

REPORT OF THE TECHNICAL COMMITTEE ON MONITORING

3

8

The Technical Committee on Monitoring (hereafter MONITOR) met from 16:00–19:30 hours on October 31, 2007, under the chairmanship of Dr. Jeffrey M. Napp. Seven Committee members were present, and a total of 12 scientists from 5 of the 6 PICES member countries were in attendance (*MONITOR Endnote 1*). The meeting agenda (*MONITOR Endnote 2*) was very full and business was conducted at a brisk pace.

Best Presentation Awards (Agenda Item 2)

MONITOR was assigned responsibility to assess Topic Sessions on “Recent advances in ocean observing systems: Scientific discoveries, technical developments, and data management, analysis and delivery” (S8/S10) and “Operational forecasts of oceans and ecosystems” (S9) by Science Board Chairman, Dr. Kuh Kim. Topic Session S8/S10 oral presentations and posters were reviewed in collaboration with TCODE and Topic Session S9 oral presentations and posters were reviewed in collaboration with POC and CCCC. The Chairman thanked the volunteers in advance for their service.

The MONITOR Best Presentation Award was given to Hiroaki Tatebe (University of Tokyo, Japan) for his paper (co-authored by Ichiro Yasuda and Hiroaki Saito) on “Horizontal transport of *Neocalanus* copepods in the subarctic and northern subtropical North Pacific”. Gitai Yahel (University of Victoria, Canada) won the MONITOR Best Poster Award for his poster (co-authored by Ruthy Yahel, Timor Katz, Boaz Lazar, Barak Herut and Verena Tunnicliffe) on “Fish activity, a major mechanism for nutrient and carbon recycling from coastal marine sediments”.

Status of FUTURE (Agenda Item 3)

Dr. Napp briefed the Committee on the status of the new PICES scientific program, FUTURE

(Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems). Included in the presentation were the next steps in editing, approving, and implementing the Program. Committee members had been asked early in the week to review a draft Science Plan for FUTURE (version 4.2) available on the PICES website, and bring comments to the MONITOR meeting in preparation for the Open Forum that was held on November 1, 2007. A good discussion resulted with many excellent constructive comments. These were distilled and presented by Dr. Napp at the Open Forum (*MONITOR Endnote 3*). The FUTURE Science Plan Writing Team met on November 3 to consider the comments offered during the Open Forum as well as those sent previously by PICES scientists. MONITOR members were encouraged to send suggestions whenever new drafts were released for comment.

North Pacific Ecosystem Status Report (Agenda Item 4)

Dr. Napp informed the Committee on the recent discussion of how to produce future ecosystem status reports. In particular, he reviewed the recommendations of the Study Group on *Ecosystem Status Reporting* (SG-ESR) and the recommendation of the Science Board to incrementally improve and expand the printed version of the report. Current proposals for the report do not address web publishing of seminal time series for the PICES region. Since it is likely that a special Editorial Board will be assembled to guide the writing of the report (not MONITOR), ways to contribute were discussed. The Committee supported a suggestion by the Chairman that MONITOR design and maintain a PICES ecosystem status web page that would feature seminal time series from the PICES region. The site would rely on the cooperation of scientists from member countries to volunteer small sets of existing data from routine

MONITOR-2007

collections, and to annually update them. The next step in the process will be to ask the Science Board to provide comments on this suggestion and tell the Committee if a formal proposal is necessary.

Progress report of the Advisory Panel on Continuous Plankton Recorder Survey in the North Pacific (CPR-AP) and recommendations (Agenda Item 5)

Dr. Sonia D. Batten presented a report of the scientific accomplishments and present status of the North Pacific Continuous Plankton Recorder (CPR) project. The project continues to produce original research as well as important monitoring results. Since its inception in 1997, seven articles from the CPR data have been published in refereed journals and 3 articles on the seabird observations along the CPR lines have been submitted or published. A key area for ecosystem status and monitoring is the observation of changing phenology of planktonic organisms in the North Pacific.

