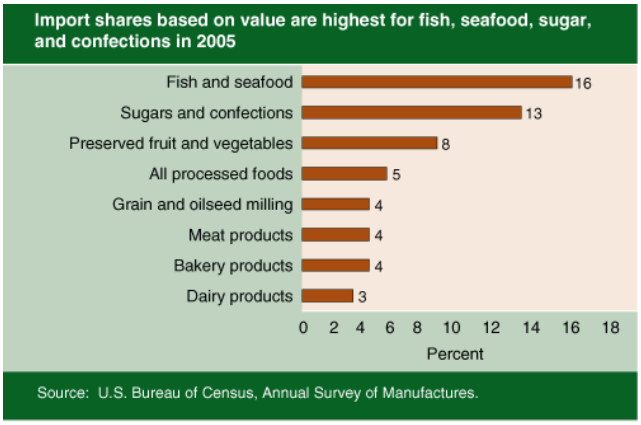
Is Offshore Finfish Aquaculture in the Southern California Bight an Idea Whose Time Has Come?

Background

On September 19-20, 2008 the Aquarium of the Pacific's Marine Conservation Research Institute convened its Aquatic Forum to explore and assess the potential for development of a sustainable offshore[1] finfish aquaculture industry in the Southern California Bight. This is a brief summary of that Forum. The full report can be found at www.aquariumofpacific.org under the heading *Conservation*.

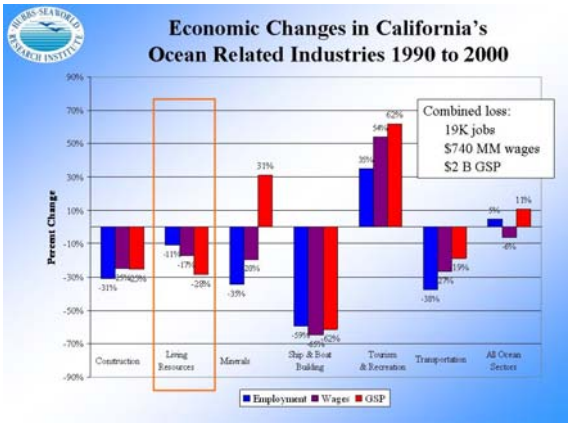
While the U.S. imports only 16% of its total food needs, it imports 84% of its total seafood, or about 4.8 billion pounds of the 5.8 billion pounds consumed each year. About half of the imported seafood is farmed. China is the U.S.'s largest source of imported seafood and there are concerns about seafood safety. Four hundred shipments from China were rejected recently by the U.S. Food and Drug Administration.



The demand for a sustainable, uninterrupted supply of safe seafood in Southern California is clear. The per capita consumption of seafood in this area is approximately twice the national average, and the demand continues to grow as population increases and people become more aware of the health benefits of eating seafood. As with the U.S. as a whole, most of the current supply to Southern California, about 80%, is imported and most of that comes from Asia, contributing to the carbon footprint and to food miles. Both of these are counter to the trend in favor of locally grown foods and to California's environmental ethic.

Aquaculture has the potential to create jobs in coastal communities along the California coast, to help preserve what remains of the working waterfront, and to help rebuild wild stocks important to California's commercial and recreational marine fisheries.

California has the largest ocean economy of any state in the nation. It is dominated by the travel/tourism and trade/transportation sectors. In 2000, the last year for which the analysis has been made, marine-related travel/tourism accounted for 59% of California's Gross Domestic Product (GDP), and marine trade/transportation accounted for 33% of the state's GDP. The total value of fishing, fish hatcheries, and aquaculture accounted for only about 2% of the GDP[2]. Given the state's extensive coastline and diverse coastal ecosystems coupled with the demand for seafood, the question that must be addressed is whether or not there is an opportunity to enhance the values of California's living resources sector. This forum focused on the potential of developing an offshore finfish aquaculture industry in the Southern California Bight.



1. Offshore is defined to include both state and federal EEZ waters.
2. This figure excludes recreational fisheries which are included under "Marine-related travel and tourism" and not under "Living Resources."

Forum Strategy

The Forum was designed to test the following hypothesis:

Southern California could support an offshore finfish aquaculture industry that could become a $1 billion/year industry with only a very small percentage of State waters or Federal waters (the EEZ) in the Southern California Bight dedicated to this purpose. A properly constructed and managed industry would provide a safe, secure, stable supply of healthful seafood to the region, would relieve pressure on wild fish stocks, and would help conserve the remaining working waterfront—all without unacceptable adverse impacts on the environment and other uses of the ocean.

