

Exxon Valdez Oil Spill, Cleanup, and Litigation:
A Collection of Social-Impacts Information and Analysis

Final Report, Volume III:
Final Social Factors

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1.0 THE EXXON VALDEZ OIL SPILL EVENT AND SOCIAL FACTORS

Social factors are the focus for our analysis of the community impacts of the *Exxon Valdez* oil spill, cleanup, and litigation. In this document we present a discussion of the derivation of social factors, how these factors will be used, a summary of types of community impacts, and a revised list of social factors and their components. For our purposes here, social factors are major categories of sociocultural variables such as social organization, culture, or subsistence. Each social factor has components such as political organization for social organization, beliefs and values for culture, and harvest activities for subsistence. Social factors will organize our analysis of the relationship between the *Exxon Valdez* oil spill (EVOS) event and its community impacts. Individual components of particular social factors will assist in describing how any one category contributed to different effects across the impacted communities.

1.1 SOURCES FOR THE DERIVATION OF SOCIAL FACTORS

We define “social factors” as a structure (social, cultural, or economic) or process (social or cultural) within communities that organizes and makes meaningful individual and group experience. For example, “social structure” is a social factor comprised of specific social institutions, their connections, and processes. We have identified social factors by the examination of the literature regarding the oil spill and the literature about technological disasters in general. The literature about the oil spill and its aftermath describes an array of social, economic, psychological, cultural, and physical impacts (e.g., Impact Assessment, Inc. [IAI] 1990d; Picou, Gill and Cohen 1997). In the factor by factor analysis, we will present a thorough summary of these impacts. Our listing of social factors has also been informed by, and examination of, the literature about other “technological disasters.” This literature places the EVOS event within a wider frame of social problems and phenomenon (e.g., Kroll-Smith and Couch 1990; Edelstein 1988; Dunlap, Kraft, and Rosa 1993; Couch and Kroll-Smith 1991). We use this literature to generate concepts that apply to similar events, but which may not be fully described or analyzed in literature about the EVOS event itself. For example, perceived risk (Slovic 1987) and the social amplification of risk (Kasperson et al. 1988) are sub-topics within this literature that we found useful to describe social and cultural factors for the EVOS.

The Annotated Bibliography and Abstracts represents the range of literature about the EVOS event we have used as a major source of information for our derivation of social factors. As this bibliography demonstrates, the literature about the event itself is highly varied in the scope, methods, communities, and issues examined. Some work (e.g., Picou 1992) focuses on one or two communities and a subset of the full-range of impacts associated with the event. Other work includes a number and diversity of impacted communities and examines a range of psychological, social, economic, and municipal effects (e.g., IAI 1990d). Some research is broad in its geographic range and diversity of communities examined and also rich in descriptions of event effects and local context, but is limited in its analysis of “why” these effects occurred (e.g., Minerals Management Service Technical Report 160). Other information from popular literature and news sources tends to be descriptive of effects, but often without the contextual factors or analysis that would aid in the specification of social factors. Consequently, our task has been to sift through these diverse sources to derive social factors that cover the full range of circumstances related to the event. Not all social factors apply to all communities. Indeed, examination of the literature suggests that community effects are related to the configuration of components of particular social factors and to the interactions among factors in diverse communities. Consequently, we have cast a broad net to identify social factors that apply to the widest set of circumstances, and we also identify components of these factors to assist in accounting for the diversity of impacts among communities from Prince William Sound to Kodiak and the Alaska Peninsula.

Another consideration is the phases of the event covered by most of the systematic research about the EVOS event (e.g., IAI 1990; Russell et al. 1996; Picou, Gill, and Cohen 1997). Most of the work addresses effects related to the spill and cleanup during the first two or, at most, three years following the spill. Effects related to restoration and litigation are minimally addressed by research that extended much beyond two or three years after the spill. This leaves out a considerable number of events related to restoration and litigation that have received media coverage, but media coverage is not systematic enough for the analysis we would like to see performed for these crucial phases of the EVOS event. Consequently, the social factors we derive from the literature may not cover the full-range of applicable circumstances, especially those concerning restoration and litigation.

A second major source for our derivation of social factors is the literature about other types of technological disasters. In recent years, this area of scientific research has increased in the kinds of events examined and in the sorts of issues considered and the way that the technological aspects of these disasters make them different, in course and social consequences, than natural disasters (e.g., Drabek 1986). The examination of chemical spills, siting of hazardous facilities, mine fires and other similar human-made circumstances has brought attention to the social impacts that follow technological disasters as well as to the role of social factors in influencing event outcomes. This literature indicates several important types of sociocultural features and effects of technological disasters that are a backdrop for our identification of social factors. Among these features are: (1) discourse about event characteristics, as well as blame and responsibility for the event occurrence, leading to a lack of public consensus on answers to these questions ; (2) pollution fears and concerns about health effects from the event; (3) perceptions of a polluted and changed physical environment; (4) assessments of “home” as a changed and damaged place; (5) emergence of social groups that take activist positions about environmental issues; (6) social conflict and divisiveness; (7) damaged community bonds and social processes; (8) loss of trust in governmental and corporate institutions; (9) family and individual stress responses; (10) changes in community participation; and, (11) changes in local political and community leadership. In technological disasters it is not uncommon for community divisions and distrust to develop over alliance with the entity blamed for the disaster, and for disagreements to emerge about solutions. The consequent damage to community bonds often spawns the chaotic effects that seem to characterize technological disasters (cf. Erikson 1994). Since less is known, or widely known, about the long term health effects associated with exposures in technological disasters, enduring health fears and uncertainty about contamination and exposure are not uncommon. Further, in technological disasters, cultural, social, and psychological factors often interact and have compounding effects, subverting the traditional ‘therapeutic community’ that may develop following natural disasters. Thus the community’s perception of disaster as technological in origin may, itself, be a critical social factor configuring and amplifying social effects.

