

REPORT OF THE IMPLEMENTATION PANEL ON THE CCCC PROGRAM

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To take advantage of co-holding the Second GLOBEC Open Science Meeting and the PICES Eleventh Annual Meeting in Qingdao, the CCCC Program Implementation Panel (CCCC-IP) convened a series of joint events with GLOBEC International:

- PICES CCCC - GLOBEC joint session on *ENSO and decadal scale variability in North Pacific ecosystems* (October 18, from 11:00-12:30 hours; Convenor: R. Ian Perry);
- PICES CCCC - GLOBEC joint session on *Coupled biophysical processes, fisheries and climate variability in coastal and oceanic ecosystems of the North Pacific* (October 18, from 13:30-17:30 hours; Co-convenors: Harold P. Batchelder¹ and Makoto Kashiwai);
- Joint meeting of CCCC MODEL Task Team and GLOBEC Focus 3 (Prediction and Modelling) Working Group (October 18, from 18:00-20:00 hours);
- Joint workshop of CCCC MONITOR Task Team and GLOBEC Focus 1 (Retrospective Analysis) Working Group on *Requirements and methods for early detection of ocean changes* (October 19, from 08:30-12:30 hours);
- Joint PICES-GLOBEC Workshop on *Exchange, inventory and archival of GLOBEC data* (October 19, from 08:30-17:30 hours).

The CCCC-IP meeting was not held at PICES XI, as the Panel convened the CCCC Program Integration Workshop on October 20, 2002 (08:30 – 17:30 hours). This Workshop was planned and structured to review the achievements of the past 10 years of the CCCC Program and to discuss a future 5-year workplan for CCCC integration and synthesis.

¹ At the last minute Dr. Batchelder was unable to attend the meeting and Dr. William T. Peterson acted as Session Co-convenor on his behalf.

The Executive Committee (EC) of the CCCC-IP met from 18:30-21:30 on October 20, 2002. The CCCC-IP Co-Chairman, Dr. Makoto Kashiwai, welcomed members and informed them that his Co-Chairman Dr. Harold P. Batchelder could not attend this Annual Meeting and he appreciated Dr. Peterson's offer of helping with the Topic Session, the CCCC-IP Executive Committee meeting, and the CCCC Integration Workshop. The CCCC-IP meeting was called to order and the agenda was adopted as presented.

Review of procedures for Best Presentation Awards and Closing Ceremony (Agenda Item 3)

Dr. Kashiwai reported on the results of discussion on this item at the 1st Science Board meeting. The procedure of nomination for the CCCC Best Presentation Award was decided.

The CCCC-IP/EC nomination for the CCCC Best Presentation Award was Dr. Akinori Takasuka (Graduate School of Agriculture and Life Sciences, University of Tokyo, Japan) for his paper entitled "Is a slower growing larval Japanese anchovy actually removed by predation at a given moment in the sea?" (presented at the BIO/FIS/CCCC Topic Session).

Discussion of PICES Review Committee and Science Board Review Reports (Agenda item 6)

Suggested discussion points were prepared by Dr. Kashiwai and circulated with a draft agenda by e-mail before the meeting. Dr. Kashiwai led a discussion of those points. The Panel agreed that the following suggestions needed to be brought forward to the Science Board for further consideration:

- Marine birds and mammals should be included in the scientific scope of PICES,

and specifically should be considered within the scope of the BIO Committee.

- Re-election of Co-Chairmen of the PICES Scientific Program and its sub-structures should be guided by the need to obtain the best scientific leadership and coordination, and not by rigid rule of Co-Chairman tenure.
- Creation of a Vice-Chairman position should be considered to assist the Science Board Chairman in scientific coordination and to provide needed back-up in this important position.
- There is no need to change the position titles within the PICES Secretariat, especially if the scientific coordination function can be strengthened by the creation of a Vice-Chairman position.
- In the PICES budget allocation, the highest priority should be given to creative activities for scientific products, such as practical workshops. The possibility of a bi-annual scientific conference and a bi-annual budget should be considered as a strategy to support increased scientific activities.