Since a scientific hypothesis can never be proven, only disproven, the strategy used was to build the strongest case in support of the hypothesis and then to attack it. The attack had two goals. First, to determine if the hypothesis is tenable and robust, and second to identify assumptions and issues where it is most vulnerable so these could become the foci for additional research and analysis. This approach was chosen by the organizers of the forum because it reflects our philosophy that: we can not meet the growing demand for seafood without aquaculture; aquaculture can and must be done in sustainable ways; many present and past marine aquaculture operations have not been sustainable in other parts of the world; and California should set the standards of performance—environmentally and economically—for the nation and globally.

Participants

The Forum was not open to the public: participants were all selected, most being experts in disciplines that can be directly applied to aquaculture. Selection was dictated by the strategic and philosophical approach taken for the forum. They included the individuals responsible for aquaculture policy at the federal level and at the State of California level; academic aquaculture scholars; successful aquaculture entrepreneurs and practitioners; scientists and engineers who have developed a sophisticated model for siting offshore aquaculture farms to minimize any adverse environmental impacts; and a venture capitalist interested in the economic potential of aquaculture. Also included were representatives of the environmental NGO community whose organizations have challenged some present and past aquaculture practices that have caused well-documented environmental damage in some parts of the world. And, the forum included a leader of the Southern California commercial fisheries industry.

Findings

Although no formal votes were taken, at certain times throughout the forum, straw polls were taken to assess the level of support for certain conclusions and recommendations. All the findings that follow had very strong support of the participants.

Conditions in the Southern California Bight

- The oceanographic conditions in the Southern California Bight make it one of the most favorable coastal areas of the entire nation for development of a sustainable offshore aquaculture industry. These favorable conditions include: good circulation, relatively deep water close to shore, and few severe storms.
- A critical mass of the necessary shore-based fisheries support infrastructure still exists.
- There is a high level of scientific and technical expertise in fisheries and aquaculture within the region.

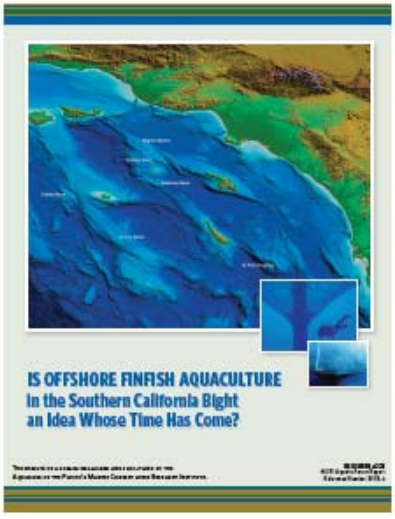


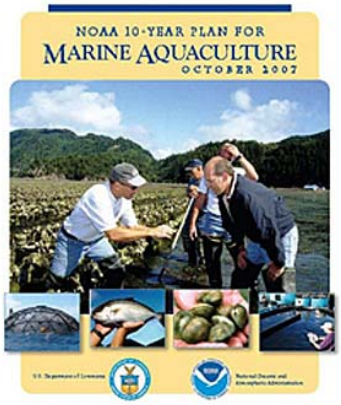
Image of Southern California Bight sea floor: Permission of Dr. Chris Goldfinger & Jason Chaytor of Oregon State Universitie's College of Oceanic and Atmospheric Sciences
Image of underwater open ocean aquaculture cage spar and diver: Permission of Kona Blue Fish farms
Divers cleaning submersed cage: Courtesy of National Oceanic and Atmospheric Administration (NOAA)

Other Favorable Conditions

- The "California ocean ethic" could be very advantageous to developing a sustainable offshore aquaculture industry in the Southern California Bight that would complement the "California-Grown" label for agricultural products, and that could serve as a model for the rest of the state, the nation, and the world. California legislation officially supports development of sustainable ocean aquaculture to augment food supplies, expand employment, promote economic activity, increase native fish stocks, enhance commercial and recreational fishing, and protect and better use the land and water resources of the state (Public Resources Code Section 826; Public Resources Code Section 30230; The California Coastal Act of 1976, Section 302225; The Sustainable Oceans Act, SB 201).
- The Southern California Bight is within a 36 hour truck delivery of products to a market of approximately 50 million people.