For our purposes, the literature about technological disasters places the EVOS event within a context of similar events. It allows us to use these other events to examine issues that may not necessary be examined by specific pieces of literature about the event, but when the total range of data available are assembled we can suggest social factors derived from analysis of similar events.

1.2 THE USE OF SOCIAL FACTORS FOR ASSESSING COMMUNITY IMPACTS

The identification of social factors is in part informed by how they will be used in the factor-by-factor analysis. Here we wish to describe briefly (1) an approach for analysis of the relationships between event context, social factors, and community impacts and (2) how the factor-by-factor analysis will be implemented.

1.2.1 An Analytic Approach for the Use of Social Factors

Our analytic approach to the analysis of the role of social factors in effecting community impacts is to assess the relationship between community impacts, social factors, and “event context” (characteristics of the event and biophysical characteristics of community environment). Our approach has the working assumption that social factors mediated between the event context and community impacts. That is, the EVOS event outcomes are a consequence of how specific context characteristics interact with the structures and processes of particular communities. In these interactions, the configuration of social factors, in particular, communities, may have produced different effects through exposure to the same event characteristics. For example, subsistence resources used by both Natives and non-Natives were damaged. These damages had similar functional effects, depriving individuals and families of subsistence food resources. However, the cultural meanings of subsistence resources (for example, research in some Native Alaskan communities has noted that the traditional exchange and sharing of wild foods hunted, fished, or gathered by individuals and families is an important link in the maintenance of community bonds and the fulfillment of social responsibilities) differs in Native and non-Native communities and thereby resulted in different effects. We will thus use social factors as a way to analyze how variable community effects were produced from exposure to the characteristics of the EVOS event.

1.2.2 Implementation of the Factor-by-Factor Analysis

Social impacts of the EVOS event were not uniform, and differed in severity, kind, and duration from one community to another. Our description of the application of each factor emphasizes how data will be aggregated from the literature to analyze how these factors mediated different outcomes from the oil spill, cleanup, and litigation. This analysis has two parts. The first considers each individual social factor and its relevant components, assessing how each mediated exposure to the oil spill and community impacts. The second considers the interactions among social factors and their components as they mediate community impacts.

The purpose of the factor-by-factor analysis is to provide resource managers and community members with an understanding of how particular social variables contributed to community impacts associated with the *Exxon Valdez* oil spill, cleanup, and litigation. For example, interested parties will be able to read an analysis of social structure and its components to understand how these contributed to the overall patterning and distribution of community impacts. This analysis will be completed by aggregating and synthesizing the literature cited in the bibliography. Codes will be assigned to the literature examined for the presence of a social factor and its components. We will then aggregate the relevant information and analyze how each social factor contributed to community impacts.

This analysis will first categorize the aggregated information for each factor and then examine the themes and issues regarding the relationship between oil spill events, environmental context, and community impacts. Each source used in the analysis will be indexed so that the basis is clear for the interpretations and conclusions in the social factor analysis. Additionally, this factor-by-factor analysis will assess the relative priority of social factors affecting community impacts. This priority analysis will consider intensity of impacts, effects on population sub-groups (Natives, fishermen, cleanup workers), and the range of communities impacted.

Individual social factors interact with each other (e.g., culture and social organization), in most contexts to influence or determine the meanings and processes of social life. The factor by analysis will also consider interactions among each factor and its components identified for this study. Based on our review of the literature so far and our review of the literature regarding technological disasters, we expect that this analysis will illustrate how interactions among social factors contribute to outcomes that are not accounted for by any single social factor. Additionally, we expect the patterning of relationships among factors will also account for variation among communities in the impacts experienced when the

“exposure” and context conditions seem similar. Our focus will be to connect the interactions among social factors with outcomes related to phases and conditions of the EVOS event.

