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

Suam Kim

Pukyong National University

# PICES

## (North Pacific Marine Sciences Organization)

**Purposes:**

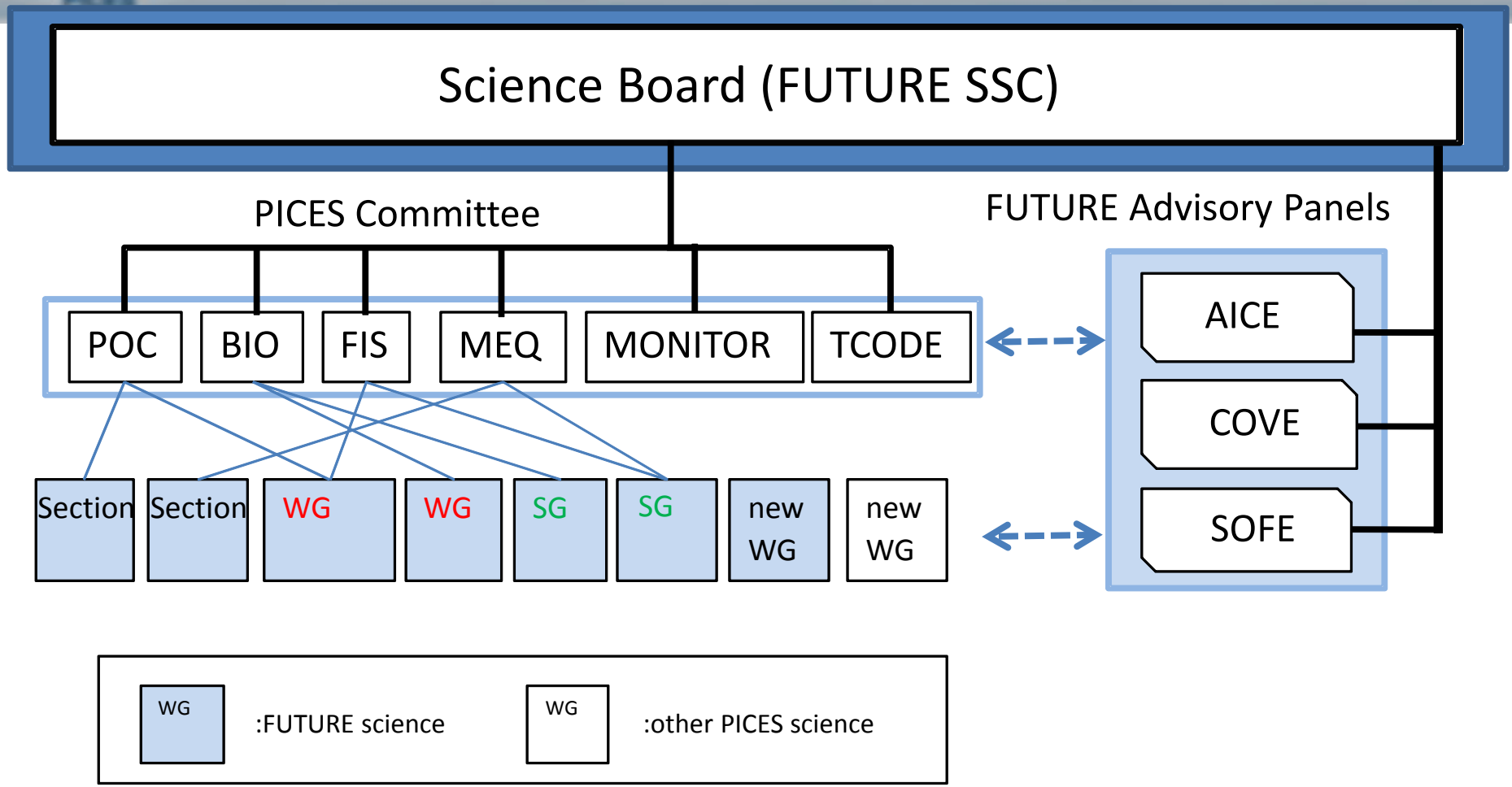
- to promote and coordinate marine scientific research in order to advance scientific knowledge of the area concerned and of its living resources, including …, and impacts upon it from human activities; and
- to promote the collection and exchange of information and data related to marine scientific research in the area concerned.

# Integrative Scientific Program of PICES

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

# PICES FUTURE Structure




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-)**

# Climate Change and Carrying Capacity (CCCC), 1994-2008

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

**F**orecasting and **U**nderstanding **T**rends, **U**ncertainty and **R**esponses of North Pacific Marine **E**cosystems

- 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.

