Overview of WG 23: Comparative ecology of krill in coastal and oceanic waters around the Pacific Rim

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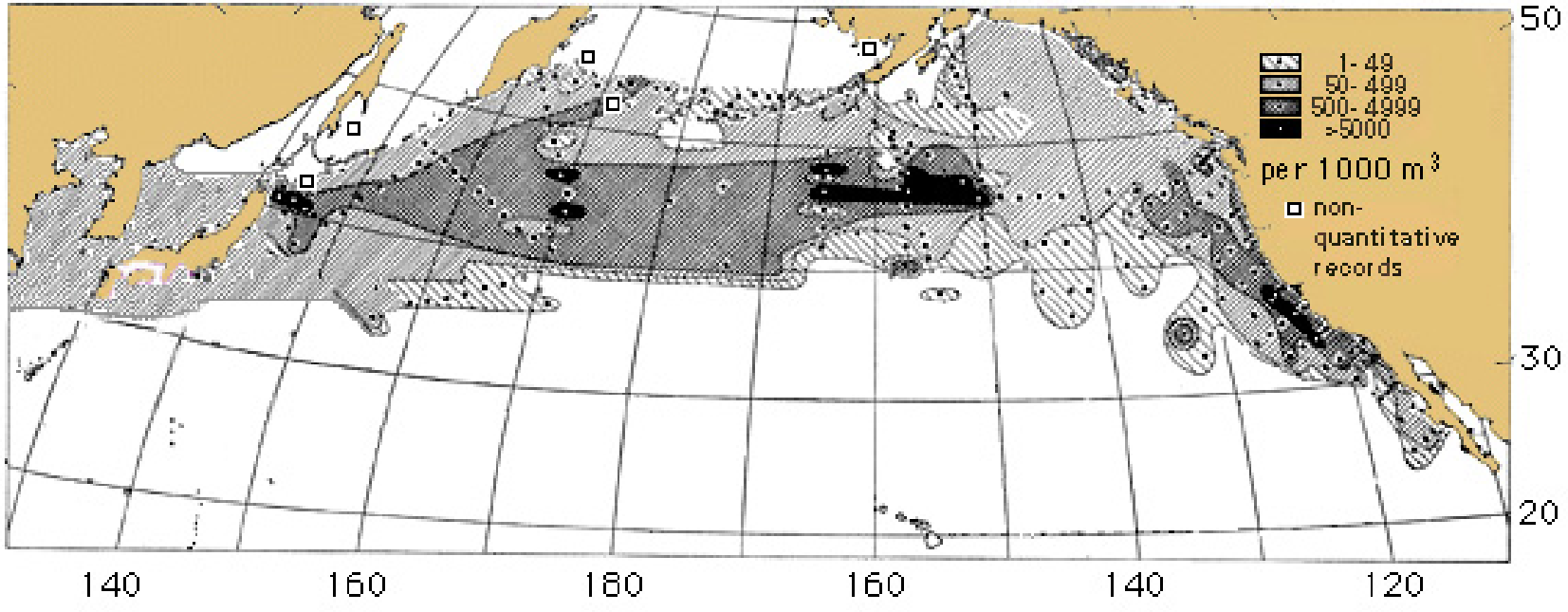
WG-23:
Comparative ecology of krill in coastal and oceanic waters around the Pacific Rim

- Parent Committee: BIO
- Duration: 3 years
- Began: Oct 2008 (Dahlian)
- End: Oct 2011 (Russia)
- Members: two from each PICES nation

Euphausia pacifica



- Distributed around Pacific Rim and across open ocean
- Occupies a broad variety of habitats from cold subarctic waters to warm subtropical waters.
- A key species in food chains as grazer and prey for commercially-important fishes, as well as many birds and mammals.
- PICES WG 23 asks "What are the unique characteristics of the life history of this cosmopolitan species that allow it to populate and dominate a wide variety of ecosystems?"
- How might climate change affect distribution, population dynamics and production of this species in different regions of the Pacific?