1.3 SOCIAL FACTORS AND TECHNOLOGICAL DISASTERS

It was apparent to those who lived in the communities in the path of the spill that the threat to their environment was also a threat to their way of life, to their expectations about a future, and the connection of that future with their past. None of the rhetoric about the volume of oil spilled, or the number of otter and bird deaths, could overshadow the difficulties of the people of Prince William Sound, Kodiak Island and the Gulf of Alaska who experienced the *Exxon Valdez* oil spill as a calamity thrust upon their lives and future. In terms of sociocultural effects, the cleanup effort and litigation phase are as important as the primary spill event itself. As time has passed and more research has emerged, the EVOS event has become an exemplar of a type of disaster in which individuals, families, and entire communities experience not only the relatively short-term immediate physical effects of the disaster itself, but also more long-term social and psychological distress generated by the ambiguous nature of the disaster event and the variety of responses to it. This “new species of trouble” as Kai Erikson labels it creates uncertainty, dread, and a changed relationship of individuals and communities with their environment. As Erikson observes,

. . . when the dread is lasting and pronounced, the spectacle of a failed technology can become the spectacle of a failed environment as well. This is an outlook born of the sense that poisons are now lodged in the tissues of the body, that the surrounding country-side is contaminated as well, that the whole natural envelope in which people live out their lives has become defiled and unreliable (Erikson: 1991: 24).

Yet, in this new species of trouble – the technological disaster – it is not only the environment, the natural envelope of human experience, that has become unreliable, but also many of the social institutions and processes upon which communities rely for social cohesiveness and support. Indeed, a reading of the technological disaster literature suggests that a defining characteristic of these events is damage to community, to individuals, to ways of life, and to the worldviews that attribute meaning to human experience (Shilnyk 1985). This loss of, or damage to, the sense of community, the loss of trust in government and corporate institutions, and the disruption of ‘lifescapes’ in technological disasters have consequences that social scientists have described (Edelstein 1988). Again, Erikson in commenting on the mercury poisoning of waters used by an Ojibwa community has a meaningful observation about damage to community institutions and processes:

When survivors suffer from loss of community as well as from individual shock, it is not just a question of getting them back on their feet but of seeing to it that there is some kind of communal ground, as it were, for them to stand on once they are upright. We can dress their physical wounds, provide food and shelter and clothing, console them for their losses, ease their grief, find ways to calm their anxieties. But until we restore the communal surroundings that was so vital to their sense of health and security, they will remain like refugees in their own land, damaged in spirit long after they have been put together again in body, and feeling a long way from home (Erikson 1985:xvii in Shilnyk 1985).

The trauma suffered by individuals from such events becomes compounded when the processes of community are also damaged. Traditional support systems become less efficient or unavailable and other community resources that protect communities from being overwhelmed by disasters are undermined. Individuals and communities become at risk for compounded social and psychological effects that seem unpredictable. Indeed, it is this compounding of individual and community effects that often leads to the

sense of chaos that pervades these events, that contributes to unexpected outcomes and disruption in community life. Yet, in the case of the EVOS event, patterns were seen in its community impacts. What may have been unexpected at the community level can, in retrospect, be understood from an analytic perspective, and this is where social factors analysis can assist in facilitating understanding of events and processes associated with the EVOS event.

1.4 THE *EXXON VALDEZ* AS A TECHNOLOGICAL DISASTER

In a number of communities, the oil spilled from the wrecked *Exxon Valdez* altered the lives of many Alaskans just as surely it as blackened beaches and damaged wild resources. The spill and subsequent related events generated social impacts at all levels within the social structure or organization. In addition to having an influence on individuals, the spill and associated events altered community activities, and the relationships between individuals and groups in communities. For example, because of the oil spill and cleanup, fishermen did not fish and Native Alaskan subsistence hunters did not hunt, influencing all of the relationships that intertwine with these activities. Others experienced their lives as forever changed for a variety of reasons. Some businesses lost money while others gained large profits, creating 'spillionaires' out of, for example, former plumbers, fishermen, and refrigerator repairmen who went to work on the cleanup effort. Friends and neighbors sometimes argued over differences about the spill, and especially the 'morality' of working for Exxon (who paid for and ultimately organized the cleanup effort), creating (or exacerbating) social divisions between neighbors and former friends. Others argued over inequities in opportunities, and money lost and gained in the cleanup effort. On the family level, parents and children argued over the same issues. On the individual level, some persons experienced depression, anxiety, post-traumatic stress disorder, and other types of clinical disorders while others were angry, fearful, and, in their words, "stressed." People in both Native and non-Native communities were concerned about the toxic effects of the spilled oil.

For communities in the path of the oil spill, as well as for some near the path that experienced damage to their resource base, such individual and social tensions were among the pervasive consequences of the EVOS event. Yet, in the early days of the spill, the focus of attention by the media, the spiller, and various governmental entities was on natural resources damages. Indeed, to the world at large, the spill has become known solely as an 'environmental disaster.' Most Exxon Valdez Trustee Council studies (whether damage assessment or aimed at restoration) focus on the oil spill event itself as the cause for effects upon biological (natural) resources. Although both cleanup efforts and litigation phases had the potential to effect biological/ecological resources, Exxon Valdez Trustee Council studies and projects more-or-less ignore such potential effects (archaeological studies did assess the effect of cleanup efforts on cultural resources). No Exxon Valdez Trustee Council study focuses on the litigation phase, and effects on the human population of Prince William Sound have more generally not been examined.

