

REPORT OF TECHNICAL COMMITTEE ON DATA EXCHANGE

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The meeting of the Technical Committee on Data Exchange (TCODE) was held from 16:00-19:30 hours on October 18, 2006. The Chairman, Dr. Igor I. Shevchenko, called the meeting to order and welcomed the participants. The meeting was attended by 7 TCODE members and 5 observers representing all PICES member countries and international organizations (*TCODE Endnote 1*). Mr. Robin M. Brown served as rapporteur. The Committee reviewed the provisional agenda, and it was adopted with several items added to New Business (*TCODE Endnote 2*).

Review progress on items in the 2005/2006 Workplan (Agenda Item 3)

Assistance with HAE-DAT database activities

The Committee reviewed the progress made with the development of the HAE-DAT (Harmful Algal Event Database) partnership. The new version of the IOC-ICES-PICES database was introduced at the HAB-S meeting. This version will allow users to input, view and search data on-line (<http://www.iode.org/haedat>) and to get maps via a map server. The system will be open within 1 month after PICES XV and will be on trial for several months before it is revised into its final format. It was recommended that continued assistance with the database and required metadata be provided to the Section on *Ecology of harmful algal blooms in the North Pacific*.

Convene joint MONITOR/TCODE Workshop at PICES XV on dense/real time data systems

A 1-day MONITOR/TCODE Workshop on “*Data management, delivery and visualization of high-volume data products*” was convened on October 15. Presentations covered a wide range of topics. Summaries of posters and e-posters were presented as a part of the workshop. After

the presentations, there was a lively discussion of future directions. The summary of the workshop is included elsewhere in this Annual Report.

Update NPEM and TCODE inventory

The North Pacific Ecosystem Metadatabase (NPEM) now contains all records from the TCODE metadata inventory, but there are questions about who is responsible for updating metadatabase. Current methods such as internal QC checking and regular mailout notifications are routine. It seems that only federated searching could be considered as the real solution.

Establish a dialogue with ICES Working Groups involved in data management issues

Dr. Shevchenko contacted Drs. Michele Fichaut and Helge Sagen, Co-Chairmen of the ICES Working Group on *Marine Data Management* (WGMDM). Dr. Georgiy Moiseenko, a member of WGMDM, attended their meeting (May 8–10, 2006, in Copenhagen, Denmark) and made a presentation on PICES TCODE activities. Some interest was expressed in making contacts and coordinating activities with TCODE. The WGMDM Co-Chairmen were invited, but were unable to attend PICES XV, as WGMDM will be disbanded by the end of 2006, and a new ICES Working Group on *Data and Information Management* (WGDIM) will be established. WGDIM will provide ICES with advice on all aspects of data management including technical, data policy, data strategy and user-oriented guidance, and will meet for the first time from June 12–14, 2007, in Copenhagen. Dr. Sagen and two former Co-Chairmen of the ICES Study Group on *Management of Integrated Data* (SGMID), Drs. Christopher Zimmermann and Peter Wiebe, will serve as Co-Chairmen of WGDIM.

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At the 2006 ICES Annual Science Conference, Dr. Bernard Megrey participated in the theme session on “*Environmental and fisheries data management, access, and integration*” and discussed with session convenors, Drs. Zimmermann, Sagen and Wiebe, possible joint sponsorship of future meetings of mutual interest by the newly formed ICES WGDIM and PICES TCODE. A WGDIM plan is to sponsor a data theme session every other year to track new developments in this quickly changing field. TCODE should consider co-sponsoring these sessions to strengthen ties between ICES and PICES data management activities. In particular, there was some discussion about asking WGDIM, after it is formally constituted, to co-sponsor a TCODE session at PICES XVI in Victoria, Canada. Drs. Moiseenko and Megrey will report, through the TCODE Chairman, on changes in ICES groups and future opportunities for collaboration.

PICES Federated Searching Project

The objectives of the PICES project “*Federate metadata on North Pacific ecosystems*” were to create standardized metadata descriptions of national, institutional and agency databases and to serve those descriptions in a web-based, one-stop environment with search and delivery capability. In Phase I, KODC (Korean Oceanographic Data Center) and NPEM personnel, using partial support from PICES, developed the application over a year, with major progress coming from joint meetings held in August 2005 (Seattle, U.S.A.) and October 2005 (Busan, Korea). KODC had translated some metadata records to English and became a registered node of the National Spatial Data Infrastructure (NSDI) clearinghouse (<http://registry.fgdc.gov/serverstatus/>). A paper by S. Allen Macklin, Bernard A. Megrey, Kyu-Kui Jung and Hae-Seok Kang on Korea and U.S. federate marine metadata collections was published in *PICES Press* (Vol. 14, No. 1). Recently, Hae-Seok Kang has brought servers on-line and now more than 700 Korean records are available.

