



**Summary of NOAA's Aquaculture Listening Session  
Ala Moana Hotel  
Honolulu, Hawaii  
April 27, 2010**

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**Chair:** Andrew Winer, NOAA Director of External Affairs

**Scientific Expert:** Dr. Jo-Ann Leong, Hawaii Institute of Marine Biology

**Participants:** 78

**Public Comments:** 29

Held on April 27, 2010, this listening session was the fourth in a series of public listening sessions conducted by the National Oceanic and Atmospheric Administration (NOAA). The complete list of meetings is available on the NOAA Aquaculture Program website at <http://aquaculture.noaa.gov>.

At 2:00 p.m., Andy Winer, NOAA's Director of External Affairs, 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. Winer also noted that, for purposes of the NOAA policy, aquaculture is defined as the propagation and rearing of aquatic marine organisms in aquatic environments for any commercial, recreational, or public purpose. He noted that the definition 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
4. Restoration of marine habitat (e.g., oyster reefs)

The chairman also noted that:

- The policy will provide a foundation for sustainable aquaculture that will create employment and business opportunities in coastal communities; provide safe, sustainable seafood; and complement NOAA's comprehensive strategy to maintain healthy and productive marine populations, species, and ecosystems and vibrant coastal communities.
- NOAA is particularly interested in hearing ideas about how the policy can most effectively guide and support science; provide clear regulations; support outreach, education, and innovation; and define the U.S. role in this international industry.
- 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 and the 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 a national teleconference on May 6<sup>th</sup> 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. Winer then introduced Dr. Jo-Ann Leong and highlighted her scientific experience. He noted that Dr. Leong is the Director of the Hawai'i Institute of Marine Biology and Professor in the School of Ocean & Earth Science & Technology at the University of Hawai'i at Mānoa. She is a Distinguished Professor Emeritus of Microbiology and the former Chairman of the Department of Microbiology at Oregon State University. She is also an elected member of the American Academy of Microbiology and is President Elect of the National Association of Marine Laboratories. She is also the Chairman of the Board of Directors for the Center of Tropical and Subtropical Aquaculture in Hawai'i.

Dr. Leong co-chairs the Ecosystem Science and Management Working Group for the NOAA Scientific Advisory Board and is a member of the National Committee of the Census of Marine Life. She served as the editor of the Viral Diseases section of Diseases of Aquatic Organisms for more than 10 years and was on the Editorial Board of Marine Molecular Biology and Biotechnology and the Journal of Marine Biotechnology. Dr. Leong has published over 100 refereed research papers that resulted from the work of her 18 doctoral students and six M.S. students. She holds three patents for the first viral vaccine for fish and the first DNA vaccine for cultured species in the U.S. The chair also noted that Dr. Leong retains funding from National Science Foundation and NOAA.

When Dr. Leong's presentation was over, Mr. Winer then asked Dr. Leong to read a statement submitted by U.S. Senator Daniel K. Inouye to begin the comment period. The text of [Senator Inouye's statement](#) is available online.

Mr. Winer then opened the floor for public comments. Twenty nine people signed up to give remarks. They were called on in random order. Please see the list at the end of the document for the names and affiliations of the people who attended and gave comments.

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The following list is a condensed version of the public comments given at the listening session as compiled by the NOAA Aquaculture Program staff.

**The new NOAA marine aquaculture policy should:**

**Technology and Innovation**

- Support research on the use of waste products from seafood and biofuel processing to develop alternative ingredients for aquaculture feeds.
- Support an increase in funding for NOAA's marine aquaculture program with emphasis on research and technology development.
- Support more funding for technologies to increase production, not just to measure environmental impacts.

**Economic, Cultural and Social Issues**

- Foster "balance" in discussing various aspects of marine aquaculture (e.g., environmental impacts, seafood safety and job creation, cultural issues).
- Take into account Hawaii's cultural values and history, including fishing traditions.
- Recognize that a certain number of aquaculture operations is a benefit, while too many would be a liability.
- Recognize that the high level of seafood imports is a concern in the context of food safety and security.
- Recognize Hawaiian traditional fish ponds as examples of aquaculture that has a long tradition, has local buy-in, and may be more environmentally benign than other types of aquaculture.
- Recognize that wild fisheries are not sufficient to support seafood demand, and that recent fishery closures highlight and exacerbate the issue. Wild caught and

aquaculture are both essential. With closure of some Hawaiian waters to commercial fishing, aquaculture is the only option for new supply. Aquaculture and fishing can work together.