It is also important to recognize that there have been other types of social impacts in communities that may or may not have experienced the acute social disruption found in some spill area communities. An example of this are the continuing social impacts that are being generated by the 'restoration' process, whereby land status is changing, altering relationships between communities, and groups within communities, and the local resource base. Not all social impacts have been seen as negative by any means, nor have 'new' social impacts stopped occurring nearly a decade after the spill.

What is essential about the EVOS event as a technological disaster is its effects on human communities. Natural resource damages were, and are, significant, but communities also have economic, social, cultural, and spiritual relationships with those resources. As we have noted earlier, the literature about technological disasters suggests that social characteristics and processes of particular communities effects how impacts are experienced. We wish to emphasize here that our analysis of the relationship of

exposure to the EVOS event and community impacts will emphasize how social factors and their components contributed to the patterning and distribution of impacts experienced.

1.5 THE DISTRIBUTION OF COMMUNITY IMPACTS AND SOCIAL FACTORS

The EVOS event altered social processes and relationships in Alaskan communities, but how these changed varied from community to community. Indeed, there was a continuum of experience where some communities experienced the spill as ‘socially corrosive’ while in others the effects were perceived as short term and only minimally disruptive. Despite the environmental and social damages of the EVOS event, there are perceptions that there were positive community outcomes including infrastructure development, habitat protection, acquisition of new lands for habitat protection, increased environmental awareness, and renewed interest in participation in community leadership. An understanding of the variation in the patterning of impacts and in the role of social factors in contributing to these patterns and their variations is essential to our analysis.

In some communities the EVOS event was extremely divisive. The ‘social turbulence’ (the disruption of community functions and relationships) that accompanied the event was in some cases related to the issues of blame and responsibility. A discourse developed among community members and groups about what was right and wrong, what was moral and what was reprehensible. This type of discourse was especially present during the cleanup and litigation phases. As an example, one theme that was prevalent during the cleanup in Kodiak, Cordova, and Homer concerned the ‘morality’ of accepting what was sometimes termed ‘Exxon blood money.’ A community dialog develop among those who became labeled ‘purists’ and those who were labeled as ‘realists.’ The purists argued that accepting any money from Exxon was immoral because the intent of Exxon offering high paying jobs was to ‘pay off’ local residents and to keep them quiet. From the point of view of the ‘purists,’ those who took such money were accepting money for unacceptable behaviors, and the label ‘Exxon whores’ came into use. On the other hand, the ‘realists’ perceived their livelihood and economic future as threatened. Mortgages and boat payments had to be paid and food put on the table. It was necessary to take Exxon's money to survive, even if the cleanup effort did not appear to be a sincere or an effective undertaking. The realists and purists often engaged in acrimonious public debates about the morality of their respective positions. A consequence of these debates was divisiveness that loosened the bonds among individuals and diminished the overall sense of community.

Although diverse communities experienced a social impact such as “community disruption” the processes that generated such disruption varied. In some communities disruption was the result of moral discourse about the cleanup while in others it was the bleeding off of leadership to work on the cleanup, or the interruption of usual patterns of social interaction. An important analytic task of this project is to clarify the reasons for these chaotic circumstances and their distribution among Alaskan communities (as well as show how what was socially chaotic on the ground was part of a pattern when viewed from a larger or more distant perspective). To accomplish this analysis we will analyze particular social factors and the patterns of relationships among social factors.

2.0 SOCIAL FACTOR CATEGORIES

Social factors, the structures and processes with a specific configuration that construct a particular community, are the organizing concept for the factor-by-factor analysis and the basis for subsequent recommendations to natural resource managers. In this section we list specific social factors and their component parts that we expect to use in the factor-by-factor analysis. However, we also expect that this is a working list that will be revised as we examine the literature in more detail and discover new, or delete those, factors or components that do not contribute to understanding community impacts and their distribution. We also identify here two “context factors” – biophysical adaptation and event

characteristics – which are essential to understanding how social factors mediated community impacts. We first describe each of the two context factors and then list the social factors to be used in the factor-by-factor analysis.

2.1 CONTEXT FACTORS

“Context factors” are different from “social factors.” Context factors address characteristics and processes of an environment which are external to community sociocultural characteristics. Social factors emphasize the internal configuration of sociocultural structures and processes in a community whereas context factors emphasize a set of “external” environmental conditions and events to which communities adapt. Context factors, like social factors, exhibit variability. For example, the availability of fish resources is a common context factor for coastal Alaskan communities, but the distribution and availability of specific resources to particular communities is variable. Similarly, the duration of the oil spill as an event was roughly the same for all communities, but the oiling of community beaches and property exhibited much more variability. Our analysis of the context factors will focus on defining the components which characterize the EVOS event and the biophysical adaptations of communities that are essential to understanding community impacts.

2.1.1 Biophysical Environment and Natural Resource Cycles

Natural resources and their annual cycles of availability are critically important for Alaskan rural communities. Indeed, the presence and availability of natural resources set conditions to which communities adapt, and these adaptations, in part, structure community life. Economic institutions and processes, cycles of harvest activities, community festivals and celebrations, values about important resources, and the organization of individual and community time and activity are examples of how adaptations to natural resource cycles and their biophysical context structure life in Alaskan communities. The most obvious use patterns are encompassed by such terms as “subsistence,” “logging,” “commercial fishing,” and “tourism.” Each of these represents a community adaptation to the presence and use of particular natural resources and their cycles. Any event that disrupts a particular environmental context and its natural resources is likely to result in impacts to communities that depend on those resources. Consequently, an understanding of the biophysical context and adaptations of Alaskan communities is a key factor for assessing community impacts of the EVOS event.