Proposals and recommendations on Workplan from the CCCC Integration Workshop (Agenda Item 7)

The CCCC Integration Workshop was held on October 20, 2002, in Qingdao, just after the Second Open Science Meeting of GLOBEC International, and just prior to the Eleventh Annual Meeting of PICES. The Workshop discussed integration of CCCC work that has been conducted by the various Task Teams and developed the following plan:

1. To integrate research activities of the Task Teams toward the following selected topics:
 - Comparison of coastal ecosystems around the North Pacific Rim (and North Atlantic), using zooplankton and small fish as focal species;
 - Latitudinal comparison of North Pacific ecosystems, using multiple focal species;
 - Link basin-scale ecosystem models to coastal ecosystem models in the North Pacific, using salmon and associated

species linked trophically to salmon as focal species.

2. To connect the CCCC Program to past and future ecosystem changes in the North Pacific, MONITOR Task Team will focus its integration activities on two main goals:
 - Improving “timely” detection of changes in ocean ecosystems;
 - Communicating information on changes in the North Pacific ecosystem via “Ecosystem Status Reports” both inside and outside the PICES community.
3. To establish an *ad hoc* NEMURO Experiment Planning Team (NEXT), which will evaluate and consider possible scientific directions, hypotheses and experiments that may be examined using the NEMURO model developed by the PICES-CCCC Program. NEXT will develop an outline (strategy) for a series of model experiments that will examine scientifically important and addressable issues in the North Pacific. Work of NEXT will be conducted in virtual meetings (through e-mail communication and teleconference calls).
4. To hold intensive practical workshops that will conduct specific experiments (simulations) using the NEMURO model or its successors to test specific scientific hypotheses.
5. To consider the possibility of combining REX and BASS Task Teams, based on the strategy of experiments designed by the *ad hoc* Experiment Planning Team.
6. To convene in 2005 or 2006, a large 3-day international scientific conference (like the Beyond El Niño conference held in March 2000), having one or several key CCCC scientific questions as session topics. This will provide a high-visibility forum for the presentation and discussion of synthesized and integrated results of the first 10 years of research in the North Pacific following the framework suggested by the PICES-CCCC Program.
7. To establish a CCCC mailing list to provide broad and direct communication with interested PICES scientists.
8. To communicate and collaborate with related international organizations and

programs for inter-ocean and global comparative studies and for global integration/synthesis.

Inter-sessional meetings proposed for 2003 and beyond (Agenda Item 8)

Proposal from MODEL Task Team

Title: Workshop to *Embed NEMURO and NEMURO.FISH into a 3-D circulation model*

Date/Location: 3 days in March 2003, at Frontier Research System for Global Change, Yokohama, Japan

Conveners: Michio J. Kishi (Japan), Bernard A. Megrey and Francisco E. Werner (U.S.A.)

Objectives: In the past year, significant progress has been made on developing NEMURO, the PICES lower trophic level marine ecosystem model. This has mainly been a result of two highly focused international workshops held in January 2000 (Nemuro, Japan) and 2002 (Nemuro/Yokohama, Japan). Interest in the model from other CCCC Task Teams is growing and collaborative projects between MODEL, BASS and REX have been successful. To date, implementation of NEMURO has been primarily in 0-D or 1-D, and mostly used to explore seasonal variability in the eastern and western subarctic gyres. Now there is a need to couple basin-scale models with coastal system models. 3-D circulation models may provide this capability. For these cooperative endeavors to continue to be successful, extending NEMURO to include a circulation model is required. The MODEL Task Team would like to convene a small workshop (8-10 people) to implement a 3-D circulation model with the NEMURO biological model embedded within. The participants would consist of a core group of individuals who have been the driving force behind the design and implementation of NEMURO.

Publication plan: Draft of the paper may (and perhaps should) appear in some form in the PICES Scientific Report Series, but the target is publication in primary journals.

Travel support request: Funding for 1 person to attend.

Proposal from REX Task Team

Title: *The climate shifts of 1977, 1989 and 1998: Differential physical forcing and ecosystem response in the PICES region*

Date/Location: As inter-sessional Symposium or Topic Session at a future Annual Meeting

Convenors: REX Task Team Co-Chairmen

Objectives: Three climate shifts have been observed in the North Pacific Ocean during the past 25 years: in 1977, 1989 and 1998. The physical forcing and biological response for these shifts appears to be different in the eastern and western sides of the Pacific. In this Symposium, we ask the following questions: “*What do these differences tell us about physical forcing and biological response and what are the mechanisms that lead to these differences? Is species diversity different in the eastern and western Pacific? Do changes in dominance of species affect ecosystem structure? What is the relative importance of basin-scale forcing vs. local scale forcing on changes in ecosystem structure? Do differences in diversity at the beginning of a climate shift influence changes in community structure? (e.g., it was noted that the 1998 shift may have started with a different mix of species than 1989 or 1977)*”.

