A New PICES Working Group Holds Workshop and Meeting in Jeju Island

by Kevin Amos and Katsuyuki Abo

The newly formed PICES Working Group on *Environmental Interactions of Marine Aquaculture* (WGEIMA; WG 24) convened its inaugural meeting and sponsored a workshop at the 2009 PICES Annual Meeting held in October, in Jeju, Korea. This Working Group operates under the auspices of the Marine Environmental Quality (MEQ) and Fishery Science (FIS) Committees.

As marine aquaculture evolves around the world, significant fish and shellfish culture activities are occurring in PICES member countries. Considering that the potential exists for interactions to occur between culture facilities and the surrounding ecosystems, WGEIMA has embarked on an effort to better understand these interactions and assess their risk. Our primary mission is to develop standard methods and tools to assess and compare the environmental interactions and characteristics of existing and planned marine aquaculture activities in PICES member countries. The following action plan (terms of reference) were approved at the formation of WGEIMA:

1. Evaluate approaches currently being used in PICES member countries to assess and model the interactions of aquaculture operations with surrounding environments. (This will involve conducting a comparative assessment of the methodologies, applications, and outputs of different approaches to assess finfish, shellfish, seaweed, and/or integrated multi-tropic aquaculture.)
2. Review and evaluate current risk assessment methods used to assess environmental interactions of aquaculture and determine what, if anything, should be changed for their application in PICES member countries to reflect ecosystem-specific aspects. Following the review and assessment, identify appropriate case studies to compare results among countries in the PICES region. (This will be achieved by holding a workshop in the second or third year to compare and discuss possible standardization of methodologies and the selection of potential case studies for assessment with a standardized approach. Functions and responsibilities of the sub-group undertaking this task will be similar to the ICES Working Group on *Environmental Interactions of Mariculture*, so the feasibility of holding a joint meeting with this group will be explored.)
3. Assess methods to detect, identify, evaluate and report on infectious disease events and potential interactions between wild and farmed marine animals. If appropriate, develop a recommended standardized approach for detection/evaluation/reporting from wild and cultured populations. The focus of this activity will be on OIE-notifiable diseases and other infectious diseases of regional/economic importance. (This will involve discussing and documenting new and emerging infectious diseases in the PICES region, methods for their detection, and developing models to conduct risk assessments of their potential impacts on both endemic wild and farmed species. Functions and responsibilities of the sub-group undertaking this task will be similar to the ICES Working Group on *Pathology and Diseases of Marine Organisms*, so the feasibility to hold a joint meeting will be explored.)

On October 24, WGEIMA held it first major activity – a workshop on "*Interactions between aquaculture and marine ecosystems*" co-convened by Katsuyuki Abo (Japan), Kevin Amos (U.S.A.), Galina Gavrilova (Russia) and Hyun Jeong Lim (Korea). The major objective of the workshop was to discuss tools and models currently used by PICES member countries to evaluate interactions of marine aquaculture and assess the risks of these interactions. Three noted experts were invited to the workshop to share with us their models and research. Dr. Dario Stucchi (Fisheries and Oceans Canada) has been studying how currents, tides, and other oceanographic conditions disperse sea lice larvae from salmon farms to the marine ecosystems in the Broughton Archipelago, British Columbia, Canada. There is concern that lice from salmon farms may be infecting, and subsequently impacting, wild salmon populations, and Dr. Stucchi's models will be utilized in helping to better understand this potential pathogen interaction.

The fate of effluent and nutrients from marine farms is the focus of *AquaModel* developed by Dr. Jack Rensel (Rensel Associates Aquatic Sciences, U.S.A.). Like Dr. Stucchi's models, his model explores physical and chemical oceanographic phenomena to determine if and how effluents from fish farms may interact with marine ecosystems. His data suggest that improperly sited farms may have negative impacts while properly sited farms have no impact or possible benefits on nutrient-poor ecosystems.

Dr. Tamiji Yamamoto (Hiroshima University, Japan) has been focusing on effects of culture density on the growth and fecal production of the oyster *Crassostrea gigas* in Hiroshima Bay. His model expresses physiological processes of the oyster as well as physical and chemical oceanographic phenomena. His study has suggested the appropriate cultivation density under the environmental conditions of the Bay.

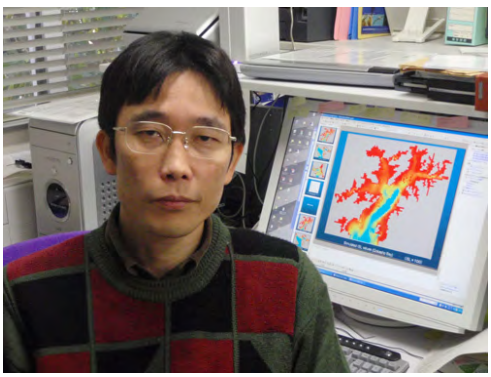
Many other speakers presented interesting research on various aspects of marine aquaculture, including possible interactions of effluents, pathogens, and genetics. Brief information on all presentations can be found in the Book

Participants of the WGEIMA workshop and meeting at the end of a field trip, October 25, 2009, Jeju, Korea.

of Abstracts for PICES-2009, along with contact information for each author.

After the successful workshop, WGEIMA held a half-day meeting to discuss the next steps to be taken. In the near term, we will attempt to reach consensus on types/methodologies of aquaculture that have commonality in all PICES member countries and then start to identify and develop risk assessments associated with these technologies. For more details on the meeting please refer to the 2009 PICES Annual Report. Next time, WGEIMA will meet in conjunction with the 2010 PICES Annual Meeting (Portland, U.S.A.), but there will be much interaction among the Working Group members before we gather together again in Portland.

Our activities in Jeju were capped off by an excellent field trip hosted by Korea and organized by Dr. Hyun Jeong Lim. This half-day trip took us first to a flounder aquaculture farm operated by *Bibong Aquaculture*. The flounder were being raised in land-based concrete tanks with seawater being pumped through volcanic rock immediately adjacent to the ocean. Our next stop was an abalone farm operated by *Jeil Hatchery*. Like the flounder farm, this farm was utilizing pumped seawater into land-based tanks. The abalone are fed kelp and take 3 to 4 years to reach market size. Our final stop was a visit to a Korean Culture Park that exhibited the various life styles, dwellings, and historic farming techniques utilized by the Korean natives in the countryside. All participants greatly enjoyed the trip – thanks Dr. Lim!!!



Dr. Kevin Amos (Kevin.Amos@noaa.gov) is the Aquatic Animal Health Coordinator for the U.S. National Marine Fisheries Service. His professional interests include aquatic animal health policy, international commerce of aquatic products, and marine aquaculture. In PICES, Kevin serves as Co-Chairman of the Working Group on Environmental Interactions of Marine Aquaculture. Out of the office you might find Kevin on the golf course or pursuing salmon with a rod and reel.

Dr. Katsuyuki Abo (abo@fra.affrc.go.jp) is a senior researcher at the National Research Institute of Aquaculture, Fisheries Research Agency, Japan. His research focuses on water and benthic qualities of marine aquaculture area, using numerical models to estimate the assimilative capacity. His scientific interest includes modeling study to predict occurrences of harmful algal blooms and oxygen depletion in coastal seas. In PICES, Katsuyuki co-chairs the Working Group on Environmental Interactions of Marine Aquaculture.