Components of Biophysical Context

Patterns of Resource Use

- C availability and diversity of resources used
- C activities associated with resource availability
- C patterns and cycles of resource use
- C community dependency on resources used
- C preferences and alternatives in resource use

Social and Cultural Significance of Resources Used

- C institutional significance
- C economic importance of resources to community
- C lifestyle significance of resources used

2.1.2 Event Characteristics

The EVOS was not a single event that was experienced in the same way by all individuals and communities. Rather, some places were oiled more than others, some fisheries were disrupted and others were not, some community’s food supplies were threatened and others were not, cleanup activities varied

in duration and structure, and some never saw an oiled bird or otter whereas others witnessed truck loads of dead birds, otters, and other wildlife. The event also has phases (the initial spill, the organization and implementation of a privatized cleanup, litigation, and restoration) that have affected communities and individuals differentially. Some communities experienced the spill as the most disruptive and destructive phase of the event while for others it was the cleanup, and in still others, restoration is perhaps having some of the most long lasting effects. An assessment of event characteristics sets the conditions for response by the natural and social environments of Prince William Sound and the Gulf of Alaska.

Component Factors:

Oil Spill Event Characteristics

- C timing of event occurrence
- C threats to resources and human health
- C duration of the event
- C event phases
- C natural and community resources damaged
- C uncertainty about effects and outcomes
- C blame and responsibility

Conditions of Exposure

- C physically oiled
- C fishing grounds oiled
- C lifestyle and social disruption
- C media exposure
- C cleanup participation
- C social exposure, i.e. experiencing the event through others in the community

Characteristics of the Cleanup

- C structure and organization of a privatized cleanup
- C local control and privatization
- C economic benefits and losses
- C effectiveness
- C duration

This listing of variables for describing event characteristics will require fine-tuning as we sift through the literature to extract those features which can effectively and economically capture the conditions to which Alaskan rural communities had to adapt. However, the major sub-categories of event characteristics, conditions of exposure, and cleanup characteristics offer a framework that should allow us to effectively describe how this event interacted with the sociocultural characteristics of Alaskan rural communities in the spill-affected region.

2.2 SOCIAL ORGANIZATION

“Social organization” as a concept, describes the configuration of community social elements and their interconnections. This includes demographic, political, economic, religious, and other formal social institutions, as well as, less formal ones such as kinship and friendship networks, and voluntary organizations. The following components of social factors will be used in the factor-by-factor analysis.

Demographic characteristics: Some of the most common correlates of differential sociocultural effects are demographic social factors. Demographic social factors combine biological properties of human populations with some social constructions – age, sex, ethnicity, absolute population size, residency, and immigration/emigration.

Component Factors

Population

- C size
- C permanent versus seasonal residency
- C sex/gender
- C age
- C immigration/emigration

Ethnicity of community

- C Native
- C Non-Native
- C plural

Political structure: the formal political organization of communities affects the types of resources communities have available to respond to events such as the EVOS event and their ability to access and/or mobilize non-local resources. Typically, Alaskan rural communities range from minimal formal political structure (no incorporated civil structure, no tribal organization) to complex organizational structures (city/village civil council, traditional/tribal council, IRA [Indian Reorganization Act] council, formal representation in borough assembly, other local representational groups). Some unincorporated Alaskan communities with no formal government may still operate under a cooperative home owners association or through a voluntary organization such as a local sportsmen’s club or service organization. An additional aspect of a community’s political structure is the degree of communication and the ease of coordination between political/governmental entities, since it may affect their ability to mobilize resources quickly.

Component Factors

- C incorporated municipality (village/city)
- C unincorporated community
- C part of organized borough/outside of organized borough
- C tribal council (traditional/Indian Reorganization Act)
- C quasi-governmental entities (Native [Alaska Native Claims Settlement Act] corporations, home owners associations, local voluntary organizations that operate as a coordinating body)
- C site for county, state, federal offices

Leadership: the breadth and depth of leadership resources influences the ability of a community to organize and implement a response to an event such as the oil spill. Some leadership resources are individuals who step forward and take responsibility during a crisis. Other resources exist in the formal institutions of a community such as the role of mayor or the chairman of a tribal council. Still other resources are organization, such as a fisherman’s union or chamber of commerce. Our consideration of

leadership will include the range of individual and institutional resources that emerged during the EVOS event and influenced the nature of community impacts.

