

International symposium on “Reproductive and Recruitment Processes of Exploited Marine Fish Stocks”

by Richard D. Brodeur and Suam Kim

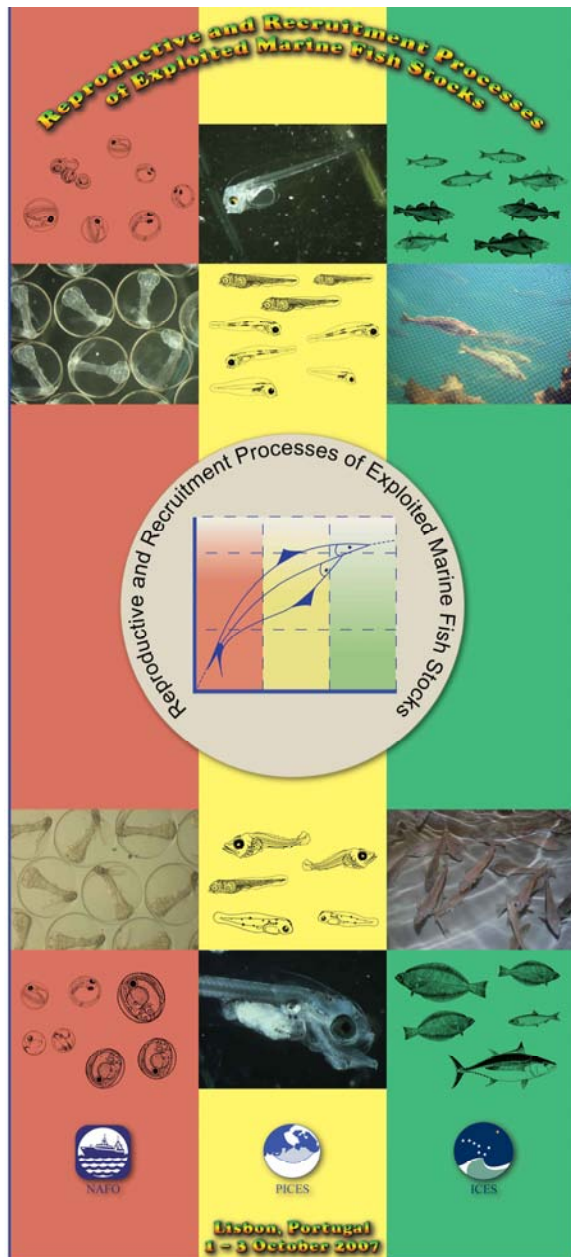
The North Pacific Marine Science Organization (PICES), the Northwest Atlantic Fisheries Organization (NAFO) and the International Council for the Exploration of the Sea (ICES), sponsored an international symposium on “Reproductive and Recruitment Processes of Exploited Marine Fish Stocks” held on October 1–3, 2007, in Lisbon, the historic capital of Portugal. The symposium was organized by the NAFO Secretariat and convened by Drs. Edward A. Trippel (representing NAFO), Richard D. Brodeur (PICES) and Mark Dickey-Collas (ICES), with

support from a Scientific Steering Committee that included Drs. Suam Kim (Korea) and Jie Zheng (U.S.A.) from the PICES community.

It has been almost a decade since the topic of fish reproduction and recruitment has been addressed at a symposium, and it was felt that this area of research was ripe for an attempt at integration and synthesis. The participation by the scientific community reflected this as 151 scientists and managers from 23 countries and 6 continents attended this 3-day symposium and presented 52 talks and 70 posters.

The symposium was led off with a stimulating keynote talk by Dr. Ed Houde of the University of Maryland entitled “*Emerging from Hjort’s shadow*”, which outlined the history of recruitment research starting with the famed Norwegian scientist Johan Hjort (1869–1948), who introduced the “critical period” hypothesis that framed much of the early research on recruitment. Dr. Houde brought us up to date on the current thinking on the physical and trophodynamic factors that affect fish survival and, ultimately, recruitment. He also challenged us to examine paradigms currently directing research on fish reproduction and recruitment, and highlighted some of the recent advances made by many interdisciplinary programs initiated in the last couple of decades on these topics. Dr. Houde emphasized that all life stages of fishes are important in generating variability, and thus are potentially critical in generating year-class fluctuations. He concluded by stating that: “*Solving the recruitment problem is no longer the holy grail of fishery science. Appreciating recruitment variability, explaining probable causes, considering implications for management, and understanding it in the context of broader variability in marine ecosystems are worthy goals.*”

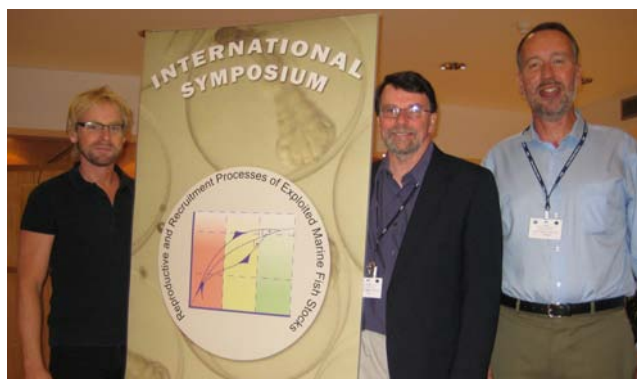
The overall meeting was structured along four main themes, each with two invited presentations and a number of contributed talks. The first theme dealt with “*Age and size at sexual maturation*”, with invited talks from Drs. Tara Marshall (UK) and Mikko Heino (Norway). The second was “*Fecundity and spawning success*”, with keynote addresses by Drs. Yvan Lambert (Canada) and David Armstrong (U.S.A.). Then the emphasis shifted to “*Survival of eggs and larvae*”, with invited presentations by Drs. Brian McKenzie (Denmark) and Yoshiro Watanabe (Japan). The final theme integrated among the previous topics with a slant toward “*Stock assessment and management implications*”, with a diverse spectrum of presentations and with invited talks by Drs. Joanne Morgan (Canada) and Louis Botsford (U.S.A.). Ending up on a



