



**Summary of NOAA's Aquaculture Listening Session
Seattle Aquarium
Seattle, Washington
April 22, 2010**

Chair: Eric Schwaab, NOAA's Assistant Administrator for Fisheries

Scientific Expert: Dr. Chris Langdon, Oregon State University

Attendees: 56 (list is attached to this document)

Public Comments: 27

Held on April 22, 2010, this listening session was the third in a series of public listening sessions conducted by the National Oceanic and Atmospheric Administration (NOAA).

At 6:05 p.m., Eric Schwaab, NOAA's Assistant Administrator for Fisheries, opened the meeting and thanked participants for attending and providing their input on a marine aquaculture policy for NOAA. The chairman's opening remarks highlighted NOAA's interest in developing a new policy for marine aquaculture that:

- Addresses all forms of aquaculture (seafood production, enhancement, and restoration).
- Supports development of a robust U.S. marine aquaculture industry that is environmentally and economically sustainable, creates new jobs and business opportunities, and enhances U.S. food security.
- Promotes protection of ocean resources and marine ecosystems.
- Addresses the fisheries management issues and opportunities posed by aquaculture.

He noted that NOAA is currently seeking public input to help shape the scope and objectives of a draft policy. Mr. Schwaab also noted that the current NOAA definition of aquaculture covers all production of finfish, shellfish, and other marine organisms, excluding marine mammals, for:

1. Human consumption and other commercial uses;
2. Wild stock replenishment;
3. Rebuilding populations of threatened or endangered species, and
4. Restoration of marine habitat.

The chairman also noted that, with respect to the process for developing the policy:

- Once the public comment period is over, NOAA will take the input and develop a draft policy that will be released for additional review and public comment.
- Once NOAA has that input, the agency will finalize, adopt, and begin to implement the new policy.

The chairman then directed participants to the meeting hand-out which outlined the rules governing the session and seven questions that are intended to guide discussion at the public listening sessions and the comments submitted in writing. Those questions are:

1. What opportunities exist for developing sustainable marine aquaculture nationwide? What are the major impediments?
2. What are the most important environmental considerations and how can these be addressed?
3. Which social and economic consequences or outcomes will be the most important in the next 5 years or in the next 20 years?
4. How can NOAA best support essential research and innovation? What should be the goals of NOAA-funded research related to aquaculture?
5. How can NOAA best communicate with the industry and public on aquaculture issues? What are the opportunities for partnerships?
6. What role should NOAA play with respect to aquaculture issues and initiatives at the international level?
7. What other considerations need to be addressed in NOAA's aquaculture policy?

The chairman also outlined additional ways interested stakeholders could share their suggestions with NOAA through an internet-ready kiosk for online comments, a national teleconference on May 6th, or via the internet at any time 24 hours a day. Details about these options are posted on the NOAA Aquaculture Program website at: <http://aquaculture.noaa.gov>.

Mr. Schwaab then introduced Dr. Chris Langdon of Oregon State University to give an overview of U.S. aquaculture within a global context and his assessment of the challenges and opportunities for U.S. marine aquaculture. Dr. Langdon is Professor of Fisheries in the Department of Fisheries and Wildlife and the Coastal Oregon Marine Experiment Station, Oregon State University. He earned his Ph.D. in 1980 from the University of Wales, U.K., he holds an M.S. in Marine Science from the University of Wales, and has a B.S. in Ecological Sciences from the University of Edinburgh, U.K.

The chairman noted that Dr. Langdon's research interests include aquaculture of shellfish and marine tropical fish larvae, polyculture, microencapsulation techniques, aquaculture nutrition, molluscan genetics, and marine ecology. His recent research has focused on: genetic selection of Pacific oysters, development of microparticulate diets for marine bivalves and fish larvae, development of polyculture systems that include macroalgae and abalone, and the role of burrowing mud shrimp in the trophic dynamics of West Coast estuaries.

When [Dr. Langdon's presentation](#) was over, Mr. Schwaab then opened the meeting for public comments. Twenty-seven people signed up to give remarks. They were called on in random order. Please see the list at the end of this document for the names and affiliations of the attendees including the people who gave comments.

The following is a condensed version of the public comments given at the listening session.

