

**Answers to follow-up questions from Kenneth Chew
Aquaculture Panel
U.S. Commission on Ocean Policy
(Questions addressed September 13, 2002)**

**** What is the approximate level of Federal funding being spent on marine aquaculture research today, and how does this compare with the level of support being provided in other countries?**

Information on dollar amounts towards marine aquaculture research was difficult to obtain, as there were so many different avenues that funds have been garnered towards this area of undertaking. I will take an uneducated stab at this through general discussions with several people such as Susan Bunsick of NMFS/NOAA, Jim McVey of the National Sea Grant Office, and Meryl Broussard of USDA. This does not preclude other Federal groups as NSF, EPA, FDA, etc who have supported studies touching upon marine microbiology, molecular biology, diseases, environmental/pollution issues related in some way to marine species of cultured organisms. Roughly, for NMFS, Sea Grant, and USDA combined might be expressed as **\$30 to \$40 million** for the past year for marine aquaculture research. This does not include the question of loans, subsidies, SBIRs, and competitive grants.

As for other countries, I am somewhat aware of what **China**, the leading country in global aquaculture may be putting emphasis on now. Marine aquaculture is the big thing these days, not to down-play the importance of carp and other freshwater species of fish. My guess is that government support and subsidies are probably up to around **\$200 to 400 million** towards aquaculture for research and aquatic culture improvements. I do not know the actual percentage of this towards marine research, but there is increasing funding towards research in high valued marine species.

My contacts with several people show that the **European Union** have proposed **\$430 million** into fisheries and aquaculture, with probably 50% to marine aquaculture. **Canada** has proposed **\$35 million** into aquaculture. **South Korea** is prepared to invest in the next three years **\$1 billion** into fisheries and aquaculture. **Japan** falls around **\$100 million** into aquaculture, with marine aquaculture research a significant portion of the funding I understand.

In summary for past year:

- US marine aquaculture research = estimated roughly \$30 - \$40 million
(Only for NMFS, Sea Grant, USDA—please note above for others not included)
- Other countries: China = \$200 to 400 million possibly. Increasing % to marine aqua
European Union = \$430 million (approx. 50% to marine aqua)
Canada = \$35 million into overall aqua. % marine ??

South Korea = \$1 billion into fisheries and aqua next 3 yrs. For
Marine research ??.
Japan = around \$100 million into aqua. Major % to marine aqua

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****Should the Federal Government promote aquaculture development in the U.S., or is the proper role for the Federal Government to set standards to protect the environment and human health, providing a predictable, understandable regulatory framework for the industry?**

I have taken the liberty to talk to several people knowledgeable about aquaculture about this question. One person especially, who is well respected in this area of concern, offering input was Kenn Brooks of Aquatic Environmental Sciences. This question I might address in two parts:

1. In terms of managing the potential environmental effects caused by aquaculture, the government should define uniform standards. Zero effect is not an acceptable standard. On the one hand, appropriate standards must recognize the value of the food produced by aquaculture and define realistic allowable effects. Those effects should be key to natural aquatic productivity. Not to some arbitrary standards. Mariculture can be sited over unproductive environments. Under any circumstances aquaculture should not be allowed to reduce natural productivity beyond some allowable point. I also would note that uniform standards that do not account for the varying productivity in aquatic environments are easier to define and implement. However, such uniform standards also dismiss the value of proper aquaculture siting – which can significantly diminish environmental effects.

Identification of allowable effects and development of suitable standards should be a multi-disciplinary (and multi-jurisdictional) effort. One of the problems we continually encounter is what one might call one-dimensional thinking in government agencies. Habitat Conservation biologist think only in terms of protecting all habitats – including those that are minimally productive. Stock enhancement biologist too frequently focus on the mass production of fish with little concern for the environment. Governmental biologist defending threatened and or endangered species care only about those species and with that single focus, they continually push the limits of their authority. We desperately need multi-dimensional thinking in these agencies. That means leadership from the very top to clearly define and enforce rational policy.

2. Should the federal government encourage aquaculture? Aquaculture is about feeding the world's burgeoning population by supplementing wild fisheries with intensively cultured aquatic protein. The land-grant university system and government subsidies to understand and improve all aspects of grain, fruit, hog and chicken production have created a green revolution that has enormously increased the world's food supply. Agriculture could not possibly produce the quantity of poultry at such low

cost without federal government's investment in genetic and feed programs. There

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has been minimal funding of aquaculture research by federal and state governments over the last fifty years. This needs to change if we are to keep up with the global efforts from other countries.

II. Is there a need to consolidate Federal responsibility for aquaculture under one agency and, if so, what would be the benefits?

If you were to ask this question of a spectrum of stakeholders in this issue – you would get a spectrum of responses. Waterfront property owners and habitat managers would probably answer yes, and they would argue that aquaculture should be managed by either habitat conservation managers or endangered species biologists. If you were to ask producers or consumers of cultured fish and shellfish, they would that it should be managed by people who are more sensitive to production needs. The real problem is not so much which agency or group manages aquaculture, as it is a matter of leadership to force all participants to work together in a proactive way to achieve clearly defined goals.

A National Policy is already in place through legislation with USDA bringing together the Joint Subcommittee on Aquaculture (JSA) to have all federal agencies work together to build the federal aquaculture thrust. As noted in my testimony to you in Seattle, there has been an air of protectionism (turf concerns) and not full open dialogue between agencies when they get together in the JSA meetings it appears. Although perhaps better now, as stakeholders are getting the message to the federal agencies that coordination/cooperation is a must—but still a long ways to go!

Efficiency requires a well-defined and stable organization responsible for all aspects of aquaculture. That organization can be housed in a single agency or it could be a multi-agency effort. In reality, aquaculture development came to USDA as the lead agency because leadership in other federal agencies were disinterested in the late 1970's and early 1980's. This led to the formation of the JSA as the vehicle which all aquaculture related federal agencies were to get together to coordinate programs and cooperate in a common thrust to promote U.S. aquaculture. This still can be done if a clear message is provided by legitimate leadership and authority from the top-down. I would like to see this happen.

Finally, the federally developed National Aquaculture Plan which was developed through the JSA is long overdue. This plan had input from stakeholders and all federal agencies--
- in the meantime more workshops are being arranged and funded by different groups (including federal) involving stakeholders and subsequently new plans and ideas are being noted and/or adopted in discrete areas of aquaculture needs. Obviously, from a global and national interest in recent years, if not the past ten to twenty years, it's exponential in growth.