Unfortunately, the funding situation is dire and without assistance the project will likely end after collections early in 2008. In the past, the North Pacific Research Board (NPRB) has funded the east–west transects (including bird and mammal observations), and the Exxon Valdez Oil Spill Trustee Council (EVOSTC) has funded the north–south transects. EVOSTC declined a recent proposal, and NPRB has promised only half of what was formerly granted. A research proposal to the U.S. National Science Foundation (NSF) was pending at the time of PICES XVI. Dr. Charles B. Miller, Chairman of CPR-AP, reported on behalf of the Panel and agreed with Dr. Batten’s assessment of the project (the full CPR-AP report can be found elsewhere in this Annual Report). CPR-AP wholeheartedly endorsed the project as one of the premier monitoring efforts in the PICES region and recommended that MONITOR request that the Science Board approve the concept of a “North Pacific CRP consortium” that could distribute the project costs among a larger group of funding sources, while still allowing each contributor to share the recognition/credit of the scientific achievements.

Furthermore, CPR-AP recommended that a request be made for the Executive Secretary of PICES send a letter asking the principal funding entities of monitoring activities in North America to join the consortium. The Committee discussed and approved the proposal. Drs. Batten and Miller were asked to draft a letter, and Dr. Napp will present it to the Science Board at the end of the week.

NPAFC contributions to the next Ecosystem Status Report (Agenda Item 6)

Dr. James Irvine, Chairman of the NPAFC (North Pacific Anadromous Fish Commission) Working Group on *Stock Assessment*, was invited to give a presentation on the potential contributions by that Commission to the next PICES Ecosystem Status Report. A chapter prepared by NPAFC for the pilot report contained only information about salmon catch in the North Pacific, but the Commission revealed that they would be prepared to provide more data related to the ecology and health of salmon stocks, *e.g.*, information about size-at-age, marine survival, changes in the timing of returns (migration behavior), and oceanic distributions for the various species. In short, data collected under the auspices of NPAFC could be used much more effectively to study the health or status of particular regions of the North Pacific Ocean. The Committee thanked Dr. Irvine for his presentation and discussed various ways that the information could be incorporated into the next report. One way would be to put all the information into a single chapter of the PICES Ecosystem Status Report, but MONITOR favored reporting salmon information in the regional chapters. The Committee recommended involvement NPAFC national representatives of PICES member countries so that the information can be integrated from regional perspectives.

Election of Chairman and Vice-Chairman (Agenda Item 7)

MONITOR held elections for a new Chairman and Vice-Chairman. Dr. Alexander Bychkov, Executive Secretary of PICES, officiated. Dr. Hiroya Sugisaki (Japan) was nominated by

Dr. Sei-Ichi Saitoh and was unanimously elected for a 3-year term as the Chairman of MONITOR. Dr. Philip Mundy was nominated by Dr. Napp and was unanimously elected as the Vice-Chairman of MONITOR. The Committee expressed its gratitude to Drs. Napp and Saitoh, former Chairman and Vice-Chairman of MONITOR, for their leadership and valuable contribution to MONITOR activities over the years. Drs. Napp and Saitoh pledged to help the newly elected officers in their new roles.

Global Ocean Observing System – GOOS (Agenda Item 8)

Dr. Mundy reported that the Study Group *to develop a strategy for GOOS* (SG-GOOS) was in the process of completing their terms of reference (TOR). The final report of the Study Group is included elsewhere in this Annual Report and is also available on the PICES website.

The first TOR asked SG-GOOS to identify and describe the major observing systems (present and proposed) in the PICES region, but this activity was superseded by a comparable effort led by the Intergovernmental Oceanographic Commission (IOC) of UNESCO. Rather than duplicate this effort, SG-GOOS decided to wait until the IOC report is released and then use their information.

The second TOR was to provide a recommendation and justification to MONITOR on whether or not PICES should propose a North Pacific GOOS pilot project to international GOOS (I-GOOS). This issue was discussed within the Study Group and with the GOOS Scientific Steering Committee when Dr. Mundy attended the 10th GOOS SSC meeting in March 2007, in Seoul, Korea. A copy of his presentation to the GOOS SSC is included in the 2007 SG-GOOS report (*SG-GOOS Endnotes 3 and 4*) and also posted on the SG-GOOS web page. The main recommendation of the Study Group is that PICES should focus its efforts on providing a forum for representatives of current and future observing systems where cross-GOOS Regional Alliances, including observing projects, observing technologies, and data and information sharing protocols, could be

developed. MONITOR accepted this recommendation and agreed to forward it to the Science Board. This recommendation, if approved, would require changes in the terms of reference for MONITOR. *MONITOR Endnote 4* provides the current TOR, the changes suggested by SG-GOOS and the subsequent modifications proposed by the Science Board.