Science, Research and Technology and Innovation

- NOAA should fund more research of pilot projects.
- NOAA should continue its sustainable alternative feeds initiative, including replacing fish oil/meal with plant-based feeds, which are good for both wild stocks and American farmers.
- More research is needed on sustainable marine aquaculture, including studies of multi-tropic aquaculture; nutrient trading of shellfish; shellfish restoration; the impacts of climate change and ocean acidification on aquaculture; and the recapture of nutrients lost in finfish systems to the ecosystem.
- NOAA has spent millions on research, but most technological innovation has been exported; the new policy should support innovation in the United States.
- Focus on restoration aquaculture because species recovery depends primarily on aquaculture hatchery operations – e.g., native oyster restoration and captive breeding program for abalone.
- There is already an extensive amount of scientific literature currently published. NOAA should inventory all the aquaculture research that is available, develop a database of science literature for aquaculture, and make this information available to the public.
- NOAA should provide grants for innovative aquaculture projects; encourage innovation in the industry; resolve some of the regulatory issues and understanding of environmental factors; and fund studies to address environmental issues raised.
- NOAA should recognize alternatives to open ocean aquaculture such as closed containment systems.
- NOAA research should be industry-driven and focus on disease prevention and increasing production yield.

Economic and Social Issues

- The United States needs to learn how to grow our own food. Human population is going up, the United States needs access to protein, and aquaculture is the answer. Saying “no” to U.S. marine aquaculture increases reliance on foreign sources of seafood.
- The United States is now just a seafood consumer. The country needs to culture seafood (shellfish and finfish) at home in order to keep investment dollars in the United States, provide jobs and economic opportunity, regain American core values of self sufficiency, and encourage sustainable aquaculture.
- Shellfish are a luxury item and should not be grown in the United States because the general public cannot afford to buy shellfish.
- Aquaculture is important to maintain sustainable communities. Shellfishing has been around hundreds of years. Sustainability includes local supplies of seafood.
- Puget Sound needs to be “diggable, fishable, swimmable” and that includes seafood production, which gives the coastal community a tangible connection to health of waters.
- Cultivation is the answer to conservation in the oceans and in our economy.

- NOAA has an obligation to take the lead in integrating aquaculture into our landscape. If we get it right, it will be lasting and sustainable. If wrong, there will be no benefits. This is part of the debate about our ocean and seascapes and the roles of shellfish aquaculture and marine protected areas. We need to take an ecosystem approach.
- Steelhead farms that employ tribal members have been located successfully in areas with 91% unemployment rates. Aquaculture companies should try to increase tribal employment.
- Markets now get flooded with cheap imported farmed salmon and that impacts the price of wild salmon and coastal communities.
- American farmers, who produce components of fish feeds, want to see an economically viable aquaculture industry and a common sense regulatory environment.

Environmental Issues

- Shellfishing can be sustainable, is not environmentally harmful, and provides steady income to working class families. There are mostly positive benthic impacts from shellfish aquaculture.
- NOAA should ban nets and tubes for geoducks, work to limit site density, and not encourage the use of plastics (PVC pipe) in shellfish operations. There are public concerns precluding other indigenous species from tidelands; putting areas off limits to fishing; impacts of harvest methods, the lack of information about the impacts of harvesting, and the amount of plastics washing up from geoduck operations on the beach.
- Geoduck farmers are responsible stewards of beaches and local environment and provide jobs that include medical and dental benefits for employees.
- NOAA should adopt a precautionary approach and have the protection of wild fish as a priority. There is also a need to protect water quality and ensure that siting considerations are an important component of decisions about aquaculture.
- There is already a lot of science on the effects of aquaculture generated in the United States and internationally. There is also a lot of misinformation on both sides of the aquaculture debate. There are impacts, but they need to be put in context. NOAA should inventory and qualify this research.
- The Puget Sound should be a conservancy estuary and not a production estuary.
- The regulatory scrutiny of the shellfish industry is extensive, the shellfish industry has been addressing environmental concerns, and shellfish create net environmental benefits in the region.
- Concerns about finfish aquaculture include escapes, parasites, genetic impacts on wild populations, and the input of chemicals into the marine environment. There is public concern about salmon net pens and sediment impact zones for net pens. All fish pens should be required to have permits (including tribal pens).
- Pollution impacts and pesticides from upland finfish rearing facilities are not well quantified and other inputs of pollutants and pesticides are not regulated.
- Neither recreational nor commercial fishing is benign. Everything has an impact but, if we do it well, then we can lessen those impacts.
- There cannot be a comprehensive salmon recovery plan when shellfish industry removes essential fish habitat (EFH).
- Best performance standards for major aquaculture production species need to be defined.

- There is a perceived lack of science-based standards for siting of fish farms but that is not the case.
- Salmon farming has been detrimental to the environment.
- Currently there are well developed sustainable aquaculture operations in the United States using strict performance standards. Finfish farms in Washington State and Maine, for example, have been operating under tight strict regulatory requirements.
- Aquaculture is ocean conservation at its best because you free up the wild stocks when you do ocean farming.

