

Report of the NPAFC–PICES Study Group on *Scientific Cooperation in the North Pacific Ocean*

The Joint NPAFC–PICES Study Group on *Scientific Cooperation in the North Pacific Ocean* (SG-SC-NP) was endorsed by PICES Science Board at the May 2013 Inter-sessional Science Board Meeting in St. Petersburg, Russia, and was subsequently unanimously approved by PICES Member Countries. The SG-SC-NP was also endorsed by the NPAFC Committee on Scientific Research and Statistics (CSRS) at their April 2013 meeting in Honolulu. NPAFC (North Pacific Anadromous Fish Commission) is an international inter-governmental organization established to promote the conservation of anadromous stocks primarily in international waters of the North Pacific Ocean and its adjacent seas. The purpose of the Study Group is to develop a framework of enhanced collaboration between the two organizations to achieve better and/or more rapid understanding of natural and anthropogenic variability in marine ecosystems. The Study Group will review each organization's scientific needs and identify where similar key questions or scientific issues might be explored jointly by both organizations. Chairing the Study Group are Libby Logerwell (PICES, FIS Committee Chair) and Jim Irvine (NPAFC, Stock Assessment Working Group Chair, Science Sub-Committee). PICES members are: Thomas Therriault (Chairman-elect, Science Board), Skip McKinnell (PICES Secretariat), and Hiroaki Saito (FUTURE/COVE Advisory Panel Chair). NPAFC members are: Shigehiko Urawa (Science Sub-Com Chair), Alex Zavolokin (Science Sub-Committee), and Nancy Davis (NPAFC Secretariat) (*SG-SC-NP Endnote 1*).

SG-SC-NP met on October 16 during the PICES 2013 Annual Meeting in Nanaimo, Canada, under the chairmanship of Dr. James Irvine. Brief overviews of PICES and NPAFC organizational structures and scientific missions were given (*SG-SC-NP Endnote 2*).

AGENDA ITEMS 2 and 4b

Proposal for topic session at PICES-2014

An SG-SC-NP Topic Session titled “*Towards improved understanding of linkages between Pacific salmon and their marine ecosystems*” and co-sponsored with FIS was submitted to FIS for approval for PICES-2014 in Yeosu, Korea. FIS approved the topic but recommended it as a workshop (*SG-SC-NP Endnote 3*). The goal of this workshop will be to focus on one (or more) questions(s) of mutual interest, such as: Where do Asian chum salmon spend their winters and why; and how is it likely to be affected by climate change? A publication may result from the workshop.

AGENDA ITEMS 3

Scientific needs and overlapping issues

Scientific needs and overlapping issues that might be explored jointly by both organizations were discussed. Possible questions of mutual interest are: Where do salmon go in the winter and why; and how might this be affected by climate change? How can we improve our ability to forecast salmon production? What determines salmon carrying capacity and how might this be affected by climate change?

AGENDA ITEM 5

Next steps to complete framework report

The outcome of the SG-SC-NP will be a report describing a framework for scientific cooperation between the two organizations, to be completed in the spring of 2014. Next steps towards this report are to define and refine key questions of mutual interest and to describe implementation procedures. This work will be conducted by email among Study Group members and led by the Co-Chairs.

SG-SC-NP Endnote 1

SG-SC-NP participation list

Members

Thomas Therriault (PICES/Canada)
Skip McKinnell (PICES/Secretariat)
Hiroaki Saito (PICES/Japan)
Shigehiko Urawa (NPAFC/Japan)
Nancy D. Davis (NPAFC/Secretariat)
James R. Irvine (NPAFC/Canada, Chairman)

Observers

Vladimir Radchenko (NPAFC)

SG-SC-NP Endnote 2

SG-SC-NP meeting agenda

1. Briefly review SG purpose which is: by spring 2014, to develop a framework of enhanced collaboration between the two organizations to achieve better and/or more rapid understanding of natural and anthropogenic variability in marine ecosystems.
2. Briefly review proposal for topic session at PICES-2014 (e.g. invited speakers, publication).
3. Review scientific needs and overlapping issues that might be explored jointly by both organizations including, but not limited to, the following:
 - a. Where do salmon go in the winter and why and how might this be affected by climate change?
 - b. Are episodic injections of iron and other nutrients to the surface ocean responsible for occasional returns of high abundances of sockeye salmon and pink salmon?
 - c. How to improve our ability to forecast salmon production? Role of density-independent (hard-to-predict, low frequency, high impact) and density dependent events.
 - d. What determines salmon carrying capacity and how might this be affected by climate change?
4. Review approaches to deal with these overlapping issues. For example:
 - a. Joint (modelling?) working group with regular meetings
 - b. Joint symposia/topic sessions
 - c. Joint surveys
 - d. Collaborative publications
 - e. Roles and responsibilities of individual SG members
5. Next steps to complete framework report by spring 2014
6. Other items

SG-SC-NP Endnote 3

**Proposal for a 1-day FIS Topic Session [later changed to a Workshop] on “Towards improved understanding of linkages between Pacific salmon and their marine ecosystems”
(co-sponsored by NPAFC) at PICES-2014**

Pacific salmon (genus *Oncorhynchus*) are an important ecological and economic species complex widely distributed throughout the North Pacific Ocean. In recent years, there have been large, often unanticipated, fluctuations in abundance and survival that may be climate-change related. Understanding the causes of variable salmon production will be critical to predicting future abundance levels and harvest opportunities. This has been a major concern for the North Pacific Anadromous Fish Commission (NPAFC), which has responsibility for scientific research and enforcement for conserving anadromous salmon and steelhead trout in the North Pacific Ocean.

This workshop is intended to build on recommendations from a report prepared by the NPAFC/PICES Study Group in the spring of 2014. The workshop will bring together researchers in fisheries and oceanography to

improve understanding of the mechanistic linkages between salmon and their ecosystem. Of the many topics of overlapping interest between the two organizations, it is envisaged that this workshop will focus on one question: *Where do Asian chum salmon go in the winter and why, and how might this be affected by climate change?* Prior to the workshop, salmon researchers will assemble information on where chum salmon are thought to live during the winter including depth, temperature and salinity. Oceanographers and climate specialists will be provided these data prior to the workshop so that they can do preliminary work on the extent of the habitats suitable for chum salmon, both currently and subsequently based on various scenarios of climate change.