SG-GOOS also requested that a representative of MONITOR be sent annually to GOOS SSC meetings to report on North Pacific monitoring activities, emphasizing projects that span observing regions and international boundaries, progress in establishing sensor technologies for scientifically sound observing systems, and progress in the use of common information exchange methods.

Dr. Vyacheslav B. Lobanov attended the 11th Session of the IOC/WESTPAC Coordinating Committee for the North-East Asian Regional Global Ocean Observing System (NEAR-GOOS) in January 2007, in Bangkok, Thailand. His report is included in the 2007 SG-GOOS report (*SG-GOOS Endnote 2*). He also kindly prepared a summary of the meeting results that was presented by Dr. Mundy. A copy of this presentation is posted on the SG-GOOS web page.

Dr. Napp thanked all SG-GOOS members for their service.

Planning for PICES XVII (Agenda Item 9)

MONITOR strongly supported the following two proposals for PICES XVII:

- Dr. Saitoh proposed a 1-day MONITOR workshop on “*Status of marine ecosystems in the sub-Arctic and Arctic seas – Preliminary results of IPY field monitoring in 2007 and 2008*” to be co-sponsored by ESSAS (*MONITOR Endnote 5*).
- Recommended conveners are: Drs. Saitoh (Japan), George Hunt (U.S.A.), Kenneth Drinkwater (Norway) with representatives from China, Korea and Russia to be named.
- Dr. Napp proposed a 1-day MONITOR Topic Session entitled “*Linking biology, chemistry, and physics in our observational systems – present status and FUTURE*”

MONITOR-2007

needs” (MONITOR Endnote 6). The goals of the session are to: 1) define and specify the types, frequency, and spatial resolution of observational data required for our current numerical models; 2) review existing and emerging advanced technologies capable of supplying biomass and species or functional group information; 3) showcase novel data assimilation techniques, formal organization of data or database frameworks that facilitate the operational use of observational data to predict the affects of anthropogenic and climate forcing on the major ecosystems of the North Pacific. There was initial interest by Drs. Napp (U.S.A.) and Young Jae Ro (Korea) to be Convenors from MONITOR. A request was sent to POC, BIO, and TCODE to see if they wanted to co-sponsor the session. TCODE and BIO accepted, and TCODE nominated Hernan Garcia and Allen Macklin (U.S.A.), Toru Suzuki (Japan) and a representative of China to serve as Co-Convenors.

Joint symposia and sessions with ICES (Agenda Item 10)

MONITOR examined the provided list of ICES symposia and scientific sessions. There was interest in co-sponsoring a joint Theme Sessions on “*Coupled physical and biological models*” at the 2008 ICES Annual Science Conference.

PICES Ocean Monitoring Service Award (Agenda Item 11)

The Chairman announced that a new PICES

Ocean Monitoring Service Award (POMA) was established last year to recognize organizations, groups and outstanding individuals that have contributed significantly to the progress of marine science in the North Pacific through long-term ocean monitoring and management of data associated with ocean conditions and marine bio-resources in the region. Nominations will be requested by the Secretariat prior to March 15, 2008. MONITOR and TCODE will recommend a recipient, with final approval by the Science Board at their inter-sessional meeting in April 2008. The first award will be presented at the Opening Session of PICES XVIII in Dalian, China. The Secretariat will design a nomination form for the award.

There was discussion about what entities would be appropriate recipients for the award. For example, if a particular ship had been active in the creation of an important time series would it be the ship or the sponsoring program that should be nominated for the award? Committee members felt that the sponsoring program (university or agency) would be the appropriate recipient.