Institutional/Regulatory Concerns

- NOAA's policy should recognize that U.S. marine aquaculture is in the public interest.
- There are many regulatory constraints for aquaculture and the regulatory scrutiny is extensive. Farmers require multiple federal permits and reviews in addition to shoreline permits and authorizations from the Washington State departments of Health and Fish and Wildlife. Some mussel raft farmers have been in the process of obtaining permits for over 14 years. Small farmers need help to streamline shellfish permitting process. As a result of regulatory streamlining in Alaska, which has a single clearinghouse, the number of shellfish farms expanded from zero to 10,000 acres of shellfish farms and this growth provided jobs in poor rural Alaskan communities.
- The major impediment to aquaculture is siting. The environmental considerations have all been addressed but nothing has been 100% addressed because it is always changing.
- Shellfish companies in Washington State are going to other countries to expand because they can not obtain permit to operate in the United States.
- Develop/fund aquaculture zones pre-approved for net pen or shellfish culture.
- The 1998 NOAA Aquaculture Policy is fine. NOAA should just issue some guiding principles that incorporate what we have.
- National legislation should include environmental, socio-economic, and public health elements.
- Maximize use of existing regulatory systems. For example, the Clean Water Act addresses aquaculture through National Pollutant Discharge Elimination System (NPDES) permits; no need to duplicate what already exists.
- NOAA should recognize that fish farming is not fishing. Marine aquaculture should be exempt from the *Magnuson-Stevens Fishery Conservation and Management Act*. We must classify aquaculture as agriculture; it is not fishing and does not even closely resemble fishing.
- The near-term opportunity for coastal aquaculture in the Pacific Northwest is non-existent because of regulatory inaction.
- The Pacific Northwest needs a NOAA regional person to help coordinate agencies and regulations, help communicate with industry, and coordinate scientific research.
- Recognize that user conflict issues and unpredictable regulatory environment are the main impediments to aquaculture. This is why many U.S. companies move to foreign waters, taking jobs, technology, and tax revenue with them.

- There is a lack of communication among regulators. The new policy should include coordination with all agencies and it should focus on all marine aquaculture. NOAA should be a clearing house for federal coordination.
- Recognize an opportunity with reauthorization of Coastal Zone Management Act to allow states to plan for aquaculture. People need planning and zoning tools.
- The keys to attract investment are long term permits for industry and certainty.
- NOAA and state agencies need to set up pre-approved areas for aquaculture.
- US seafood companies are looking for opportunities to grow seafood in the US. But regulatory constraints and costs are a challenge.

Aquaculture in Federal Waters

- Opportunities exist for aquaculture in U.S. federal waters. The United States has an extensive Exclusive Economic Zone available.
- NOAA should not pursue open ocean finfish aquaculture in open nets.
- Offshore aquaculture is a major challenge. There are no models of sustainability for tuna farming, salmon or other species. Open ocean aquaculture doesn't mitigate pollution or take into account the waste. There is an increased need for food globally, but we should not do it at the cost of oceans. We need to figure out the sustainability issue before we move to federal waters.
- Promote fish farming that does not pollute or take from wild stocks to produce fish.
- Open ocean finfish aquaculture should proceed only when peer review literature shows no negative impacts on coastal fishing communities.
- The federal government should move forward without delay with a policy for aquaculture in federal waters. The policy should include common sense provisions, long term permits, and allow for effective use of plant-based feeds.

Market Development

- Support environmentally sustainable aquaculture in Washington state waters.
- Allow use of feed supplies from managed fisheries.
- Lease geoduck sites from private and environmentally aware landowners. Working the beach contributes to local jobs and affords people with the means to live and afford health care.
- Geoduck is a luxury item that is shipped overseas, not a part of the typical U.S. seafood diet.
- Consequence of the lack of U.S. aquaculture is that more and more seafood is imported. This is unfortunate because importers are not held to the same food safety standards that U.S. producers are (i.e., water quality and post harvest treatment). The United States should hold importers to same standards as U.S. producers.
- Sustainable seafood is not just a nice goal but something that must be embraced. Grocery chains and non-government organizations are partnering to market environmentally sustainable seafood. NGOs have a responsible role to play here representing affected stakeholders; they should not just use scare tactics.

- The Puget Sound is ripe for aquaculture development and has lots of potential there to expand existing production of aquaculture.
- Aquaculture is important to soybean farmers. Soy is a safe and reliable alternative or supplement to fish meal.

