

REPORT OF MODEL TASK TEAM



The meeting of the MODEL Task Team (hereafter MODEL) was held from 14:00–18:00 hours on October 15, 2006. The Co-Chairmen, Drs. Thomas C. Wainwright and Shin-ichi Ito, called the meeting to order and welcomed the participants (*MODEL Endnote 1*). The draft agenda was reviewed and adopted (*MODEL Endnote 2*). During the meeting, the participants discussed:

- the accomplishments of MODEL over the past year;
- the outline for the next major PICES scientific program (FUTURE);
- plans for 2006-2007;
- requests for travel to future meetings;
- various new businesses; and,
- the MODEL membership and selection of a new MODEL Co-Chairman.

MODEL accomplishments after PICES XIV (Agenda Item 3)

The APN (Asia Pacific Network) project “*Climate interactions and marine ecosystems*” (PIs: Drs. Francisco E. Werner and Bernard A. Megrey) resulted in a series of successful workshops focused on modeling differences in Pacific herring growth in four locations: Bering Sea, Prince William Sound, West Coast of Vancouver Island, and Oregon Coast. Major hypotheses were addressed for three issues:

- geographic variation in fish growth;
- understanding of regime shifts;
- global climate change effects on energy pathways and fish production.

For all three issues, models were successfully developed and applied to evaluate basic relationships, but the project was not able to develop forecasts of future climate change scenarios. This project is now completed, and resulted in more than 10 conference presentations and more than 10 publications, as well as developing analytic capacity among the participants.

The project “*Fluctuations of marine coastal fisheries of sardines and anchovies and their impact on fishing-dependent human communities*”, funded by APN’s CAPaBLE program, has been completed. CDs with the report were distributed at the MODEL meeting by Dr. Michio J. Kishi (lead PI of the project). A brief report is also available in the August 2006 APN Newsletter at <http://www.apn-gcr.org/en/products/nl.html>.

The project “*Software framework for integrating marine ecosystem model*” (PIs: Drs. Thomas C. Wainwright and Bernard A. Megrey) was funded by NOAA in 2005. The objectives of the project are to:

- integrate NEMURO and NEMURO.FISH in the Earth System Modeling Framework (ESMF);
- provide a web-based interface for the NEMURO and NEMURO.FISH models;
- provide users’ guides and documentation on the web.

This project is still in progress, and it is expected that the Fortran model code will be available in spring 2007, with documentation and the web interface available later in 2007. The project will make the NEMURO code easier to integrate into other U.S. Climate Change research efforts and will also provide web-based tools to facilitate long distance collaboration.

MODEL had agreed previously to publish the scientific contributions of NEMURO and NEMURO.FISH as a special issue of *Ecological Modelling*. Drs. Kishi, Megrey, Ito and Werner are the Guest Editors of the special issue. This special issue is now in press, and is expected to be printed in February or March 2007. The issue contains 19 papers, including 15 research articles and 4 introductory and summary articles.

A FRA/APN/PICES/GLOBEC/IAI workshop on “*Global comparison of sardine, anchovy and*

MODEL-2006

other small pelagics: Building towards a multi-species model” was held November 14-17, 2005, in Tokyo (Japan). The purpose of the workshop was to extend the NEMURO.FISH model to simultaneously simulate sardine and anchovy bioenergetics (NEMURO.SAN). Several talks related to this project will be presented at the PICES XV Topic Session (S6) on “*Modeling and historical data analysis of pelagic fish, with special focus on sardine and anchovy*”.

Dr. Harold P. Batchelder reported on the PICES/GLOBEC Symposium on “*Climate variability and ecosystem impacts on the North Pacific: A basin-scale synthesis*”, held April 19–21, 2006, in Honolulu, U.S.A. From the symposium, 19 papers have been submitted to a special issue of *Progress in Oceanography*, but not all may be published. Outlets for other CCCC products are the GLOBEC Open Science Meeting in May 2009 and a planned GLOBEC Synthesis Book.

Drs. Megrey and Ito attended an ESSAS (Ecosystem Studies of Sub-Arctic Seas) workshop held June 12–14, 2006, in St. Petersburg (Russia). Three working groups were established, including one on modeling. The long-term goal of ESSAS is to use a comparative approach to look at effects of climate change, similar to the work of MODEL.

