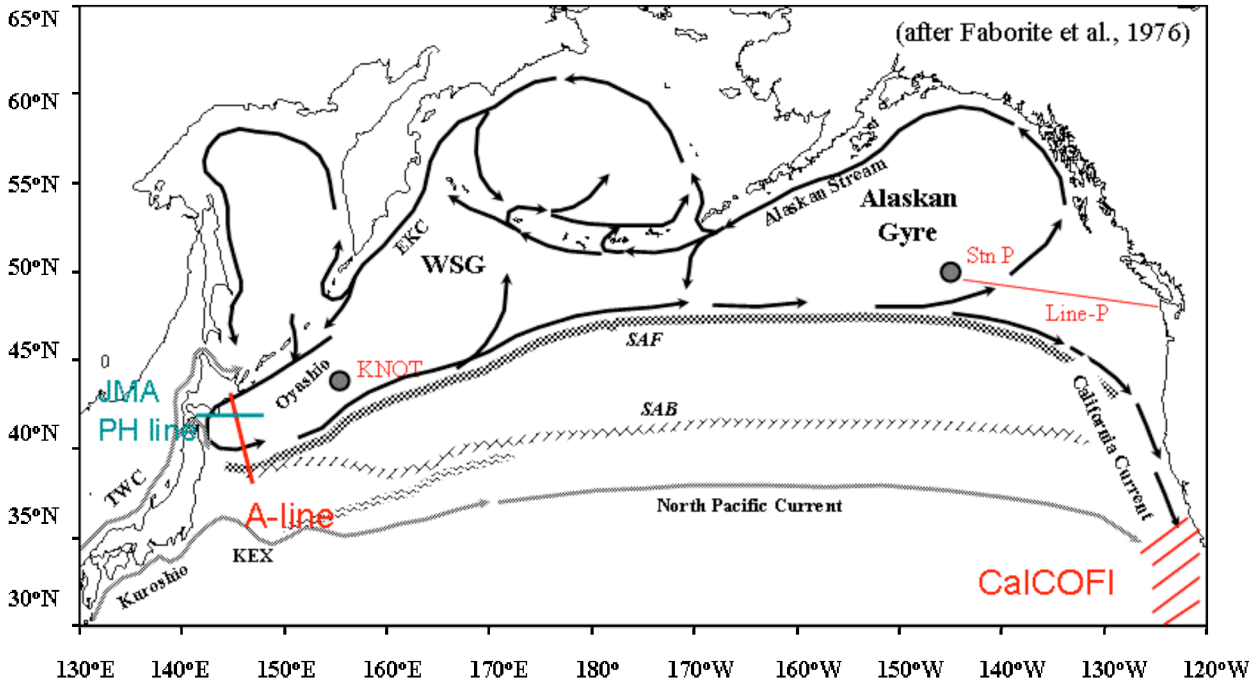
International Workshop on collaborative studies for ecosystem variation and climate change in the North Pacific



Dates: 21-23 October 2006

Place: National Research Institute of Fisheries Science
Yokohama, Japan

Co-chairs Prof. Tsuneo Ono and Prof. Hiroya Sugisaki

CCE LTER Attendees: Kathy Barbeau, Ralf Goericke, Michael Landry, David Checkley, Andrew King, Ryan Rykaczewski

Attendees from Japan: the National Research Institute of Fisheries Science, Nagoya University, Univ. of Tokyo, Marine Science and Technology Center (JAMSTEC) facility at Yokohama Institute for Earth Sciences, Hokkaido Univ.

Other Attendees: Institute of Ocean Sciences, Victoria, Canada; NOAA/NMFS Oregon, USA.