Component Factors

- C presence and availability of institutional leadership resources
- C presence and availability of community-based resources
- C emergence of individual leaders
- C leadership burn-out
- C post-event presence and availability of leadership resources

Multiplex social ties: where social ties overlap (i.e. are multiplex) rather than single interest, then the potential for certain types of effects increases. Multiplex social ties more commonly characterize smaller, more rural, communities and are especially prevalent in rural Alaskan communities, including Native communities. Populations tend to be small, limiting the “bodies” available to fill the social roles required for a functioning community. The smaller the available pool of people, the more likely it is that each will serve in several roles (wear more than one hat) and the more multiplex social interactions there will be. These types of ties are important for the social factor analysis because they dominate the character of face-to-face relationships in community life, an essential factor for assessing community impacts of the EVOS event.

Component Factors

- C role of multiplex social ties in community leadership
- C multiplex social ties community-wide
- C role of multiplex ties in affecting community conflict and cooperation

Kinship: this is a major documented organizing principle of social life in Native communities, and is important in non-Native communities as well (although usually more on an individual rather than an institutional basis). Although not as well documented, kinship (and quasi-kinship) networks certainly affected the patterns of response to the spill event in other rural Alaskan communities as well. “Kinship” could be included as a social factor under any of the previous headings, as it is fundamentally based upon demographic information (biological relationships of individuals), it often creates multiplex ties between people and families, and is commonly a central factor in community political structure and leadership. Kinship is also often a central mechanism for the distribution of resources and information within (and between) communities.

“Kinship” as a concept is seldom absolute in any social context – in any behavioral context it is often fuzzy and ranges on a continuum from 100 percent connected to a very distant cousin indeed. People are quite inventive with kinship relations, and different researchers have examined kinship as a social factor in different ways. The expectations and obligations entailed in kinship relationships can affect the social consequences associated with a disaster: For example, research in Native communities has indicated that the EVOS event made it difficult for people to fulfill their obligations to share subsistence resources with elderly kin, and disrupted these systems of kin support. And research on technological threats and disasters indicates that the presence of certain kinship ties, such as being a parent with young children, increases a person’s perception that the event is serious and threatening.

Component Factors

- C kinship-based community institutions/organizations – formal/informal
- C kinship-based sharing
- C kinship-based economic activity
- C role of kinship in buffering event related effects

Community cohesiveness: the social solidarity within communities, the degree of “close-knit” patterns of association and interaction, is a factor that affects the availability of social support and the overall ability of communities to respond to disaster events.

Component Factors

- C existing divisiveness
- C history of prior actions of community support in crises
- C institutional/organizational focus for community support
- C patterns of association and interaction that provide a basis for community action in crises

Organizational resources (other than formal political structures): formal and informal organizational resources are often mobilized in disaster events to coordinate responses, communicate about ongoing events, and to provide resources to the community in the process of recovery. These can be organizations formally charged with disaster response-like activities (Search and Rescue, Fire Department, Emergency Response Team) or those with no apparent link to such activities (Lions Club, Chamber of Commerce). This is an important social factor that applies to all of the communities affected by the EVOS event.

Component Factors

- C community institutional/organizational inventory
- C past disaster event experience
- C explicit existing emergency response plans
- C participation in Exxon Valdez Trustee Council process
- C participation in regional organizations (Regional Citizen’s Advisory Council, etc.)

Extra-community resources: the ability to extend within-community resources by drawing on linkages with other communities and other private and political entities can expand the infrastructure, expertise, and material resources brought to bear in a disaster. Few communities have the resources on hand to manage major disasters, and therefore, the access to additional resources, often achieved through persons or organizations with wider connections, can moderate impacts.

Component Factors

- C community provides local headquarters for national or state businesses/government offices
- C access to extra-community resources through community members
- C community is a place of interest/value to those outside the community

Information/communication resources: the ability of communities to discover what is happening in a disaster, to communicate that to its citizens in a manner considered reliable and trustworthy, and then to provide communication channels to its citizens and other affected parties is a social factor that influences the effects experienced in these types of events. The timeliness with which information is gathered and disseminated can affect a community’s ability to respond to and prevent some of the damaging

consequences of a disaster. This is certainly related to organizational resources available to facilitate information gathering and communication.

Component Factors:

- C existence of local media (radio, television, newspaper, other)
- C existence of local infrastructure (roads, boardwalks, sidewalks, piers, airstrips) and physical continuity of the community
- C existence of local regular meeting groups (church, governing bodies, discussion groups)
- C local membership in regional, state, and national voluntary organizations
- C actions to disseminate information about EVOS event issues

Legal resources: technological disaster events often involve the issues of blame, responsibility, and legal action. Access to legal resources by communities and individuals within communities can affect the overall impacts experienced. The availability of other kinds of expertise can also serve to moderate impacts, though the kinds of expertise needed may be particular to the disaster. Those capable of providing expertise may be involved in direct work on the disaster. In the EVOS event case, municipal work, health and mental health expertise, child care provision, accounting, and prior experience in managing large operations and responding to disasters were skills sought.