History

- W. Peterson suggested at PICES-13 in Honolulu that PICES sponsor "International year of the euphausiid" study: Comparative life history of euphausiids in continental shelf and slope waters around the Pacific Rim.
- PICES-14 Vladivostok, presented "Protocols for Measuring Molting Rate and Egg Production of Live Euphausiids
- PICES-15 Yokohama (2006), BIO approved formation of Working Group;
- In 2006, published to the PICES website ("Projects") "Protocols for Measuring Molting Rate and Egg Production of Live Euphausiids
- PICES-16 Victoria, TOR accepted
- Convened a large workshop (100+ people) at the Hiroshima Zooplankton meeting (June 2007)
- PICES-17 Dahlian, 2008, first formal WG meeting

Terms Of Reference

- Generate lists of metadata/data available in each Nation so as to facilitate comparative studies
- Discuss ways/means of exchanging scientists
- Initiate research programs in each PICES nation
- Convene practical workshopsto train students and technicians
- Modeling – incorporate krill into the Nemuro model
- Convene Krill and Krill-related Workshops/Symposia at PICES and other International/National meetings

Activities of the WG 23

- Meet during PICES Annual Meetings (Dahlian, JeJu, Portland, Russia) in a workshop format
- Convened workshop at GLOBEC OSM-3, Victoria, June 2009, "Krill biology and ecology in the world's oceans" Bill Peterson (USA), Angus Atkinson (UK), Jaime Gomez (MS) and Bettina Meyer (Germany).
- Convened workshop at Sendai Meeting (April 2010), "Examining the linkages between physics and fish: How do zooplankton and krill data sets improve our understanding of the impacts of climate change on fisheries?", Bill Peterson (USA) and Kazuaki Tadokoro (Japan)

Activities (continued)

- Generated a list of publications as well as grey literature, working now to produce a library of pdf copies of as many krill publications as possible from around the Pacific Rim.
- Generated listing of data/metadata availability
- Generated lists of oceanographic/krill time series
- Collaborative Papers with other krill scientists. Feinberg et al. (in prep) is a review of brood size and interbrood period for female *Euphausia pacifica* in waters of the California Current (Oregon, L. Feinberg, T. Shaw and W. Peterson; Southern California.CalCOFI, M. Decima), off Japan (with Y. Okazaki) and in the Yellow Sea, (S. Song, China).
- Publish article in PICES Press on results of workshops and on other key WG activities.

Activities (continued)

- Exchange of scientists: Ph.D. student from Qingdao working in Peterson lab in Oregon (Xiuning Du) on krill feeding rates
- Exchange of scientists: Peterson and Shaw to participate in research cruise with Korean krill scientists in April 2010 but the incident with the Korean Navy ship caused this to be cancelled.
- Peterson and Shaw visited labs in Shiogama and FRA/Yokohama to see research facilities and the Odate collection
- Exchange of scientists: Peterson hosting a Chilean krill researcher (Ramiro Riquelme, Univ. of Concepcion) summer/fall 2010.

FUTURE and Climate Change: how does one study climate change?

- Modeling using Global Climate Models, ROMS and coupled ROMS-Ecosystem models
- Trends in physical and biological variables measured in long-term observations programs
- Experiments on response of organisms to decreased pH (ocean acidification) and decreased oxygen (hypoxia)

COVE and WG 23

- The COVE Key Questions:
  - (1) What determines an ecosystem's intrinsic resilience and vulnerability to natural and anthropogenic forcing?
  - (2) How do ecosystems respond to natural and anthropogenic forcing, and how might they change in the future?
- WG-23 ends in 2011 but PICES scientists are well-prepared to contribute data on:
  - How might climate change affect distribution, population dynamics and production of this species in different regions of the Pacific?
  - Modeling: Krill in models is well developed
  - Trends: trends in krill egg, larval or adult abundance from long term monitoring of krill eggs, larvae and adults
  - Response: Effects of reduced pH and Oxygen on development, growth and survival of krill eggs, larvae and adults

SOFE and WG-23

- The Advisory Panel on ***S**tatus, **O**utlooks, **F**orecasts, and **E**ngagement* (SOFE) is focused on identifying major sources of uncertainty and impediments to improving the skill of assessments and forecasts, suggesting research areas for priority development, and providing coordination of potential PICES products.
- SOFE will provide for a PICES final peer review on information and interpretations, and work on how to engage potential users of North Pacific ecosystem and climate information, including the quality of information and uncertainty.
- KRILL A key species in food chains as grazer and prey for commercially-important fishes, as well as many birds and mammals, thus krill are a major part of pelagic ecosystems around the Pacific Rim. Work on krill should be part of SOFE.