National reports (Agenda Item 12)

The following Committee members made short presentations on national monitoring activities relevant to PICES:

- Canada: Dr. Mackas
- Japan: Drs. Saitoh and Sugisaki
- Korea: Dr. Ro
- United States: Drs. Barth, Mundy, and Napp

MONITOR Endnote 1

Participation list

Members

Jack Barth (U.S.A.)
David L. Mackas (Canada)
Phillip R. Mundy (U.S.A.)
Jeffrey M. Napp (U.S.A., Chairman)
Young Jae Ro (Korea)
Sei-Ichi Saitoh (Japan, Vice-Chairman)
Hiroya Sugisaki (Japan)

Observers

Sonia D. Batten (Canada)
Alexander Bychkov (PICES Secretariat)
Lyse Godbout (Canada)
Chuanlin Huo (China)
James Irvine (Canada)
Charles B. Miller (U.S.A.)
Thomas C. Royer (U.S.A., TCODE)

MONITOR Endnote 2**MONITOR meeting agenda**

1. Welcome and introductions
2. 2007 MONITOR Best Presentation and Best Poster Awards
3. Status of FUTURE and comments on a draft Science Plan (version 4.2)
4. North Pacific Ecosystem Status Report: SG-ESR and Science Board recommendations
5. Progress report of the Advisory Panel on *Continuous Plankton Recorder Survey in the North Pacific* and recommendations
6. NPAFC presentation and discussion on contribution to the next Ecosystem Status Report
7. Election of Chairman and Vice-Chairman
8. GOOS-related issues
 - a. Report from the Study Group on GOOS
 - b. Recommended changes to the terms of reference for MONITOR
 - c. Report on NEAR-GOOS
9. Planning for PICES XVII
10. Joint symposia and sessions with ICES
11. PICES Ocean Monitoring Service Award
12. National reports of relevant monitor and observation activities

MONITOR Endnote 3**MONITOR Comments on a draft Science Plan for FUTURE (version 4.2)****Forecasting**

- More emphasis on data assimilation; TCODE does not have an explicit role in the present draft.
- More emphasis on real-time dissemination of information from observation networks; Need efficient data QC and analyses, effective alarm and advisory systems for public and business sectors.

Understanding

- Emphasis appears to be on prediction; increase focus on assimilation of data and mechanistic models for better understanding.

Trends

- Increased emphasis on better integration of physical and biological observations. Are GCOOS observations on the correct time and space scales for biological predictions?

- Observation networks often rely on point estimates and gridded data, but important processes and trophic transfer often occur at “hotspots”;
- Seek a balance for observations of mean system state *versus* “events”; Allow for adaptive strategies in observation systems that enhance our understanding by increasing observation frequency and spatial resolution during events;
- Will the observation systems we rely upon today be supported tomorrow (*e.g.*, satellite remote sensing)?

Ecosystems

- How do we measure ecosystem structure?
- Does FUTURE build on existing national and regional research plans (*e.g.*, Gulf of Alaska Ecosystem Monitoring, GOOS, BSIERP)?

MONITOR Endnote 4

Recommended modifications to the MONITOR Terms of Reference

Current terms of reference

- | | |
|--|---|
| <ol style="list-style-type: none">1. Identify principal monitoring needs of the PICES region;2. Develop approaches to meet these needs, including training and capacity building;3. Serve as a forum for coordination and development of the PICES components of the Global Ocean Observing System, GOOS, including possible method development and inter-comparison workshops to facilitate calibration, standardization and harmonization of data sets;4. Serve as the senior editorial board of the North Pacific Ecosystem Status Report (NPESR), reporting to Science Board;5. Recommend interim meetings to address monitoring needs, PICES-GOOS activities, and development of the NPESR;6. Provide Annual Reports to Science Board and the PICES Secretariat on monitoring activities in relation to PICES; | <ol style="list-style-type: none">7. Interact with TCODE on management issues of monitoring data. <p>SG-GOOS recommended replacing TOR 1, 2, 3 and 7 with the following:</p> <ul style="list-style-type: none">▪ Identify principal monitoring needs of the PICES region and approaches to meet these needs by serving as a forum for coordination and development of inter-regional and international components of the North Pacific ocean observing systems, including the Global Ocean Observing System, GOOS, and including facilitation of method development and inter-comparison workshops to facilitate calibration, standardization, and harmonization of data sets;▪ Provide annual reports to the Science Board and the PICES Secretariat on monitoring activities in the PICES areas. |
|--|---|