Component Factors:

- C local legal expertise
- C prior local legal experience
- C locally perceived interests
- C unity of locally perceived interests
- C locally perceived conflicts of interest
- C local financial resources to provide for legal representation

Emergent organizations: these types of groups characterize responses to technological disasters in general and they were salient within communities exposed to the EVOS event. These groups can act to foment social conflict and also to provide social support to members of impacted communities. Most of the literature on technological disasters mentions the formation of citizen organizations designed to provide information on the course of the disaster and propose solutions, and to hold accountable those considered responsible. Often, the formation of emergent organizations occurs when public/governmental action or the provision of information is considered inadequate or untrustworthy. There are also instances, such as that described in Seward, Alaska (IAI 1990 [Final Report]), in which organizations arise after an event to coordinate response to the disaster, and they act to increase the effectiveness of existing organizational structures.

Component Factors

- C volunteer or government organizations formed to respond to the event
- C stated functions of emergent organizations, including advocacy (such as social, environmental, and oil industry advocacy), litigation, information dissemination, oversight, resource collection and distribution, cleanup activities, and provision of organizational structure and coordination
- C activism of emergent organizations, including high, medium, and low levels of activism
- C post-event persistence of organizations and their community role

Litigation participation: this factor can act to increase social tensions and divisiveness as well as to promote social solidarity among some individuals within communities.

Component Factors

- C individual or group lawsuit
- C target of lawsuit (such as federal government, Exxon Corporation, other community members)
- C duration of lawsuit

Oil industry participation: this factor applies specifically to Valdez and to communities on the Kenai peninsula. Social divisiveness and community cohesiveness were each affected by the presence of the oil industry in affected communities.

Component Factors

- C oil industry employees among community members
- C community is a site for oil company businesses, but most oil business employees are non-residents of the community
- C oil businesses and employees reside in the community
- C presence of other well-developed economic and community sectors

2.3 ECONOMIC CHARACTERISTICS

The economic institutions and processes of Alaskan coastal communities are highly dependent on the natural resources damaged by the oil spill. Furthermore, the privatization of the cleanup also resulted in effects on local economies that in part mitigated some of economic effects of resource damages, but also had other consequences for impacted communities. Consequently, it is essential to consider the economic characteristics and processes of these communities in our factor-by-factor analysis. The specific components we will include in this analysis are enumerated below.

Component Factors

- C natural resource dependency: the more communities are dependent on natural resources for their economic structure, the more likely they are to have economic effects related to the EVOS event.
- C economic sectors and economic diversification: the less economically diverse a community is, the more likely that it would be affected/disrupted by spill event activities (spill itself, cleanup, and/or litigation). This is a corollary to the above factor, but its importance is that it points to the differences in effects related to the degree of economic diversity among communities effected by the EVOS event.
- C fishing sector diversity: communities such as Cordova, with less diversity in the fishing industry than communities such as Kodiak, were affected more by the EVOS event. Each of these communities is dependent on fishing, but there are more sectors (vessel types, processors, species harvested and processed) within the Kodiak industry than in Cordova. This is a factor that applies across the impacted communities.
- C subsistence participation: within Alaskan rural communities subsistence is an important economic as well as a cultural factor. For this reason, even though it is an important component of rural Alaskan economies, it is treated separately below.

- C cleanup participation: the cleanup provided a source of income to affected communities that had far reaching economic and social effects.
- C Exxon Valdez Trustee Council project participation (as paid employee or consultant)
- C employment/unemployment: Pre-event unemployment levels may have some relation to rates of cleanup participation and subsequent effects. Cleanup participation may have fostered or exacerbated labor supply problems for more “stable” community economic sectors. Length of employment (during any year) may be useful as a measure of seasonality of wage or other employment.
- C sources and distribution of income and mean income per capita are social factors that may well differentiate communities experiencing different effects from the EVOS event.
- C restoration fund investments in local resources (land/habitat purchase/easement, infrastructure development)

2.4 CULTURE

Culture is the system of beliefs, values, and worldviews that communities use to interpret and assign meaning to objects, events, relationships, and social conditions. Culture and its elements such as beliefs and values and cultural knowledge are not uniformly distributed within a society. When a novel event occurs individuals or groups may differentially interpret, assign meanings, and value what occurs as a consequence of that event. The extent of cultural homogeneity and heterogeneity can have consequences for how an event is understood within a community and for the impacts experienced. Furthermore, an “organizational culture” or “governmental culture” may perceive an event according to values, beliefs, and knowledge that are significantly different than those of a “community culture.” Such differences can be significantly magnified when there are non-Western cultures involved such as occurred with Native cultures in the EVOS event. Culture is thus an essential factor to consider for evaluating the impacts of the EVOS event because it frames how the event is understood, evaluated, and how impacted were themselves defined and experienced.

Cultural values and beliefs: communities assign importance to, and priorities among, ways of living, beliefs, and objects that we can term “cultural values.” Values are embedded within larger cultural meaning systems that allow us to interpret, for example, why the oiling of an archaeological site has a different impact on Native than non-Native communities.

