypothesis?

3. Methodological issues include the problem of rapid rural assessment and the tension between etic and emit interpretations of reality. That is, how do we design a field data collection procedure which can assure collection of sufficient information to satisfy the monitoring objectives without relying on an extensive field period and participant observation techniques? Given such limitations, how do we accommodate the increasing difference between local and "expert" interpretations of the course of change in the community?

4. How do we differentiate between lease sale effects and those resulting from unrelated causes?

5. How do we go about identifying "regional publics" in an area as diverse as the Aleutian-Pribilof region?