- Aquaculture has strong support in Hawaii and is culturally and economically compatible with society in the Pacific Islands. Aquaculture operations in Hawaii have been supportive of local culture.
- Include an emphasis on local outreach to address concerns by fishermen.
- Note the cultural importance of providing culturally significant and/or local fish to residents and tourists and that aquaculture might be the only/best approach for some species.
- Support creation of “green” jobs through domestic aquaculture.
- Recognize that a U.S. seafood farm will provide jobs, tax revenues, and other economic benefits.
- Hawaii’s restaurants and chefs value and feature Hawaii’s aquaculture products. There is a huge demand for local cultured seafood products but restaurants need more local, affordable supply.
- While we can not return to the past, Hawaii should explore local designs and opportunities to build on Hawaii’s cultural heritage with environmentally benign forms of aquaculture that have local support.

#### **Environmental and Human Health Issues**

- Recognize the human health benefits of eating more seafood as a rationale for more aquaculture production.
- Use a range of options to help minimize environmental concerns, including:
  - support integrated multi-trophic approaches;
  - develop ways to use less forage fish (e.g., growing herbivores, developing alternative feeds);
  - prohibit use of antibiotics and chemicals, non-native species and GMOs;
  - restore Hawaii fish ponds;
  - develop land-based systems; and
  - ensure that aquaculture does not negatively impact wild fisheries.
- Recognize that some of the environmental problems with aquaculture cited by environmental groups are not present in Hawaii and/or the United States.
- Hawaii has very high regulatory and environmental standards and is a good model for environmentally responsible aquaculture.
- Recognize that potential environmental and societal concerns could be addressed through proper management, local input, and outreach.
- Hawaii is not a laboratory for the aquaculture industry to use to make money off of the ocean. Need to use traditional methods and restore Hawaiian fish ponds.
- Hawaii has sustainable forms of aquaculture: there is a need to expand the Hawaiian aquaculture model nationally.
- Support sustainable ecologically sound aquaculture, but have reservations about large industrial fish farms.

### **Aquaculture in Federal Waters**

- Support development of a regulatory system with national standards that allows flexibility for local input and approaches.
- Do not support open ocean aquaculture but, instead, support restoring Hawaiian fish ponds, and developing aquaponics and/or land-based aquaculture systems.
- Put the size of an average open ocean aquaculture operation in perspective (i.e., relatively tiny in the context of the vastness of the U.S. Exclusive Economic Zone).
- Recognize that offshore aquaculture should be managed by NOAA, not the regional fishery management councils.
- Recognize that the regional fishery management councils have a crucial role to play in authorizing aquaculture in U.S. federal waters.
- Allow NOAA to authorize a small number of permits for offshore aquaculture demonstration projects, and use information from these permits to guide future direction.

### **Other Institutional and Regulatory Issues**

- Note that the recent Superferry project is a model to avoid.
- Ensure that marine aquaculture is explicitly considered in NOAA's efforts in coastal and marine spatial planning (CMSP).
- NOAA's Ten Year Plan for Marine Aquaculture is excellent and is a good model for NOAA's new aquaculture policy.

### **Market Development**

- Recognize sustainable aquaculture as one element of a sustainable economy.

### **International**

- Recognize that seafood demand is rising in places like China, which could result in less and/or more expensive supply in the future.
- Support reducing seafood imports by fostering more domestic aquaculture production.
- Note that Hawaii is particularly at risk for disruptions in seafood supply due to its highly isolated location.

Following the final comment, Mr. Winer thanked participants and adjourned the listening session.

(See next page for list of attendees.)