Component Factors

- C homogeneity/heterogeneity of values among event participants
 - C differences in “organizational” and “community” values
 - C values and meaning about the significance and use of natural resources
 - C valuations of damaged natural and community resources

Risk perception: individuals and groups assess the type and degree of risk associated with exposure to an event and its effects on their lives. This is an important cultural factor for consideration of the overall effects of the EVOS event. Here risk perception includes the idea of what constitutes acceptable risk, signs and signals of threat, and the degree and kinds of threat posed by an event. Risk perceptions can vary between communities, between community sectors and individuals, and between communities and external organizations and groups. These perceptions may be partly influenced by conditions such as the presence of vulnerable individuals in a family or community, or the economic base of the community or

sector. Such perceptions of risk and threat are central to technological disasters in general and they have specific applicability to the EVOS event where individuals and sometimes entire communities perceived the risks and threats posed by the spill very different than the spiller and government institutions.

Component Factors

- C signs and signals of threat
- C assessment of risk types (e.g., economic, health risk, community's future)
- C assessment of potential damages (e.g., degree, long/short term)
- C assessments of recovery potential
- C perceptions of damaged "home"

Natural resource orientation: within and across communities and between communities and the spiller, there were diverse orientations to the value and use of natural resources. The classic difference is among those who value natural resources for their economic importance and those who value such resources for their lifestyle or spiritual significance. These are not always necessarily in conflict, but these differences in how people think about natural resources plays a part in the assessments of damages and the meaning of "recovery."

Component Factors

- C kind of natural resource orientation, including enjoyment, sense of responsibility for the environment, use for hunting and fishing, other sports
- C frequency and traditional nature of use/enjoyment of natural resources and settings
- C environmental/oil orientation: the orientation to environmental activism and especially to oil industry issues is a factor that affected how some communities responded and their participation in litigation and other actions during and after the spill

Sense of place and community: these concepts integrate the values, orientations, and activities of people who live in a "place" such as a "village" or "town." Sense of place extends an understanding of a "village" from a sociopolitical entity in a particular geographical place to one which addresses how activity, values, and space integrate to something larger. This "sense of place and community" is about the meanings people attribute to their homes and its environment; and it is about what is preferred, desired, and expected in how a home and its surrounding landscapes should look and be used. This is a corollary of values and natural resource orientations that integrates and extends both of those concepts for our analysis of which aspects of culture affected how communities were impacted by the EVOS event.

Component Factors

- C ancestral associations with community and locale
- C historical/religious interest in locale
- C value of community as "home"
- C existence of "special" places
- C integration of lifestyle and place
- C attachment to place

2.5 SOCIAL HEALTH

The ability of a community to respond to a crisis and maintain its "social equilibrium" is a working definition of social health. When communities cannot respond to crises there may be indicators such as

increased crime and other psychosocial conditions (e.g., substance and alcohol abuse) and the breakdown of social support. Some of these social health factors can compound or extend the impacts from other factors, and can be analyzed both as social indicators and as factors that contribute to the long-term health of a community.

Component Factors

C social support resources: these resources can be formal (i.e., clinics, hospitals, counseling services) or informal (voluntary associations, friendship networks) and affect the ability of communities to respond to crises.

C substance and alcohol use: these are common indicators of the social health of communities. While these are most obviously social effects, it is also possible that increased reliance on these substances in times of stress or economic boom may have been a factor contributing to other social effects such as crime and domestic violence.

C domestic violence/disturbance: these social factors may increase in response to disaster events; they may compound other social effects (such as the strain on health services) and may extend the duration of particular impacts (especially those related to social health) through their influences on the lives of children.

C crime: increases or decreases in crime can be an indicator of changes in the social health of communities and can itself be a source of additional impacts .

C mental health: as with crime, this can also be an indicator of the overall social health of a community, and may also be a social factor itself.

2.6 SUBSISTENCE

“Subsistence” encompasses far more than the individual behavioral patterns of harvesting, processing, distributing, and consuming/using natural resources for personal subsistence. Rather, these activities constitute a community (and more loosely regional) pattern of activities potentially interconnecting every household in any given community, and a significant number between communities. Shared kinship relationships within a land-oriented way of life are the most common idioms and ideology of subsistence. Individual and community social factors related to subsistence are listed below.

Component Factors

C number and percentage of community households using subsistence resources

C number and percentage of community households harvesting subsistence resources

C number and percentage of community households sharing subsistence resources

C number of different subsistence resources used, harvested, and shared

C frequency of use of subsistence resources

C per capita subsistence harvest

C access (method) to subsistence resources

C integration of subsistence with commercial activities (especially fishing)

Access to Resources

- C restrictions on access to subsistence resources, for reasons of human health or the health of the species
- C availability of subsistence resources: perceived increase or decrease in the availability of subsistence resources

Subsistence Hunting

- C frequency of subsistence hunting
- C number of species/kinds of resources hunted
- C success of hunting: perceived increase or decrease in the success of subsistence hunting
- C anticipation of future reliance on hunting
- C distance covered, time and effort expended to hunt (relates to perceived species availability)

Resource Use

- C sharing and maintaining social ties
- C primary food source, secondary food source
- C enculturation about community values, cultural history, knowledge of local geography, social roles, hunting methods, methods of subsistence food preparation, values and beliefs about the natural environment

Subsistence social factors combine with other, more general social factors, to produce greater or lesser effects upon individual and community subsistence activities. Examples of such “other social factors” are proximity to the spill event, demographic and ethnic characteristics of the community, and economic characteristics.

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