PICES-ISC collaboration: Purposes, Structure, Science Program, and Expert Groups of PICES

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Purposes:

• to promote and coordinate marine scientific research in order to advance scientific knowledge of the area concerned and of its living resources, including ..., and impacts upon it from human activities; and

• to promote the collection and exchange of information and data related to marine scientific research in the area concerned.
The PICES has a role to advance scientific knowledge on the North Pacific Ocean, along with its marginal seas, and to make predictions that will improve human conditions and bring benefits to the Contracting Parties. Such a goal can only be achieved by multi-national scientific cooperation. PICES synthesizes and disseminates knowledge and designs multi-national research programs that respond to identified needs.

- PICES Strategic Plan
AICE (Anthropogenic Influences on Coastal Ecosystems)
COVE (Climate and Oceanographic Variability and Ecosystems)
SOFE (Status, Outlook, Forecast and Engagement)
• Two Science Programs
  – CCCC(Climate Change and Carrying Capacity, 1994-2008)

  – FUTURE(Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems, 2009-)
Goals:

- To provide a strategy for determining the carrying capacity for higher trophics in the subarctic North Pacific (Salmon, Pollock, birds, mammals, etc.); and

- To develop a plan for a cooperative study of how changes in ocean conditions affect the productivity of key fish species in the subarctic North Pacific and coastal zones of the Pacific rim.
The 2nd Integrative Scientific Program of PICES

FUTURE

Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems

• 2003-2006 initial planning & discussion
• 2007-2008 writing-up of Science Plan
• 2008-2009 writing-up of Implementation Plan
• 2009-2019 Implementation
Objectives in Developing FUTURE

• Build upon the successful CCCC program
• From climate variability to global change
• From the open ocean to the coast, and explicitly include the inter-relationship of marine ecosystem and social systems

• Key Elements -- Global change, human dimension, forecasts, ...
Further requirements

Move beyond the previous research program by:
– investigating the *mechanisms* underlying ecosystem response to natural and anthropogenic forcing;
– Improving *forecasting* capabilities and providing estimates of the *uncertainty* associated with these forecasts; and
– developing more effective ways to *convey* knowledge and predictions.
To understand and forecast responses of North Pacific marine ecosystems to climate change and human activities at basin and regional scales, and to broadly communicate this scientific information to members, governments, resource managers, stakeholders and the public.

“What is the future of the North Pacific given current and expected pressures?”
Objective 1 (scientific understanding)
• Answer the three key scientific questions

Objective 2. Status Reports, Outlooks, Forecasts and Engagement
• The production of *Status Reports, Outlooks and Forecasts*.
• **Engagement:**
  – *Establish Dialogs with Recipients of Potential FUTURE Products*
  – *Communicate with clients*
Scientific questions of FUTURE

Objective 1: Understanding Critical Processes in the North Pacific

(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?

(3) How do human activities affect coastal ecosystems and how are societies affected by changes in these ecosystems?
FUTURE Implementation

Advisory Panels to achieve the Objectives

• Objective 1 (scientific understanding)
  – AICE (*Anthropogenic Influences on Coastal Ecosystems*): focusing primarily on human influences on coastal ecosystems
  – COVE (*Climate and Oceanographic Variability and Ecosystems*): focusing on regional to basin scale ecosystem processes and Pacific basin teleconnections.
• Advisory Panel for Objective 2
  – SOFE (*Status, Outlook, Forecast and Engagement*):
    • improving the skill of assessments and forecasts,
    • provide coordination of potential PICES products.
    • provide for a PICES final peer review on information and interpretations,
    • on how to engage potential users of North Pacific ecosystem and climate information, including the quality of information and uncertainty.
Users and Products

- FUTURE Objective 1: Users are scientists
- Objective 2: Users are various segments of human society. The users of the products from FUTURE Objective 2 remain ill-defined.
  - Societal priorities are also on the emerging “hot topic” issues, which demand advice suitable for rapid responses.
  - FUTURE products should address pressing societal needs and goals.
Study Groups

SG-RS: Study Group on Radionuclide Science in the North Pacific Ocean (2013 - 2013)

Study Group has a 1 year life-span usually.
Working Groups

WG-26: Working Group on Jellyfish Blooms around the North Pacific Rim: Causes and Consequences (2010 - 2013)


WG-28: Working Group on Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors (2011 - 2014)


WG-30: Working Group on Assessment of Marine Environmental Quality of Radiation around the North Pacific (2013 - 2016)


Working Group has 3-year life span
Sections

S-HAB: Section on Ecology of Harmful Algal Blooms in the North Pacific (2003 - 2014)

S-CC: Section on Carbon and Climate (2005 - 2013)

S-CCME: Section on Climate Change Effects on Marine Ecosystems (2011-2020)


Section has a longer longevity,
• Climate change will impact on marine organisms in the north Pacific.

• Due to warming of seawater, many species will move toward higher latitude.

• Some tropical and subtropical species such as tuna and tuna-like species would expand their distribution to higher latitude where PICES traditionally has focused in its coordinated research.
PICES FUTURE Structure

Science Board (FUTURE SSC)

PICES Committee

POC  BIO  FIS  MEQ  MONITOR  TCODE

Section  Section  WG  WG  SG  SG  new WG  new WG

FUTURE Advisory Panels

AICE  COVE  SOFE

: FUTURE science  : other PICES science

AICE (Anthropogenic Influences on Coastal Ecosystems)
COVE (Climate and Oceanographic Variability and Ecosystems)
SOFE (Status, Outlook, Forecast and Engagement)
Example of PICES/ICES collaboration: S-CCME/SICCMIE