# Theme for FUTURE

*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?"**

# FUTURE Objectives

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 (***A**nthropogenic **I**nfluences on **C**oastal **E**cosystems*): focusing primarily on human influences on coastal ecosystems
  - COVE (***C**limate and **O**ceanographic **V**ariability and **E**cosystems*): 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-MP: Study Group on Marine Pollutants (2011 - 2013)

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

SG-HD: Study Group on Human Dimensions (2009 - 2011)

SG-SEES: Study Group on Socio-Ecological-Environmental Systems (2013-2014)

SG-BC: Study Group on Biodiversity Conservation (2013-2014)

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-27: Working Group on North Pacific Climate Variability and Change (2011 - 2015)

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

WG-29: Working Group on Regional Climate Modeling (2011 - 2015)

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

WG-31: Working Group on Emerging Topics in Marine Pollution (2014 - 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)

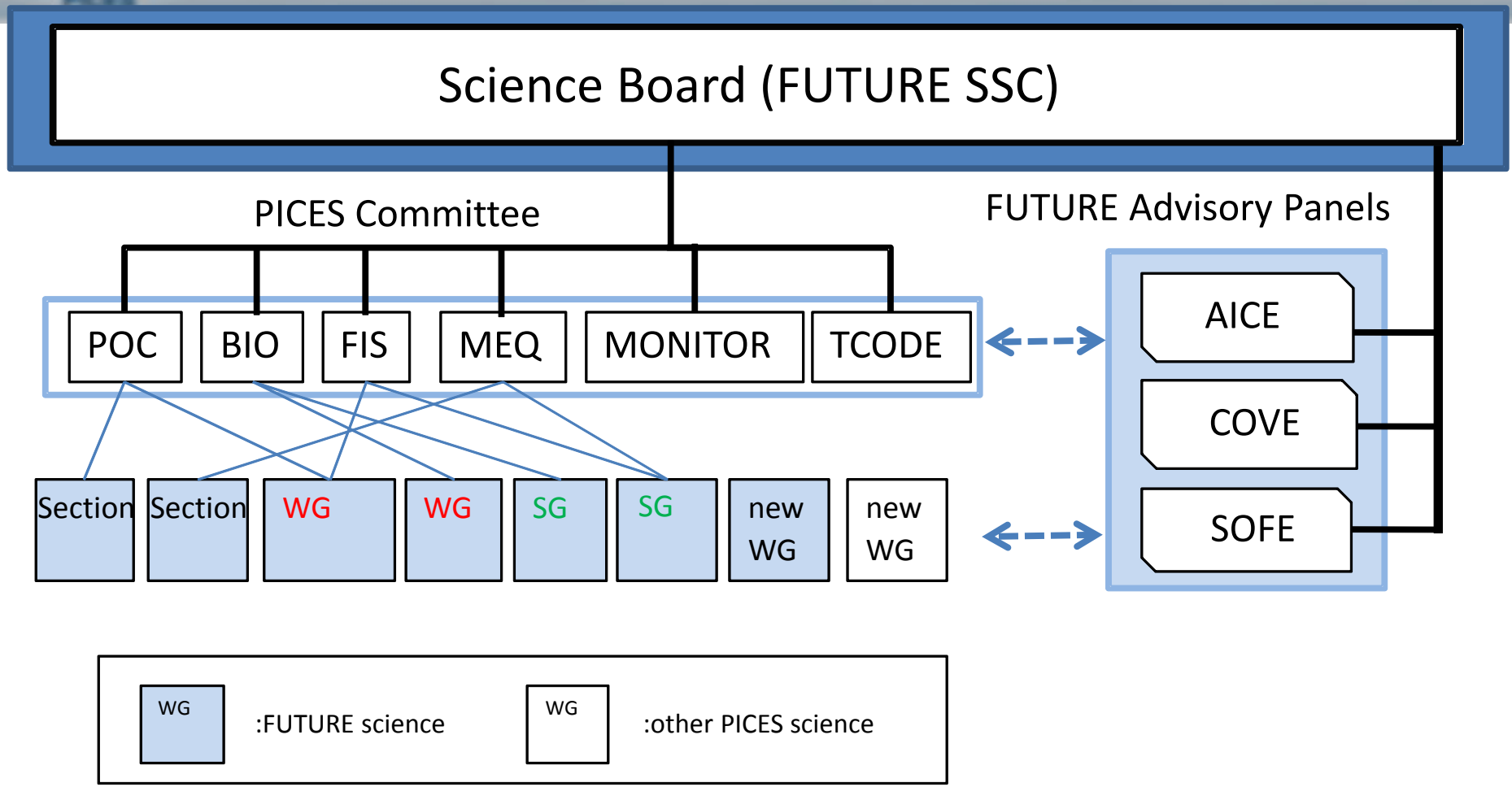
S-CCME: Section on Climate Change Effects on Marine Ecosystems (2011-2020)

S-HD: Section on Human Dimensions of Marine Systems (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




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/SICCME