After discussion at the inter-sessional Science Board meeting in Yokohama, Japan, the proposal was changed to the following:

Modified terms of reference

- | | |
|---|---|
| <ol style="list-style-type: none">1. Identify principal monitoring needs of the PICES region, and develop approaches to meet these needs, including training and capacity building;2. Serve as a forum for coordination and development of inter-regional and international components of the North Pacific Ocean Observing Systems, including the GLOBAL Ocean Observing System, GOOS. Facilitate method development and inter-comparison workshops to promote calibration, standardization and harmonization of data sets;3. Serve as the senior editorial board of the North Pacific Ecosystem Status Report, reporting to Science Board; serve as senior editorial board for PICES web pages on | <p>major monitoring efforts in the North Pacific, including the annual reporting of important time series;</p> <ol style="list-style-type: none">4. Recommend interim meetings to address monitoring needs and PICES-GOOS activities;5. Provide annual reports to Science Board and the Secretariat on monitoring activities in relation to PICES;6. Interact with TCODE on management issues of monitoring data. <p>Note that TOR 3 may be further modified based on the decision of the Science Board on how to proceed with the writing and production of the Ecosystem Status Report.</p> |
|---|---|

MONITOR Endnote 5

**Proposal for a 1-day MONITOR workshop at PICES XVII on
 “Status of marine ecosystems in the sub-Arctic and Arctic seas – Preliminary results of IPY field
 monitoring in 2007 and 2008”**

The sub-Arctic and Arctic seas have distinct marine ecosystems that are affected by seasonal sea ice. During the summer, the water column is stratified by melt water from retreating sea ice, and phytoplankton are found near the sea surface, where the incoming sunlight is sufficient for photosynthesis. These summer conditions result in the highest primary production in the world’s oceans and support high levels of fishery resources. Algae that live on the bottom of sea ice also play an important role in maintaining fishery resources by falling and decomposing on the sea floor in summer. Recently, global climate change has become a cause for concern. The greenhouse effect, produced by increasing anthropogenic CO₂ emissions, has induced increases in atmospheric and seawater temperatures. The effect of such increases on the cryosphere of the Arctic is

already visible, and understanding its direct and indirect effects on the physical and chemical environments and the responses of marine ecosystems is critical. However, the knowledge of most aspects and responses of marine ecosystems to global climate change is still inadequate. PICES nations have conducted several field programs in these regions during the International Polar Year (IPY) 2007–2008. This workshop will discuss the features and mechanisms of the responses of marine ecosystems to global climate change in the Arctic and sub-Arctic seas, based on results from the IPY cruises in 2007 and 2008.

Recommended convenors: Kenneth Drinkwater (Norway), George L. Hunt, Jr. (U.S.A.), Sei-Ichi Saitoh (Japan) and others TBD.

MONITOR Endnote 6

**Proposal for a 1-day MONITOR/TCODE/BIO Topic Session at PICES XVII on
 “Linking biology, chemistry, and physics in our observational systems –
 present status and FUTURE needs”**

Numerical models are becoming increasingly complex, attempting to integrate vertically and horizontally ecosystem forcing, processes and predictions across multiple trophic levels from bacteria to human populations. Data requirements for daily, seasonal, annual and decadal predictions differ according to single species, species assemblages or multi-trophic level interests. To add to the challenge, the types of sensors and frequency of measurements vary greatly across ecosystem components, particularly the biological sector. This session encourages contributions that: (1) define and specify the types, frequency, duration and spatial resolution of observational data required for current numerical models; (2) review existing and emerging advanced technologies capable of

supplying biomass and species or functional group information; (3) review existing and emerging data sources and technologies capable of integrating these data with physical and chemical information; and (4) showcase novel data assimilation techniques and formal organization of data or database frameworks that facilitate the operational use of observational data to predict the effects of anthropogenic and climate forcing on the major ecosystems of the North Pacific.

Recommended Convenors: Jeffrey M. Napp (U.S.A.) and Young Jae Ro (Korea) from MONITOR; Hernan Garcia and Allen Macklin (U.S.A.), Toru Suzuki (Japan) and a Chinese representative from TCODE.