International

- U.S. marine aquaculture development is immature. NOAA needs to provide leadership and look at countries that have done aquaculture sustainably within their respective regulatory structure and management regimes.
- The United States is a net importer of seafood and we have no idea what some other (exporting) countries are doing as far as regulation. Importing so much seafood outsources U.S. regulatory control to other countries.
- There are no food safety standards overseas so there is a lack of level playing field. The role of NOAA internationally should be to level the playing field between global and U.S. production.
- Bring together leaders in the field to erase misunderstandings.
- NOAA should focus on domestic aquaculture before going international but needs to compile international research.

Following the final comment, Mr. Schwaab thanked participants, NOAA Aquaculture Program staff, the Seattle Aquarium, encouraged participants to submit comments online and adjourned the listening session.

(see next page for list of attendees)

First Name	Last Name	Affiliation	Speaker
Mark	Albertson	Illinois Soybean Association	x
Brian	Allee	NOAA Fisheries	
Brian	Allen	Puget Sound Restoration Fund	
Peter	Becker	Pacific Aquaculture Council	x
John	Bielka	Pacific Seafood	x
Kevin	Bright	American Gold Seafoods	x
Carrie	Byron	Washington State Dept. of Ecology	
Tris	Carlson	Seattle Shellfish	
Cathy	Carlson	Seattle Shellfish	
Cara	Cruickshank	Oysters for Salmon	x
Joth	Davis	Taylor Shellfish Co.	x
David	DeForest	Windward	
Yvonne	Dereynier	NOAA Fisheries	
Bill	Dewey	Taylor Shellfish Co.	x
Peter	Downey	Discovery Bay Shellfish	x
Elizabeth	Dubovsky	Trout Unlimited	
Pete	Granger	Washington Sea Grant	
Dan	Guy	NOAA Fisheries	
Doris	Harsh	Washington Conservation Corps/Americorps	
Laura	Hendricks	Sierra Club	x
Steve	Hilton	American Gold Seafoods	x
Bobbi	Hudson	Pacific Shellfish Institute	
Ian	Jefferds	Penn Cove Shellfish	x
Karen	Kosecrolek	citizen	
Steve	Landino	NOAA Fisheries	
George	Leonard	The Ocean Conservancy	x
Kevin	Merritt	Socrata Inc.	
Chris	Metcalf	Socrata Inc.	
Hugh	Mitchell	Aqua Life Veterinary Services	x
Jamie	Money	University of Washington	
Anne	Mosness	Go Wild Campaign	x
Colin	Nash	NOAA Fisheries, retired	
Kathleen	Neely	NOAA Fisheries	
Pete	Nicklason	NOAA Fisheries	
Jim	Parsons	National Aquaculture Association	x
Betsy	Peabody	Puget Sound Restoration Fund	x
Corey	Peet	David Suzuki Foundation	x
Brian	Phipps	citizen	
Marco	Pinchet	Taylor Shellfish Co.	

First Name	Last Name	Affiliation	Speaker
Samuel	Plauche	Plauche & Stock LLP	x
Curt	Puddicombe	Coalition to Protect Puget Sound Habitat	x
Kristin	Rasmussen	Pacific Shellfish Institute	
Jack	Rensyl	Rensyl Associates Aquatic Services	x
Mike	Rust	NOAA Fisheries	
Janna	Sargent	Washington Conservation Corps	
Karl	Shearer	Aquaculture Protein Center, Norway	x
Susan	Skafroth	citizen	x
Peter	Stitzel	Montlake Mining Co.	x
Amanda	Stock	Plauche & Stock LLP	
Geoff	Tabor	Shellfish Industry	
Bill	Taylor	Taylor Shellfish Co.	x
Paula	Terrell	Alaska Marine Conservation Council	x
Heather	Trim	People for Puget Sound	x
Paula	Williams	Suquamish Tribe Fisheries	
Vicki	Wilson	Arcadia Point Seafood (grower)	x
Wendy	Ysusi	Antioch University - Seattle	
Scientific Expert			
Chris	Langdon	Oregon State University	
NOAA Staff			
Lynne	Barre	NOAA Fisheries	
Laurel	Bryant	NOAA Fisheries	
Susan	Bunsick	NOAA Aquaculture Program	
Brian	Fredieu	NOAA Aquaculture Program	
Ruth	Howell	NOAA Fisheries	
Kate	Naughten	NOAA Aquaculture Program	
Michael	Rubino	NOAA Aquaculture Program	
Eric	Schwaab	NOAA	
Janet	Sears	NOAA Fisheries	