Impediments and Challenges to Developing Offshore Aquaculture in the Southern California Bight

- Perhaps the two biggest impediments to development of an offshore aquaculture industry anywhere in California are
  - Lack of a strong constituency, either from industry or the public, and
  - The existing regulatory framework that involves both state and federal agencies discourages investment in offshore aquaculture development because of its complexity, uncertainty, and unpredictability. In California, the Sustainable Oceans Act (SB201) provides a comprehensive framework for the state to manage marine finfish aquaculture in state waters in an environmentally sustainable manner. In the absence of a coordinated regulatory framework for federal waters, and assuming there are no conflicts with federal legislation and regulations, California could argue that the state would have authority to register and regulate an offshore facility in federal waters with existing legislation, policies and regulations, recognizing that other federal laws also would apply.
- Before venture capitalists and aquaculture entrepreneurs will make significant investments in offshore aquaculture in California waters, there will need to be some assurances that if standards and criteria are met, they can have confidence that their leases can be extended in both time and space. At present, this is not the case.
- A thoughtful and systematic analysis should be carried out to explore and evaluate how a few demonstration farms might evolve into a full-fledged industry—what that industry might look like when mature including: the number and location of farms, how it could be integrated with other uses of the coastal ocean to minimize conflicts, environmental and economic impacts, etc.
- Competition—real and perceived—needs to be dealt with. Competition with wild fisheries can be minimized by having aquaculture in Southern California concentrate on those species for which there is no viable commercial fishery or where availability is limited seasonally. Competition for ocean space is more challenging in the Southern California Bight which is a prototypical example of an urban ocean with multiple and conflicting uses.
- Movement of farms farther offshore and into deeper water would reduce conflicts with surface activities.
- Space-based allocation of uses could decrease competition for space by assigning societally important uses to appropriate locations. A viable and sustainable offshore aquaculture industry would require less than 1% of state waters within the Southern California Bight and less than 0.1% of the contiguous EEZ waters.
- Cage technologies already exist to support an offshore aquaculture industry in the Southern California Bight.



Recommendations

- There was unanimous agreement that it is time to design and carry out one or more demonstration projects in the Southern California Bight to test the concept of offshore aquaculture using the following approach:
  - The site(s) should be selected using the best tools available, such as the AquaModel.
  - High environmental performance standards should be set and the operation should be monitored rigorously for compliance with those standards.
  - The scale of the projects should be large enough that concerns such as those associated with water quality and benthic impacts can be evaluated at appropriate confidence levels.
  - The species selected should be native to the region, or those that have established self-reproducing populations. Examples include: white sea bass, California yellowtail, California halibut, and striped bass.
  - The project should be based on the precautionary principle and adaptive management. The entrepreneurs should be given the opportunity to learn from their operations and to incorporate those lessons into revised business practices consistent with achieving high environmental standards.
- If offshore aquaculture is to become a successful industry in Southern California, it needs a constituency. This will come only through a sustained program of public education and outreach that is accurate and balanced and based on the best scientific data and information. On-going conversations are needed among the various constituencies to explore issues—real and perceived—and to elevate these conversations above the level of 'bashing'. The conversation needs to encompass what the supplying of people with protein from the sea will be in the future, the mixture of wild-caught and farm-grown. This conversation would benefit by being embedded in a larger discussion of the total food supply for the future.

Conclusions

The potential for development of a sustainable offshore aquaculture industry in the Southern California Bight is high based on existing data, information, and knowledge. Nothing said during this forum would violate the original hypothesis:

Southern California could support an offshore finfish aquaculture industry that could become a $1 billion/year industry with only a very small percentage of State waters or Federal waters (the EEZ) in the Southern California Bight dedicated to this purpose. A properly constructed and managed industry would provide a safe, secure, stable supply of healthful seafood to the region, would relieve pressure on wild fish stocks, and would help conserve the remaining working waterfront—all without unacceptable adverse impacts on the environment and other uses of the ocean.

The economic value may be overly optimistic and a number of areas continue to be of concern, but the very strong consensus was that perceptions will be changed only through successful demonstration projects of appropriate scale, managed adaptively, and with certain safeguards built-in.

Speakers:
Devin Bartley
William Eichbaum
John Forster
Dennis Hedgecock
Don Kent
Dale Kiefer
Sam King
Jack Rensel
Michael Rubino
Jerry Schubel

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William Eichbaum
George Leonard
Neil Sims
Robert Stickney
Jerry Schubel (Mod)

Panel 2:
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Drew Bohan
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The Aquarium of the Pacific's Aquatic Forum is dedicated to exploring important, complex, and often contentious issues with environmental, social, and economic dimensions. The Aquatic Forum is an activity of the Marine Conservation Research Institute (MCRI).

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