



**Summary of NOAA's Aquaculture Listening Session  
U.S. Geological Survey Visitors Center  
Menlo Park, California  
April 29, 2010**

**Chair:** Dr. Christine Blackburn, Office of the Under Secretary, NOAA  
**Scientific Expert:** Dr. Chris Langdon, Oregon State University  
**Attendees:** 39  
**Public Comments:** 16

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Held on April 29, 2010, this listening session was the fifth in a series of public listening sessions conducted by the National Oceanic and Atmospheric Administration (NOAA).

At 2:10 p.m., Dr. Christine Blackburn, a senior policy advisor in NOAA's Office of the Under Secretary, opened the meeting and thanked participants for attending and providing their input on a marine aquaculture policy for NOAA. The chair'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 economically and environmentally 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.

She noted that NOAA is currently seeking public input to help shape the scope and objectives of a draft policy. Dr. Blackburn 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 chair also noted that, with respect to the process for developing the policy:

- NOAA is interested in being proactive in how aquaculture develops worldwide.
- 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.

Dr. Blackburn then directed participants to the meeting handout which outlined the rules governing the session and the seven questions that were 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 chair also outlined additional ways interested stakeholders could share their suggestions with NOAA through online comments and a national teleconference on May 6<sup>th</sup>. Details about these options are posted on the NOAA Aquaculture Program website at <http://aquaculture.noaa.gov>.

Dr. Blackburn 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.

Dr. Blackburn 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, Dr. Blackburn opened the meeting for public comment. Sixteen 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.

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

### **Science, Research and Technology and Innovation**

- It will be critical to synthesize the large body of scientific literature to craft a vision for U.S. aquaculture.
- Develop an ecosystem-based agenda for aquaculture that focuses on innovative research.
- Focus aquaculture research on advanced land-based technology, multitrophic aquaculture, and low impact species.
- Maintain funding in mitigation hatcheries to offset losses in the wild. Ensure a strong genetic element for hatcheries so that those fish and shellfish are compatible with wild stocks.
- Fund aquaculture research for strong nets (which would reduce likelihood of escapes), better water flow, and efficient dispersal of waste.

### **Economic and Social Issues**

- Complement society's core values; create economic opportunities, profitable companies and jobs; and ensure long-term food security in the United States.
- Production from open ocean aquaculture won't address the U.S. seafood deficit.
- Open ocean farms won't be "mom and pop" operations, rather huge industrial farms.
- Do not provide too many industry incentives to start up an industry.
- Recognize that the world needs to eat more seafood. The human brain is 60% fat and our brains need essential fatty acids and the best source of this is fish. Children of the world need seafood. The lack of seafood negatively impacts the development of our children.
- We need to focus on affordability, not availability. U.S. farmed fish is an excellent source of omega-3s but most Americans cannot afford to eat the recommended daily amount.
- Recognize that there is a direct relationship between seafood consumption and reduction of depression and the reduction of heart disease. There is an increased health care cost caused by high consumption of animal fats.

### **Environmental Issues**

- Climate change will decrease arable land and will push farmland dramatically northward; therefore farming our oceans is the long-term way of providing food to the global population.
- Create strong effective rules to limit the environmental effects of aquaculture.
- Aquaculture has a myriad of impacts and will open up another line of assault on the seas. Existing laws do not provide an adequate framework.
- Siting must be done in a manner that won't affect essential fish habitat (EFH).
- Escapes disrupt food chains and ecosystems. NOAA needs strict standards to minimize finfish escapes and take into account weather events.
- Cultured product should be the same genotype as wild stock.
- Aquaculture facilities need to keep a record of escapes and tag all fish produced.

- Use only feed from a sustainable source and only use fish oil and fish meal when other options aren't available.
- Aquaculture operations attract predators, so those facilities need to employ the best available technology to deter predators.
- Aquaculture just provides unwanted pollution from excess effluents.
- Recognize that aquaculture has negative public health impacts and creates impediments to navigation.
- Recognize that California will not support any policy that allows any negative impacts.
- NOAA should develop strong environmental standards to protect the commons.
- NOAA should prohibit antibiotics and chemicals except in an emergency.
- Promote the use of closed, recirculation aquaculture.
- Aquaculture causes large die-off of species because it limits genetic diversity.
- Recognize that the federal government has destroyed wild salmon populations with their dams and that the Gulf is being destroyed by test wells, which is also a failure by the federal government.
- To minimize the impacts of aquaculture, NOAA should set rigorous and enforceable environmental standards.
- Recognize that the United States is the place to do aquaculture right. Currently, we export our environmental and social problems to other countries. These countries will shortcut food safety.
- USDA does not inspect enough foreign seafood imports. We need to control our own seafood production by having a robust domestic aquaculture industry.
- Use algae to feed herbivorous fish. Focus less on using wild fish to feed aquaculture because it is not sustainable.
- Most fishmeal already comes from sustainably harvested stocks, but we should still focus our efforts on alternative aquaculture feeds to keep costs down.
- Alaska constantly allows the releases and "escape" of salmon to supplement wild harvest, so there is already a model to handle controlled escapes of aquaculture fish.