Publication plan: Publish the proceedings of the proposed Symposium/Session in a refereed journal, following the same format and rules as from the “*Beyond El Niño*” volume, within 1.5 years of the meeting and using *Progress in Oceanography* if possible.

Proposal from BASS Task Team

Title: Workshop to *Examine linkages between open and coastal systems*

Date/Location: 1-day immediately prior to PICES XII (2003), in Seoul, Republic of Korea

Convenors: Vladimir Belyaev (Russia), Gordon A. McFarlane (Canada) and Akihiko Yatsu (Japan)

Objectives: This meeting will examine the oceanographic and biological linkages between open ocean and coastal systems in the North Pacific Ocean. Papers will be prepared by “teams” of investigators to review existing information on linkages for various physical and biological components. Suggested papers would include reviews of physical oceanography,

phytoplankton, zooplankton, migratory pelagics, mesopelagics, marine birds and mammals. In addition there will be an open session for contributed papers.

Publication plan: TBD

Proposal from BASS Task Team

Title: Joint PICES/NPAFC Workshop on *Open ocean and coastal systems*

Date/Location: 2 days immediately prior to PICES XIII (2004), in Honolulu, U.S.A.

Convenors: Richard J. Beamish (Canada, PICES), Yukimasa Ishida (Japan, PICES) and TBA (NPAFC)

Objectives: The workshop is intended to examine and develop approaches for linking open ocean and coastal systems. A focus of the workshop would be on the role of salmon and associated species in linking these systems. Development of the workshop objectives and key questions to be addressed will occur during early 2003, and final organization will occur at NPAFC and PICES Annual Meetings in 2003.

Publication plan: TBD

Proposal from MONITOR Task Team

Title: Workshop to *Assemble and critique a North Pacific Ecosystem Status Report*

Date/Location: 3 days immediately prior to PICES XII (2003), in Seoul, Republic of Korea

Convenors: Vyacheslav B. Lobanov (Russia), David L. Mackas (Canada), Phillip R. Mundy (U.S.A.), Sei-ichi Saitoh (Japan) and William J. Sydeman (U.S.A)

Objectives: Assemble and critique a North Pacific Ecosystem Status Report

Publication plan: PICES web site as pdf file

Travel support request: Funding for a representative from ICES (*e.g.* K. Drinkwater) and a representative from IHDP, and per diem for two extra days for 25 persons.

Proposal from IFEP Advisory Panel

Title: Workshop on *In situ iron enrichment experiments in the eastern and western subarctic Pacific*

Date/Location: December 4-6, 2003, in Sidney, British Columbia, Canada

Convenors: Shigenobu Takeda (Japan) and C.S. Wong (Canada)

Objectives: The proposed workshop will:

- Synthesize the results from two *in situ* iron enrichment experiments performed in the eastern (SEEDS-2001) and western (SERIES) subarctic Pacific;
- Discuss responses in lower and higher trophic levels, carbon cycles, trace-gas production and ocean-atmosphere flux, and models;
- Determine similarity and differences in biogeochemical and ecosystem responses to iron addition between eastern and western Subarctic Pacific;
- Identify specific scientific questions for the longer-term experiment in the western Subarctic Pacific (SEEDS-2004).

Publication plan: The results of the Workshop will be published as a special issue of *Deep Sea Research II*.

Travel support request: Funding for 3 invited speakers

Publications proposed for 2003 and beyond (Agenda Item 9)

The CCCC-IP/EC recommends the following publications:

PICES Scientific Report Series in 2003:

- CCCC Integration Plan (including proceedings of the 2002 CCCC Integration Workshop and summary of following activities);
- Report of the 2002 MONITOR Workshop on *Monitoring from moored and drifting buoys*;
- Report of the joint Workshop of MONITOR Task Team and GLOBEC Focus 1 Working Group on *Requirements and methods for early detection of ocean change*;
- Report of joint meeting of MODEL Task Team and GLOBEC Focus 3 Working Group on *Linking biophysical and upper trophic level models*;
- Report of 2002 BASS/MODEL Workshop on *Using models to test hypothesis on effects of climate change on the North Pacific Subarctic gyre system*.