<b>First Name</b>	<b>Last Name</b>	<b>Affiliation</b>	<b>Speaker</b>
Z	Aki	Kahiau - University of Hawaii - Hawaii'i 'imiloa	<b>x</b>
Toby	Arakawa	Tropic Fish Hawaii	
Michael	Berman	Olomana Gardens & Aquaponics World Order	<b>x</b>
Keiko	Bonk	Marine Conservation Biology Institute	<b>x</b>
Meredith	Brooks	Center for Tropical and Subtropical Aquaculture	
Robert	Burns	Olomone Gardens	
Lois	Cain	HAAA	
Natalie	Casit	Olomana Gardens	
Randy	Cates	Cates International	<b>x</b>
Steve	Chaikin	Molokai Sea Farms	<b>x</b>
Steve	Chen	member of the public	
Leighton	Chong	Hawaii NEI	
John	Corbin	Aquaculture Consultant	<b>x</b>
Kelly	Davidson	NOAA	
Joshua	DeMello	Western Pacific Fishery Management Council	
Steve	Dolar	University of Hawaii	<b>x</b>
Lynn	Dziad	member of the public	
Kai	Fox	Univesity of Hawaii - CTAHR	
Neal	Frazer	University of Hawaii - Manoa	<b>x</b>
Mike	Fujimoto	Hawaii State Dept. of Land & Natural Resources	
Laura	Hamilton	NOAA	
Chris	Hawkins	NOAA Fisheries	
Todd	Hendricks	member of the public	<b>x</b>
Dominique	Horvath	member of the public	
Shaina	Hunt	Kahiau (LCC) Hawaii 'imiloa	
Zeni	Iese	member of the public	
Alan	Iversom	NOAA Pacific Islands Regional Office	
Bonnie	Joseph	NOAA CRED	
Kimokeo	Kapahulehua	Maui Fresh Fish - Ao Ao Ona Loko la Maui	<b>x</b>
Gary	Karr	Western Pacific Fishery Management Council	
Kiana	Kauwe	Save Our Seals Campaign	
David	Kawahigieski	Aquaculture Consultant	
Hi'ilei	Kawelo	Paepae O He'eia	
Kristina	Kekuewa	NOAA Pacific Islands Regional Office	
Kevin	Kelly	Tetra Tech	
Amy	Klein	U.S. Army Corps of Engineers	
Kelli	Kotubetey	Paepae O He'eia	
Charles	Laidley	Oceanic Institute	
Todd	Low	Hawaii Dept. of Aquaculture	<b>x</b>
John	Lynham	University of Hawaii	
Ben	Markus	Hawaii Public Radio	
Sean	Martin	Western Pacific Fishery Management Council & Hawaii Longline Association	<b>x</b>
Glenn	Martinez	Olomana Gardens	<b>x</b>
Brian	Miyamoto	Hawaii Farm Bureau Federation	<b>x</b>
Tom	Morelli	Aquaculture Hub at the University of Hawaii	

First Name	Last Name	Affiliation	Speaker
Bruce	Mundy	NOAA Pacific Islands Fishery Science Center	
Norman (Puna)	Nam	Cinnamon's Restaurant	x
Ronnie	Nasuti	Roy's Restaurant	x
Pat	Opay	NOAA Fisheries	
Tony	Ostrowski	Oceanic Institute	x
Michael	Parke	NOAA Pacific Islands Fishery Science Center	
Rob	Parsons	Pono Aquaculture Alliance/Food & Water Watch	x
Linda	Paul	Hawaii Audubon Society	x
Sarah	Pautzke	Western Pacific Fishery Management Council	
Don	Polhemus	Bishop Museum	
Mara	Raewle	member of the public	
Dave	Raney	Sierra Club	x
Alison	Rieser	University of Hawaii - Manoa	
Allen	Riggs	ADP - HDOA Hawaii Aquaculture	
Benny	Ron	University of Hawaii	x
Kelley	Sage	NOAA National Marine Sanctuaries	
David	Sakada	Student, University of Hawaii	
Michael	Seki	NOAA Pacific Islands Fishery Science Center	
Bill	Spencer	Hawaii Oceanic Tech, Inc.	x
Krisna	Suryanata	University of Hawaii	
Dave	Takaki	Aquaculture Hub at the University of Hawaii	x
Brooks	Takeneka	United Fishing	
Clyde	Tamaru	CTAHR/MRBE	x
Marti	Townsend	KAHEA	x
Fred	Tucker	NOAA	
Stephen	Van Kampen-Lewis	Oceanic Institute	x
David	Walfish	member of the public	
Kehau	Watson	SAC	x
Ron	Weidenbach	Hawaii Aquaculture & Aquaponics Association	x
Brad	Wong	Nature Conservancy	
Paul	Wong	NOAA National Marine Sanctuaries	
Toby	Wood	NOAA Pacific Islands Regional Office	
Shirley	Yamada	Hawaii DOE (retired)	
<b>Scientific Expert</b>			
Jo-Ann	Leong	Hawaii Institute of Marine Biology (HIMB)	x
<b>NOAA Staff</b>			
Andy	Winer	NOAA	
Michael	Rubino	NOAA Aquaculture Program	
David	O'Brien	NOAA Aquaculture Program	
Kate	Naughten	NOAA Aquaculture Program	
Wende	Goo	NOAA Pacific Islands Regional Office	
Shelly	Steele	NOAA Pacific Islands Regional Office	
Kathleen	Uno	NOAA Pacific Islands Regional Office	