### **Aquaculture in Federal Waters**

- Open ocean aquaculture presents a number of problems and we must stop the use of pesticides for shellfish and finfish aquaculture.
- Recognize that there are concerns with opening oceans to aquaculture.
- Open ocean aquaculture could provide food, but only if there is a national regulatory framework.
- Advocate for a national framework and not a regional approach for offshore aquaculture.
- If NOAA decides to allow aquaculture in federal waters in California then the federal government is giving away a public resource and that is not legal.
- California aquaculture standards are the strongest in the nation, and strictly enforced aquaculture standards protect consumers and the ocean, but a comprehensive federal framework is important to California.

### **Institutional/Regulatory Concerns**

- The United States should establish a permit system that is not a property right and not longer than 5 years and reviewed annually.
- It's critical that any NOAA policy use precautionary principles and have legislation at least as stringent as California's Sustainable Oceans Act.
- Ensure that a new policy is consistent with state policies and regulations.
- Coordinate the NOAA Aquaculture Policy with the federal Ocean Policy Taskforce and the Marine Spatial Planning Task Force.
- Develop clear, transparent, and coordinated science-based adaptive management for marine aquaculture.
- Adopt science-based and precautionary approach to management.
- NOAA needs to work with Congress and California to come up with a solution and that solution must involve California community members and set a high environmental bar.
- California is a model for environmental standards, but look to the Midwest to host on-shore aquaculture facilities.
- Lead national agency for marine aquaculture needs to be NOAA.
- Employ models of due diligence to develop a new policy for aquaculture. There needs to be a sufficient number of stakeholders involved and access to funding. NOAA is actively engaging experts and could model process on other consultative models like the World Wildlife Fund's salmon and shellfish dialogs.

### **Market Development**

- The United States has 30 years left of minable phosphorus, and therefore the United States will be dependent on other countries for food imports at that point because of this loss of phosphorus. We can fix this by growing the U.S. aquaculture market.
- We need aquaculture to feed the world and North America can exert a lot of market pressure.
- If we continue to rely on foreign imports then the United States loses its market influence. We need to develop our own domestic production and markets for aquaculture.

### **International**

- NOAA needs to look internationally for examples and other alternatives, such as land-based multitrophic aquaculture.

Following the final comment, Dr. Blackburn thanked participants, NOAA Aquaculture Program staff, and the U.S. Geological Survey, and she encouraged participants to submit comments online and adjourned the listening session.

(See next page for list of attendees)

Attendees/participants at the NOAA Aquaculture Listening Session  
in Menlo Park, California

First Name	Last Name	Affiliation	Speaker
David	Anderson	Aquarium of the Pacific	
Colleen	Bednarz	Save Our Shores	x
Heather	Benz	Stanford University	
Alex	Brannan	Stanford University	
Alice	Chiu	Stanford University	x
James	Ferro	The Ocean Conservancy	
Melissa	Foley	Center for Ocean Solutions	
Victoria	Galitzine	Fishwise	
Andy	Gerhart	Stanford University	
Zeke	Grader	Pacific Coast Federation of Fisherman's Associations	x
Marcela	Gutierrez	Wildcoast	x
Kalle	Hirschbein	Pacific Coast Federation of Fisherman's Associations	x
Paul	Hobi	citizen	
Cheriel	Jensen	Protect Our Valley	x
Dave	Jones	LiveFuels	
Dave	Klinger	Stanford University	
Hillary	Lane	University of Maryland	
Anna	Lee	citizen	
George	Leonard	The Ocean Conservancy	x
Marie	Logan	Food & Water Watch	x
Heather	Ludemann	Packard Foundation	
Amber	Mace	Ocean Protection Council	
Heather	McIntire	California Dept. of Fish & Game	
Jim	Moore	California Dept. of Fish & Game	
Sian	Morgan	Fishwise	x
Lissa	Morgenthaler-Jones	LiveFuels	x
Stephanie	Mutz	CFSB	
Paul	Olin	California Sea Grant	x
Adelaide	ONeal	Stanford University	
Erin	Prahler	Center for Ocean Solutions	
Ken	Robertson	DSM	x
Jeff	Russell	Natural Resources Defense Council (NRDC)	x
David	Stephen	Ecoploston Inc.	
Frank	Sudra	POD Energy, Inc.	
Cassidy	Teufel	California Coastal Commission	x
Desiree	Walker	citizen	

<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>	<b>Speaker</b>
Paul	Weakland	citizen	x
Keith	Weissglass	Office of California State Senator Joe Simitian	x
<b>Scientific Expert</b>			
Chris	Langdon	Oregon State University	
<b>NOAA Staff</b>			
Christine	Blackburn	NOAA	
Brian	Fredieu	NOAA Aquaculture Program	
Laura	Hoberecht	NOAA Fisheries Southwest Regional Office	
Kate	Naughten	NOAA Aquaculture Program	
David	O'Brien	NOAA Aquaculture Program	