MODEL assisted with the first PICES/CREAMS summer school on “*Ocean circulation and ecosystem modeling*”, held August 23–25, 2006, in Busan, Korea. Thirty-seven students from 8 countries (including all six PICES countries, plus Indonesia and Chile) attended the school. The schedule was quite full, and organizers should reconsider whether the same amount of material should be presented in the future. All lectures are available on the PICES website. The lecturers from MODEL (Drs. Ito, Kishi and Goh Onitsuka) recommended that rather than introducing new concepts in future summer schools, the topics should be revisited to improve the lecture materials and make the lectures more polished. A proposal has been received from Japan to host the second PICES summer school on “*Ecosystem-based management*” in September 2008, at Hokkaido University, in Hakodate, Japan.

In the past, Dr. Megrey maintained a website for MODEL at the NOAA Alaska Fisheries Science Center, where there was public access to MODEL reports and workshop products, as well as a private exchange area for works in progress. Due to changes in web policy at NOAA, that site was discontinued. With the gracious assistance of Ms. Julia Yazvenko, PICES Database and Web Administrator, all information from the old site was transferred to the MODEL page at http://pices.int/members/task_teams/MODEL.aspx. That page now provides public access to all MODEL reports, workshop archives, and NEMURO model code. There is also a link to a private page for work in progress.

At PICES XV, an IFEP/MODEL workshop (W1) on “*Modeling iron biogeochemistry and ocean ecosystems*” was held on October 13, 2006. MODEL also sponsored three Topic Sessions at PICES XV: “*Modeling and historical data analysis of pelagic fish, with special focus on sardine and anchovy*” (S6, October 17), “*Key recruitment processes and life history strategies: Bridging the temporal and spatial gap between models and data*” (S7, October 19, joint with FIS), and “*Synchronous and asynchronous responses of North Pacific boundary current systems to climate variability*” (S10, October 20, joint with MONITOR and POC). Summaries of the workshop and sessions are included in the *Session Summaries* chapter of this Annual Report.

Discussion of PICES FUTURE scientific program (Agenda Item 4)

MODEL members reviewed the draft outline for a new PICES integrative scientific program: FUTURE (*Forecasting and Understanding Trends, Uncertainty and Responses of the North Pacific Ecosystem*). There was a general consensus that the direction of the proposal is a good one, and the focus on forecasting system response to climate change is consistent with MODEL’s planned future directions. There were, however, a number of concerns expressed by individual Task Team members (not a consensus of MODEL as a whole):

- The proposal emphasizes scientific work in a policy and management context, but it is not clear who are the intended “clients”.
- FUTURE is substantially different from the CCCC Program in that FUTURE has an outside constituency—this would require a different approach to science.
- Forecasts are technically feasible, but quality of forecasts will be a major issue. In particular, ecosystem models cannot yet provide useful long-term forecasts.
- PICES should be focused on doing good science, not on tailoring science to perceived management needs; if science is high quality, managers will embrace it.
- Management systems differ among member countries, and it is not clear that a single program can address the needs of all.
- The focus on management and communications could require a new group within PICES to interpret science for management and the public. Research scientists are not the best people to play the science policy role.

Planning for 2006–2007 and travel support requests (Agenda Items 5 and 6)

Topic Sessions at PICES XVI

MODEL proposes a 1-day Topic Session (joint with CFAME and FIS) on “*Towards ecosystem-based management: Recent developments and successes in multi-species modeling*” (MODEL Endnote 3). Travel funds from PICES are requested for 1 invited speaker.

MODEL also supports a 1-day Topic Session (joint with POC and MONITOR) on “*Operational forecasts of oceans and ecosystems*” (POC Endnote 4). Travel funds from PICES are requested for 1 invited speaker.

Inter-sessional workshops

Drs. Ito and Wainwright will attend a FRA international workshop on “*Collaborative studies for ecosystem variation and climate change in the North Pacific*” to be held on October 21–23, 2006, in Yokohama.

No inter-sessional workshops are planned for 2007.

Other new business (Agenda Item 7)

MODEL was contacted by Dr. Ivo Grigorov of the Eur-OCEANS project regarding the inclusion of NEMURO and NEMURO.FISH in the Eur-OCEANS online database of ocean models. Dr. Kishi has been designated as the liaison between MODEL and Eur-OCEANS, and will provide the NEMURO model information for their database.

Dr. Werner is leading a proposal to the U.S. NSF PIRE program, with the purpose of linking Norwegian, Japanese, and U.S. research on marine ecosystems and forecasting. Brief pre-proposals are due at the end of October 2006. This project would have a strong emphasis on education as well as research, with inclusion of two summer schools to be held at NCAR in the United States. Research work would be related to work under the ESSAS program.

