

PICES/NPFC collaborative research: The influence of environmental changes on the potential for species distributional shifts and population dynamics of Pacific saury

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Background

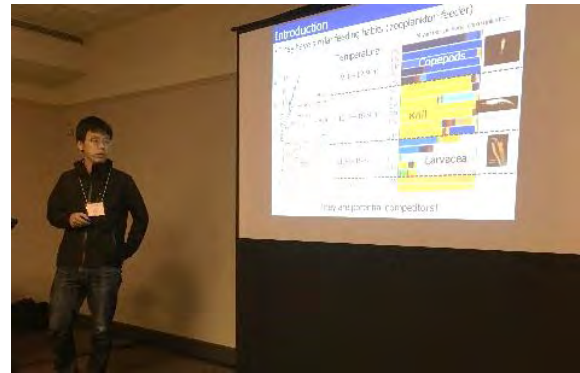
The North Pacific Fisheries Commission (NPFC) is a regional fisheries management organization with responsibility for managing high seas fisheries in the PICES region. In 2017 PICES and the NPFC formed a joint Study Group for [Scientific Cooperation in the North Pacific Ocean](#). The purpose of this Study Group was to promote collaboration between the two organizations towards a greater understanding of the pelagic ecosystem and its variability and the resulting impacts on fisheries production.

The joint PICES/NPFC workshop (W11) on the influence of the environment on Pacific saury, held at PICES-2019 on October 16, was the inaugural-sponsored activity of this collaboration between the two organizations. The objectives of the workshop were to examine environmental conditions and spatio-temporal changes in Pacific saury distribution, determine how these affected the habitat of Pacific saury, and explore what the implications of climate variability might be for Pacific saury populations dynamics.

Workshop contents

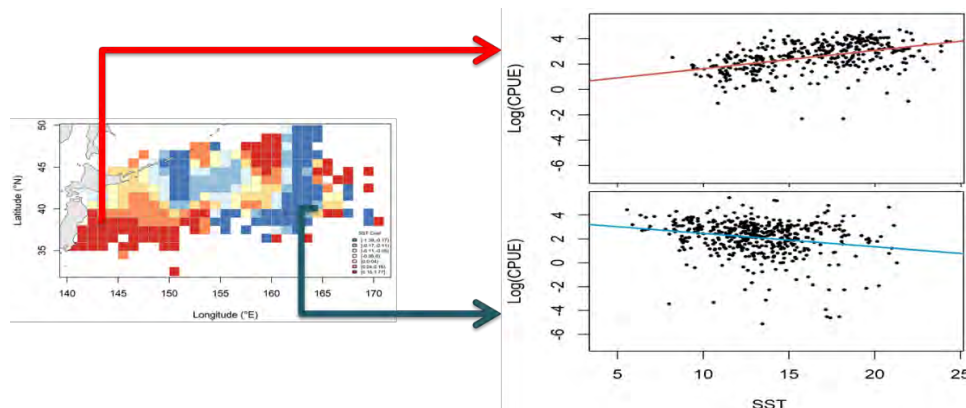
The workshop began with an introductory presentation by Dr. Kazuhiro Oshima that outlined the cyclical pattern in Pacific saury biomass estimated through the stock assessment by the NPFC. A key uncertainty is the level to which productivity, growth and survival might be influenced by changes in available habitat and ecosystem productivity. Next, Dr. Chuanxiang Hua presented analyses that examined relationships between Pacific saury fishery effort and sea surface temperature (SST) and its gradient (SSTG). A key finding was that SST appears to control the migration and

distribution of Pacific saury, whereas SSTG appears to be related to the aggregation of Pacific saury. Dr. Taiki Fuji talked about how the presence of competitors for prey species (particularly Japanese sardine) impacted the distribution of Pacific saury. The discussion that followed centered around uncertainties in the relationships between the oceanography and Pacific saury distribution, the types of variables (both oceanographic and biological) that are important for determining the abundance of Pacific saury, and in particular, the need for more study of the mechanisms underlying the environmental relationships.



Dr. Taiki Fuji presents information on the feeding habits of Pacific saury and their competitors in the pelagic waters of the NW Pacific Ocean.

The second topic for presentations at the workshop was an examination of modeling the distribution and environmental relationships of Pacific saury. Dr. Bai Li found evidence for non-stationarity in the relationships between environmental factors and catch-per-unit-of-effort (CPUE) of NPFC member fishing fleets, meaning the CPUE was responding differently to environmental covariates in different regions.



Evidence for spatial non-stationarity in the relationship between sea surface temperature (SST) and catch-per-unit-of-effort (CPUE) for Pacific saury in the NW Pacific Ocean presented by Dr. Bai Li representing the North Pacific Fisheries Commission.