Workshop Program

Day 1:
1st day (10:00-17:00) Keynote review

Opening	H. Sugisaki
ODATE overview	H. Sugisaki
A-Line overview	T. Ono
CalCOFI overview	Mike Landry
Results of PICES-POC physical comparison activities	S. Ito
Results of PICES-CCCC NEMURO studies	M. Kishi
Results of PICES-BIO euphausiids studies	W. Peterson
Results of PICES-CCCC Sardine &Anchovy studies	V. Agostiwi

Day 2 Group Sessions
1. Comparison & synthesis of zooplankton biomass/species
   Chair: H.Sugisaki
2) Comparison and synthesis of phytoplankton and primary production data
   Chair: R. Goericke & T. Ono
3) Comparison & synthesis of zooplankton data and model output
   Chair: S. Ito
4) Discussion of iron & nutrient biogeochemistry
   Chair: Tsuneo Ono

Day 3 Group Sessions
Group Summary and Joint discussion

SUMMARY

Following a recommendation of the 11th Japan-US workshop on Global Change, co-chaired by the U.S. National Science Foundation (NSF) and the Japan Ministry of Education, Culture, Sports, Science and Technology (MEXT), Profs. Tsuneo Ono and Hiroya Sugisaki of the Japan Fisheries Research Agency (FRA) organized a workshop on collaborative studies for ecosystem variation and climate change in the North Pacific. Invited to this workshop were representatives from eastern North Pacific ocean observing programs. The workshop took place from the 21st to the 23rd October 2006 in Yokohama, Japan after the PICES XV annual meeting.

The meeting started with a set of talks reviewing the status of different ocean observing programs off Japan (A-Line program and ODATE Project) and the West Coast of North America (CalCOFI Program, Newport Line). After these presentations the workshop split into groups to discuss commonalities of existing ocean observing programs in the eastern and western North Pacific in the areas of biogeochemistry and ecosystem structure. All of the described ocean observing programs suffered in the past from inconsistent sampling schedules. Sampling schedules and locations have become more routine and regularized in recent times; however, funding continues to threaten most of these programs.

The objective of the four working groups was to identify common phenomena and forcing functions that programs on either side of the North Pacific have observed or are studying.

Discussions revealed significant differences between the systems on the eastern and western side of the North Pacific. In terms of hydrography and bottom up forcing, the two systems differ dramatically. The western system is dominated by two strong currents, the Kuroshio and the Oyashio. The Kuroshio carries warm and nutrient deplete waters along the coast of Japan north. The Oyashio carries cold nutrient replete waters south. Both converge off Japan and flow east. As a consequence spatial gradients of hydrographic and biological properties are highly compressed – the system can be compared to a large-scale frontal system. Productivity in this system is dominated by nutrients carried by the Oyashio current. In contrast, the California Current System (CCS) is dominated by the cold and fresh CC flowing south. Nutrients in the current are depleted, but the system's productivity is maintained by coastal upwelling and possibly oceanic upwelling south of Point Conception. North-south gradients of physical and biological properties are spread out over much longer distances. Thus, a valid comparison of the two ecosystems must include on the eastern side of the North Pacific the area ranging from British Columbia to Baja California, whereas on the western side the area covered by the A-line program might suffice. The two systems are similar in providing the habitats for populations of small pelagic fish (sardines and anchovies). In both systems the reproductive portion of these fish life histories depends on subtropical waters with similar reproductive timing in both systems. However, the rest of the life history of the two populations differs significantly; populations on the western side of the basin range into far colder environments compared to the eastern basin. Understanding the forces that control the distribution and abundance of these populations in the two systems may well provide us greater insight into the role that these populations have in their respective ecosystems.

Comparing these populations of small pelagic fish from an ecological and physiological perspective was thought to be the first step required for a comparison of the two systems. Euphausiids were also identified as an important group of species that may play a key role in either system. A comparison of the hydrography and lower trophic levels would have to be carried out from the perspective of the small pelagic fish. The importance was stressed, to not only compare time series but also mechanisms that drive changes of the two systems over time.

Possible topics for future data comparative study:

- Comparison of anchovy and sardine spawning habitats and distributions
- Hydrography and lower trophic level dynamics of spawning habitats and feeding grounds
- The role of iron in controlling productivity in the two systems
- Effects of basin-scale forcing on the two systems

Collaborations between the ocean observing programs on the eastern and western side of the North Pacific basin will continue over the next year. Identified avenues and opportunities:
1. Funds available to the CCE-LTER program to send one scientist to Japan for a two-week period for data analysis and synthesis.
2. Workshops in the context of North Pacific Marine Science Organization PICES (http://www.pices.int) annual meetings (26Oct- 4Nov 2007, Victoria, Canada) to further develop the themes discussed during this workshop.
3. A workshop on selected specific topics to be hosted by the CCE-LTER group.