positive but cautionary tone, Dr. Keith Brander (ICES) summed up the presentations and gave his take on the progress in the field and suggested that the future will not be like the past, and we need to take a precautionary approach in managing fluctuating populations. He left us with the challenge “*How can we use all our new knowledge to guide sustainable management of marine ecosystems?*”

Similarly, the poster session held on the first evening had representation from a broad spectrum of topics and species of interest, with a strong representation of management applications. Although the majority of talks and posters examined finfish in marine waters, there were also several presentations on commercially important shellfish which have their own unique reproductive and life history patterns (sperm storage, multiple paternity). There was even a talk on freshwater fish reproduction and recruitment, and how these processes differed from those in the marine environment.

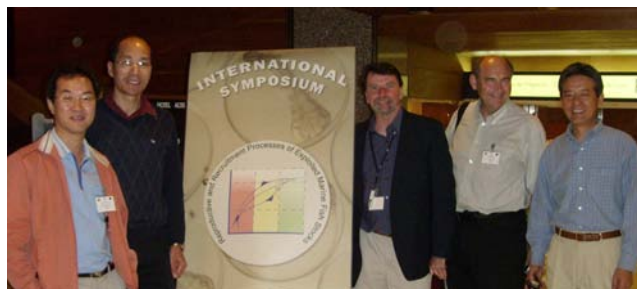
Altogether, the symposium was declared to be a successful integration of current thinking on these processes which may regulate production of most fish species. Several talks pointed out that due to the substantial variation in maturity rates, sex ratios, fecundity, spawning frequency, and viability of eggs, we can no longer use spawning stock biomass as an indication of reproductive output. The integration of management principles along with the science is a critical element, considering the present depressed state of many fish stocks and the potential for unknown trajectories in the presence of climate and anthropogenic changes that are occurring in most marine ecosystems. It is planned that suitable manuscripts from the meeting will be published in a special volume of the *Journal of Northwest Atlantic Fishery Science* in 2009. We feel that the PICES community can learn much, particularly in the area of maturation and egg production, from our Atlantic colleagues, who are perhaps a bit more cognizant of maternal as well as fishing effects on reproduction and ultimately fishery management and stock rebuilding policy, than we are in the Pacific Ocean.



Symposium convenors (left to right): Drs. Mark Dickey-Collas (ICES), Richard Brodeur (PICES) and Edward Trippel (NAFO).



Dr. Ed Houde (University of Maryland, U.S.A.) delivers the keynote address at the symposium.



PICES representatives at the symposium (left to right): Drs. Suam Kim (Korea), Jie Zheng (U.S.A.), Richard Brodeur (U.S.A.), Douglas Hay (Canada) and Yoshiro Watanabe (Japan).

Dr. Richard Brodeur (Rick.Brodeur@noaa.gov) is a Research Fisheries Oceanographer working at the Northwest Fisheries Science Center, NOAA Fisheries, and is based in Newport, OR. Ric received his B.S. in Fishery Science from the University of Massachusetts, his M.S. in Oceanography from Oregon State University, and his Ph.D. in Fisheries from the University of Washington. His dissertation research examined the feeding ecology of juvenile salmon and its relationship to ocean carrying capacity. Following a postdoctoral position at the Pacific Biological Station in Nanaimo, B.C. Canada, he began his career working on early life history and recruitment dynamics of walleye pollock in the Gulf of Alaska and Bering Sea for the Alaska Fisheries Science Center. He returned to Oregon to work again on habitat preferences and trophic ecology of juvenile salmon and other pelagic fishes as well as recruitment processes in marine fishes. Ric has been heavily involved with PICES, serving on several committees and working groups and organizing a number of special sessions at past meetings. He has published on a variety of topics ranging from satellite oceanography to fish bioenergetics to fisheries acoustics, but has focused much of his research on feeding and food web interactions centering on nekton.

Dr. Suam Kim (suamkim@pknu.ac.kr) received his B.Sc. (1976) and M.Sc. (1979) in Oceanography from the Seoul National University and his Ph.D. in Fisheries Oceanography from the University of Washington in 1987. Currently he is a professor of the Pukyong National University, in Busan, Korea. He served as the Director of the Polar Research Center of the Korea Ocean Research and Development Institute (KORDI) and Chairman of Korea GLOBEC. His areas of interest include fisheries ecology, especially recruitment variability focusing on early life histories of fish in relation to oceanic/climate changes. Suam represented Korea on several international organizations/programs such as PICES (Co-Chairman of the CCCC Program), GLOBEC (SSC member), CCAMLR (Vice-Chairman of the Scientific Committee), IPCC (Expert reviewer for the Fourth IPCC Report), IGBP and SCAR.