Dr. Jacob Schweigert announced the upcoming Tri-national (U.S., Canada, Mexico) Sardine Forum to be held November 1-3, 2006, in Vancouver, (Canada). This forum may be an important venue for MODEL work.

Dr. Yahusiro Yamanaka reported on planned further developments of the NEMURO and NEMURO.FISH models, which will be coupled with higher resolution ocean circulation models under new funding from JST/CREST and MEXT. This activity will be tied in with development of a new Peta-FLOPS computer, to be built in 2011.

Rotation of membership and selection of new MODEL Co-Chairman (Agenda Item 8)

Chairmanship

Dr. Shin-ichi Ito rotated off as Co-Chairman of MODEL, and the members enthusiastically recommended Dr. Hao Wei (China) as the new MODEL Co-Chairman. MODEL members offered great thanks to Dr. Ito for his strong leadership and efforts over the past years.

MODEL-2006

Membership

- Two members from Russia (Drs. Irina Ishmukova and Gennady Kantakov) are unable to continue serving on the Task Team, and MODEL requests their replacement. Dr. Anatoly Burago (TINRO) was suggested as a potential candidate.
- MODEL also requests the addition of one new member from Canada as presently the only Canadian member is Dr. Jacob Schweigert.

MODEL Endnote 1

Participation list

Members

Shin-ichi Ito (Japan, Co-Chairman)
Michio J. Kishi (Japan)
Bernard A. Megrey (U.S.A.)
Goh Onitsuka (Japan)
Jacob Schweigert (Canada)
Thomas C. Wainwright (U.S.A., Co-Chairman)
Francisco E. Werner (U.S.A.)
Sinjae Yoo (Korea)
Yury I. Zuenko (Russia)

Observers

Vera Agostini (U.S.A.)
Kerim Y. Aydin (U.S.A.)
Harold P. Batchelder (U.S.A.)
Fei Chai (U.S.A.)
Taketo Hashioka (Japan)
Skip McKinnell (PICES)
Ig-Chan Pang (Korea)
Kenneth Rose (U.S.A.)
Yasuhiro Yamanaka (Japan)
Naoki Yoshie (Japan)

MODEL Endnote 2

MODEL Task Team meeting agenda

1. Welcome and introduction of members
2. Review of agenda and inclusion of new items as needed
3. Review of MODEL accomplishments after PICES XIV
 - a. APN project “*Climate interaction and marine ecosystems*”
 - b. APN CAPaBLE project
 - c. NOAA project “*Software framework for integrating marine ecosystem models*”
 - d. *Ecological Modelling* special issue
 - e. APN/FRA/PICES/GLOBEC/IAI joint workshop (November 2005)
 - f. April 2006 CCCC Synthesis Symposium
 - g. June 2006 ESSAS workshop
 - h. August 2006 PICES/CREAMS summer school
 - i. Update on MODEL web page
 - j. Discussion/review/preview of workshops and Topic Sessions at PICES XV
4. Discussion of PICES FUTURE scientific program
5. Planning for 2007-2008
6. Requests for travel to future meetings
7. Other new business
8. Rotation of membership and selection of new MODEL Co-Chairman
9. Announcements

MODEL Endnote 3

Proposal for a 1-day CCCC/FIS Topic Session at PICES XVI on “*Towards ecosystem-based management: Recent developments and successes in multi-species modeling*”

Ecosystem-based management is becoming a focus for many fisheries and their management agencies worldwide. Much of the success of this

initiative will require improvements in understanding the interactions and linkages among species at both the lower trophic level

(LTL) and higher trophic level (HTL) within regional ecosystems. The recent success of modeling tools such as NEMURO.FISH in linking LTL forcing to the forecasting of fish growth for a number of pelagic forage species is encouraging. Ecosystem-based management will require the extension of this and/or similar approaches to multi-species systems. A variety of modeling tools is already in wide use to address this issue, including Ecopath/Ecosim, NEMURO, various IBM models, and others. This session will focus on contrasting different approaches to multi-species modeling and

evaluating their performance as a vehicle for assessing and forecasting the effects of climate change on ecosystem function. We encourage presentations that will highlight critical ecosystem interactions relevant for fishery management, and discuss how knowledge of these interactions will move us closer to ecosystem based fishery management.

Recommended convenors: Vera Agostini (U.S.A.), Shin-ichi Ito (Japan), Jacob Schweigert (Canada) and Chang Ik Zhang (Korea).

