

Social Constraints and Solutions for the Development of the Nation's Offshore Aquaculture Industry

Key Points

The growing worldwide demand for seafood exceeds the productive capacity of the world's capture fisheries. Offshore aquaculture has the potential to provide a reliable source of seafood, a healthy food source, to the world while also reducing fishing pressure on wild fish populations and the demand on land and fresh water resources. The development of the nation's offshore aquaculture industry can reduce dependence on imports, increase national seafood self-sufficiency, supplement the livelihood of commercial fishermen, reinvigorate working waterfronts, support seafood producing and distributing infrastructure, and create new jobs.

Siting aquaculture operations in offshore waters is a way to reduce many of the challenges that have been associated with marine aquaculture in coastal waters. These challenges include: space use conflicts; aesthetic concerns expressed by contiguous landowners and residents; and environmental problems associated with human land activities. Offshore waters also hold promise for increased fish growth and improved health while being more suitable for ocean species that also offer higher market values.

The US potential for offshore aquaculture is vast. The United State's Exclusive Economic Zone (EEZ), over which the nation has exclusive rights of resource extraction, is the second most expansive in the world. Assessed in terms of the important siting criteria of cost effectiveness, current speed, and depth, US EEZ ranks 1st, 3rd, and 4th in size. Integrating the three factors of depth, current speed and cost effectiveness, there is approximately 7,500 square kilometers of suitable area within US EEZ for marine aquaculture. Additionally, the EEZ encompasses a wide range of ocean ecosystems, including high Arctic, subarctic, temperate, subtropical, and tropical.

Analysis of interview data and literature suggest that there are considerable similarities in understanding of the primary constraints and challenges to the development of offshore aquaculture across all categories of respondents and in all three regions of study. The development of offshore aquaculture has been hindered by:

- Lack of a sufficient policy framework for enabling and guiding an offshore industry. Applicants report facing: uncertainty regarding permit requirements and permit lengths; difficulty negotiating the permit process; unreasonable or potentially contradictory conditions established by agencies; and/or unclear timeline for permitting.
- Lack of sufficient and consistent funding to support all phases of industry development. Researchers report inadequate funds for offshore aquaculture research and development – funding is particularly needed to support the development of informational tools that can mitigate potentially negative socio-economic and environmental impacts and thus support the development of a consensus regarding the benefits of offshore aquaculture. Staff at agencies with regulatory authority over marine aquaculture report¹ the lack of funding and human resources needed to conduct interagency workshops necessary for establishing a streamlined regulatory processes. Industry representatives report high costs for preparing the information necessary for permit applications and difficulty accessing

investment capital, due to lack of clear regulatory framework and successful domestic examples of the offshore industry.

- Lack of understanding on part of key decision makers and the public regarding: (1) available mitigation measures to protect water quality, fishery resources, and marine mammals; (2) scale of aquaculture operations and likelihood of marine spatial conflict; and (3) potential benefits of advancing offshore aquaculture. Industry respondents and aquaculture researchers have expressed concerns regarding longstanding practices of powerful and well funded anti-aquaculture conservation organizations to present outdated and negative images of marine aquaculture. Additionally, industry respondents have expressed concerns regarding the ability of anti-aquaculture organizations to stall a permitting process or exert pressure for unnecessary, and costly, permit and monitoring requirements.

Notwithstanding the above challenges, the advancement of the offshore industry is occurring through different regulatory approaches. The Gulf of Mexico Fishery Management Council is in final stages of rule making to permit the farming of select federally managed species in federal waters of the Gulf of Mexico. Aquaculture operations have recently been permitted for offshore waters of California, Massachusetts, and Hawaii; moreover, additional aquaculture operations are under review in California and Hawaii.

Many of the conditions under which offshore aquaculture will be developed continue to be debated. Primary points of debate include: permit duration; siting restrictions; permissible species; production capacity; and monitoring requirements. For the successful advancement of sustainable offshore aquaculture, conditions will have to balance economically feasibility and sustainability (for the industry); environmental protection; and impact to other marine users, amongst others.

Growing industry interest is providing agency staff with experience permitting a kind of operation and activity they might not be familiar, and an opportunity to communicate with staff in other agencies. NOAA's Office of Aquaculture have supported applicants through: providing legal review of permit requirements (through the National Sea Grant Law Center); offering consultation on permit process; identifying research needs; and facilitating intra-and inter-agency workshops (to assess the potential risk of aquaculture gear for marine mammal entanglement and established water quality and benthic monitoring requirements for offshore environment).

Researchers, from the public and private sector, have prepared a series of white papers (on alternative feeds, water quality impacts, and marine mammal entanglement) and developed GIS and modeling tools (to depict spatial conflicts and to assess water column and benthic impacts of farms; genetic risks associated with escaped fish; and risk of disease transmission to wild fish).

A number of non-governmental/conservation organizations are re-assessing previous positions on aquaculture and working toward the advancement of sustainable marine aquaculture. These organizations are playing an important role in bringing together diverse stakeholders to discuss the import of new technological advancements and to create aquaculture standards to guide the industry and inform consumers of industry practices. Additionally, they are reaching out to

educate the public by developing visually compelling, easily understandable, concise, and accurate messaging regarding marine aquaculture.

The continued advancement of the offshore industry will require ongoing efforts in:

- establishing intra and interagency working groups to arrive at a uniform set of permitting and monitoring requirements and a single application form that fulfills the informational needs of all agencies;
- preparing programmatic reviews/impact studies that reduce the cost and time for applicants to undergo a review process and allow the review of proposed operations to be focused on site specific concerns;
- promoting commercial scale demonstration projects that bring together private and public sector funding and expertise and provide agencies and industry the opportunity to create a shared vision of permitting and monitoring requirements for offshore aquaculture operations;
- increasing funding from government agencies, private sector investors, and non-profit sector for aquaculture development;
- developing GIS capabilities and other modeling tools for communication purposes and to support stakeholders' discussion of siting options for aquaculture operations;
- identifying and informing key decision makers at all levels of government of: the need and benefits of developing the nation's aquaculture industry; new scientific advancements within the industry; and modeling tools for siting operations to mitigate social, economic, and ecological impacts;
- translating scientific information for public use and identifying channels for effective distribution.

The above efforts will require active engagement of regulatory agencies, aquaculture and seafood industry, research sector, and non-government organizations.