Special issues of primary journals in 2003:

- The results from *in situ* iron enrichment experiments in the western Subarctic Pacific

(SEEDS-2001) will be published as a special issue of *Progress in Oceanography*.

Membership changes and election of new Chairmen (Agenda Item 10)

The CCCC-IP/EC recommends the following changes in chairmanship for Task Teams:

- BASS: Dr. Akihiko Yatsu (Japan) to replace Dr. Andrei S. Krovnin (Russia) as Co-Chairman; Dr. Gordon A. McFarlane (Canada) to continue for one additional year;
- MODEL: Dr. Shin-ichi Ito (Japan) to replace Dr. Bernard A. Megrey (U.S.A.) as Co-Chairman; Dr. Francisco E. Werner (U.S.A.) to continue as Co-Chairman;
- REX: Dr. William T. Peterson (U.S.A.) to remain as Co-Chairman for one additional year until a suitable replacement is found; Dr. Yoshiro Watanabe (Japan) to continue as Co-Chairman.

High priority projects (Agenda Item 13)

The Executive Committee identified the North Pacific Ecosystem Status Report as a high priority project for CCCC-IP.

Proposed recommendations on other items to be included in the Science Board report to Governing Council (Agenda Item 14)

The CCCC-IP/EC recommends that Science Board design a procedure for the development of either a new PICES Program (to follow the CCCC Program) or a 2nd phase of the CCCC Program.

Proposed future groups (Agenda Item 15)

The CCCC-IP/EC proposes to establish an *ad hoc* Experiment Planning Team, which will work through e-mail communication, to develop scientific strategy, based on requirements of ecosystem models to be developed, for a series of hypotheses testing practical workshops.

Background

The NEMURO lower trophic level (LTL) model was developed by the CCCC PICES MODEL

Task Team in response to the need within CCCC to use models of the marine ecosystem to address the key scientific questions of the CCCC Program.

Recent collaboration and cooperation among MODEL, BASS and REX successfully linked the NEMRUO LTL model to higher trophic levels (HTL). One recent significant development was linking the LTL to the HTL model by including pelagic fishes, specifically Pacific herring and Pacific saury. This model was named NEMURO.FISH. Since the development of these two tools, many suggestions have been brought forward as the next steps for elaborating the model. Some of these include parameterizing to fish species other than herring and saury (*i.e.* salmon), customizing the model to new regional locations (*i.e.* Sea of Okhotsk), the addition of more physical (*i.e.* 3-D circulation) and biological processes (*i.e.* age structure of fishes or size-dependent predation), or the consideration of alternate formulations of key processes already in the model (*i.e.* light limitation on photosynthesis). Unfortunately there is not enough time to consider all these requests even though many are interesting scientifically.

Name of New Group

NEMURO Experimental Planning Team (NEXT)

Terms of Reference

1. To help guide and prioritize requests for modifications, future advancements, extensions, validations, and calibrations of the NEMURO model and its successors;
2. To develop a scientific strategy, based on requirements of ecosystem models to be developed, for a series of workshops for testing hypotheses on the following topics of CCCC Integration:
 - Comparison of coastal ecosystems around the North Pacific Rim (and North Atlantic), using zooplankton and small fish as focal species.
 - Latitudinal comparison of North Pacific ecosystems, using multiple focal species.

- Link basin-scale ecosystem models to coastal ecosystem models in the North Pacific, using salmon and associated species linked trophically to salmon as focal species.
3. To direct the development of advances in NEMURO by considering the scientific importance of the suggestion, the time and resources required to complete the task, and proposed suggestion's relevance to the goals of PICES and the CCCC Program;
 4. To develop an outline of hypotheses-testing model experiments during the early half of 2003 mainly through "virtual meetings" such as e-mail and other forms of long distance communication, and report to CCCC-IP/EC for consideration.

Membership

The team will consist of seven people, a chairman (Harold P. Batchelder was nominated) and 2 members from each of the MODEL, REX, and BASS Task Teams.

Proposed Topic Sessions for PICES XII (Agenda Item 16)

Proposal from MODEL Task Team

Title: 1-day Topic Session on *Comparison of modeling approaches to describe ecological food webs, marine ecosystem processes, and ecosystem response to climate variability*

Conveners: Michio J. Kishi (Japan), Bernard A. Megrey and Francisco E. Werner (U.S.A.)

