

# PICES FUTURE

The Advisory Panel on *Climate, Oceanographic Variability and Ecosystems* (COVE)



## Role, Objectives & Products

16 August 2010, Seoul, Korea

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# ToR

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*AICE and COVE APs will recommend priority tasks to PICES SB and relevant Scientific and Technical Committees that establish new PICES expert groups of build on and extend existing activities in PICES*

*Three APs provide continuing direction, leadership, coordination and synthesis within PICES toward attaining the FUTURE goal.*





# FOCI

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Regional (shelf) to basin scale ecosystem processes and Pacific basin teleconnections.

The purview of COVE is mainly the key questions (2) & (1):

*(2) How do ecosystems respond to natural and anthropogenic forcing, and how might they change in the future?*

*(1) What determines an ecosystem's intrinsic resilience and vulnerability to natural and anthropogenic forcing?*



# WORK PLAN FOR THE 1ST TRIENNIUM

- × Review the current and proposed activities of related ExGs to COVE-AP (WG20, 22, 23, CC-S) and evaluate them in terms of FUTURE.  
*October 2010 (PICES 19), ongoing*
- × Work with Committee chairs and ExGs to **identify priority topics and activities** for COVE with consideration on the issues of 1) organisms and processes sensitive to perturbations, 2) intrinsic resiliency of ecosystem to pressure and perturbations.  
*October 2010 (PICES 19), ongoing*
- × Work with Committee chairs **to develop new ExGs** to address the COVE-AP related FUTURE priorities.  
*October 2010 (PICES 19), ongoing*
- × Based on the identified priorities, advice on revising the ToR for the ExGs with the term beyond 2010 (i.e., WG23) as needed. Advice on rebuilding the ToR of CC-S for the next term.  
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# RELATED EXPERT GROUPS OF COVE

Section on *Carbon and Climate* ([CC-S](#))

Working Group on *Evaluation of Climate Change Projections* ([WG-20](#))

Working Group on *Iron Supply and its Impact on Biogeochemistry and Ecosystems in the North Pacific Ocean* ([WG-22](#))

Working Group on *Comparative Ecology of Krill in Continental Shelf and Oceanic Waters around the Pacific Rim* ([WG-23](#))



# WORK PLAN FOR THE 1ST TRIENNIUM (2)

- × Review the progress of work plans and update as needed.  
2011-2012
- × Initiate reviews and synthesis of information to address FUTURE goals.  
2010-2012
- × Review briefly on another ExGs related to AICE and SOFE  
October 2010 (*PICES 19*), ongoing





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# ISSUES TO BE CONSIDERED

Identifying organisms and processes that are sensitive to perturbations such as: long-term trends in physical oceanography and changes in interannual (ENSO) and decadal (e.g., PDO, NPGO) variability; the interaction of natural climate variability and greenhouse gas influences; and regional or short-term events such as storms and tsunamis



## **ISSUES TO BE CONSIDERED (2)**

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Evaluating the intrinsic resiliency of ecosystems to pressures and perturbations, and understanding how ecosystem responses may be amplified or buffered through the influence of seasonal changes in physical (e.g., altered upwelling timing) and chemical conditions (e.g., hypoxia, eutrophication, ocean acidification), food-web dynamics, and other factors.

# WHAT WE KNOW?

# WHAT ARE REMAINING ISSUES?



Progress in Pacific Oceanography during CCCC period

## Natural forcing , natural variabilities:

ENSO, PDO, AO

PACIFIC-INDO dipole, ENSO Modoki, NPGO

Iron hypothesis

Ocean Iron Enrichment exps.

The role of iron in food-web dynamics and BGC

Carrying capacity

Ecosystem regime shift, Fish spp alternation

Trophic cascade

Development of Argo floats

>3300 floats

+Chemical/Biological sensors (T,S,D+O<sub>2</sub>, chl, etc)

Sea glider

OGCM (1-2 degree resolution)

Eddy-resolving model, Full-integrated ecosystem

NPZ-model

model on ER-OGCM, SUPER-IBM on EROGCM



# WHAT WE KNOW?

# WHAT ARE REMAINING ISSUES?



Progress in Pacific Oceanography during CCCC period

## Anthropogenic forcing:

AR3(2001)

Overfishing  
Fisheries management  
targeting single species

AR4(2007)

Scientific consensus that anthropogenic global warming is evident, on-going and accelerating (SST, SSH). Surprise (melting arctic sea ice).  
Ocean acidification

Impact of fisheries on ecosystem structure, productivity & resiliency  
Biodiversity  
Ecosystem approaches to fisheries (EAF)/  
Ecosystem based management (FBM)  
Marine Protected Area (MPA)/Marine Sanctuary  
Sustainability in ecosystem services



# COMMUNICATION

## Science and society:

- Increasing anthropogenic forcing makes the distance between ocean sciences and society closer.
- Scientific forecasting of future earth system (e.g. AR4) influences crucially for economy, policy-making, and human society overall.

Out of ivory tower!

Coupling of natural-social sciences

Communication between scientists and general public

Outreach, education and science literacy

Request of “benefit from science” from society.





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