Objectives: Contemporary modeling efforts have shown remarkable achievements in the application of simulation, conceptual and analytic modeling to biological systems. This is especially true when it comes to modeling the lower trophic levels of marine ecosystems with NPZ type models (biomass-based model), individual based models (IBM's) and population dynamics models. Recent observations and data collections on marine ecosystem primary and secondary producers have provided the opportunity to generate hypotheses to explain the effects of regime shifts and the influence of climate variability. Papers in this session will demonstrate the utility of using modeling and models to examine these and similar hypotheses. Papers dealing with linking regional scale

models to basin scale models, fisheries migration models, models that link lower trophic level models to higher trophic models, ecological food web models, and marine ecosystem process formulations are invited. Topical issues related to future advancements, useful extensions, validations, and calibrations are also solicited.

Travel support request: Funding for 1 invited speaker.

Proposal from REX Task Team

Title: 1-day Topic Session on *Latitudinal differences in response of productivity and recruitment of marine organisms to climate variability, from Subarctic to subtropical waters, in the eastern and western sides of the Pacific*

Conveners: Yoshiro Watanabe (Japan) and others TBD

Objectives: A scientific result of the La Paz symposium on *North Pacific transitional areas* was that distinct latitudinal differences in the magnitude and variability of distribution, productivity and recruitment of plankton and fish stocks were identified. In the session proposed here, we would further explore latitudinal clines in life history strategies at various temporal scales of variability. We would focus on the north-south clines in environmental variability and life history strategies in the eastern Pacific from Mexico to Alaska, and in the western Pacific from China to Russia. We would encourage presentations on scales of physical variability, and clines in productivity and recruitment of plankton, fish, birds, mammals, the benthos and intertidal invertebrates.

Travel support request: Funding for two invited speakers.

Proposal from REX Task Team

Title: A Workshop on *Influence of fishing and/or invasive species on ecosystem structure in coastal regions around the Pacific Rim*

Conveners: REX Co-Chairmen

Objectives: Given that a focus of PICES XII is on Human dimensions of ecosystem variability, we suggest a workshop on the effects of two types of human activities on the structure of coastal ecosystems: fishing and invasive

species. The workshop would be exploratory in scope and ask two questions: (1) *Do we know enough about the influence of fishing or invasive species on ecosystem structure to be able to identify an effect?* and (2) *Can we distinguish the signal from the noise?* This topic might be of interest to POC, FIS or BIO and a description

of this proposal will be given to each Committee Chairman for consideration at their meetings. Should these Committees be interested in collaboration, other convenors would be appointed by them.

Travel support request: Funding for two invited speakers.

CCCC Endnote 1

Participation List

Makoto Kashiwai (CCCC-IP Co-Chairman)
Andrei S. Krovnin (BASS Co-Chairman)
Gordon A. McFarlane (BASS Co-Chairman)
Francisco E. Werner (MODEL Co-Chairman)

Bernard A. Megrey (MODEL Co-Chairman)
William T. Peterson (REX Co-Chairman)
Sei-ichi Saitoh (MONITOR Co-Chairman)
Shigenobu Takeda (IFEP Co-Chairman)

CCCC Endnote 2

CCCC-IP/EC Meeting Agenda

1. Welcome and opening remarks
2. Adoption of agenda
3. Review of procedures for Best Presentation Awards and Closing Session
4. Review of procedures to enhance documentation of PICES scientific sessions
5. Completion of PICES X decisions and recommendations
6. Discussion of PICES Review Committee and Science Board Review Reports
 - a. Suggested discussion points on PICES Review Committee and Science Board Review Reports by M. Kashiwai (see attached)
 - b. Report of discussion at TT meetings
7. Proposals and recommendations on Work Plan from the CCCC Integration Workshop
8. Inter-sessional meetings proposed for 2003 and beyond
9. Proposed publications (PICES Scientific Report series and primary journals) for 2002 and beyond
10. Membership changes and election of new chairmen
11. Tabling of summaries from the PICES XI Topic Sessions
12. Relations with other international programs/organizations
13. High priority projects
14. Proposed recommendations on other items to be included in the Science Board report to Council (*e.g.* recommendations for letters of support to various research efforts)
15. Proposed list of any future groups along with Terms of Reference and a list of potential members
16. Proposed titles for Topic Sessions and Symposia for PICES XII, including draft session descriptions and recommendations for Convenors
17. PICES XII: theme, Science Board Symposium, Topic Sessions and draft schedule
18. Other business