The PICES Federated Searching Project was continued in 2006. A workplan similar to that

developed for NPEM-KODC federation was used. Phase II included two successful planning meetings of NPEM and MIRC (Marine Information Research Center, Japan) personnel, again with partial support from PICES, to discuss required technical details and hurdles and the means to address and solve problems associated with metadata federating. A draft report on “*Metadata federation of PICES member countries*” was prepared by Bernard A. Megrey, S. Allen Macklin, Kimberly Bahl and P. Daniel Klawitter to provide technical guidance for anyone wishing to become a partner of this federation. The report will be finalized after its review by TCODE members.

Dr. Megrey described a change in international metadata standards from FGDC (Federal Geographic Data Committee) to ISO 19115 and its biological extensions. As a member of ISO (International Organization of Standards), the United States is required to adopt these standards. This will lead to modifications in the PICES metadata clearinghouse interface standards and will require changes for existing and future clearinghouse servers.

With the move of the U.S. metadata clearinghouse interface from proprietary to open source software, the potential exists for PICES to adopt the open source standard, federate metadata internally and sever their relationship with the U.S. clearinghouse nodes. Related costs, consequences and benefits of this approach and recommendations were briefly discussed. The Committee asked Mr. Macklin to consider opportunities for establishing Asian-side “mirror” clearinghouse servers with the FGDC/NSDI Secretariat.

After the completion of Phases I and II of the project, the PICES Metadata Federation will include 5 nodes (PICES-NPEM, PICES-KODC, PICES-NFRDI, PICES-TINRO and PICES-MIRC) from 4 countries (the United States, Republic of Korea, the Russian Federation and Japan).

Future participation of Canada and China in the PICES Metadata Federation may be possible through NSDI-CAP (NSDI Cooperative

Agreement Program) funding, and TCODE will pursue this option. TCODE also requests that PICES support Phase III of this project at the same level (US \$4,000) as Phases I and II (pending successful funding applications elsewhere) (*TCODE Endnote 3*).

National annual reports (Agenda Item 4)

TCODE members from all member countries, Robin Brown (Canada), Ruguang Yin (China), Tomowo Watanabe (Japan), Kyu-Kui Jung (Korea), Georgiy Moiseenko (Russia) and Bernard Megrey (U.S.A.), presented national annual reports. These reports include lists of key institutes and agencies, key persons and contacts, links to data and metadata sets, ocean observing systems, data and metadata formats and standards, information technologies for collecting, measuring and enumerating marine organisms, marine data management programs that underpin marine science programs, data policies, software applicable in marine ecosystems studies and modeling, publications on marine data management issues, education materials, *etc.* All reports are posted at <http://tcode.tinro.ru/pices15.html>.

Updates on data management activities in PICES member countries and international organizations (Agenda Item 5)

Mr. Norio Baba (Japan) described ongoing data management programs of NOWPAP (Northwest Pacific Action Plan) and potential areas of collaboration with PICES. Regional Activity Centers of NOWPAP deal in particular with harmful algal blooms. Mr. Baba expressed interest in the Metadata Federated Searching Project and mentioned funding opportunities for capacity building to generate metadata records.

Discussion of new PICES integrative science program, FUTURE (Agenda Item 6)

The Committee reviewed the program description. There was much discussion about “prediction” and the difficulty it implied. TCODE could assist in some of the underpinnings (or infrastructure) of such a program through a federated metadata searching

capability. Metadata inventories also contribute to outreach. TCODE could continue to showcase new approaches to data integration, visualization and management. There was a feeling that the targeted “clients” of the program (governments, policy and resource managers) might not be all receptive. TCODE was designed to support the science program of PICES. However, at the moment, it is somewhat difficult to understand exactly what the requirements might be.

Planning for PICES XVI (Agenda Item 7)

TCODE proposed a scientific/e-poster session for PICES XVI on “*Data management, data analysis and data delivery systems to support detection and prediction of ecosystem change in the North Pacific and the Arctic and its impacts*” (*TCODE Endnote 4*).

PICES XVII theme (Agenda Item 8)

TCODE supported the proposal for the PICES XVII theme, “*Beyond observation of the North Pacific environment: Rebuild, nowcast and forecast*”. Some concern was expressed that the wording seems narrow and could be improved by replacing “environments” with “ecosystems”.

Relations with other international programs and organizations (Agenda Item 9)

No proposals on updates for the PICES Standing List of International and Regional Organizations and Programs were made. Potential relations with ICES and NOWPAP were discussed under Agenda Items 3 and 5.

Election of TCODE Chairman and Vice-Chairman (Agenda Item 10)

Dr. Shevchenko was requested, and agreed, to continue for one more year as TCODE Chairman. Dr. Megrey will serve as TCODE Vice-Chairman.

Items with financial implications (Agenda Item 11)

TCODE requests support for:

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- 1 invited speaker to attend the TCODE scientific/e-poster session at PICES XVI;
- Phase III of the PICES project “*Federate metadata on North Pacific ecosystems*” (pending successful funding applications) (see *TCODE Endnote 3*).

New business (Agenda Item 12)

At the recommendation of the F&A Committee, TCODE asked Mr. Brown to be an advisor to the PICES Secretariat review of electronic publishing and archiving activities.

TCODE strongly supported a proposal by Dr. Tokio Wada for a PICES Monitoring Service Award. The award aims to recognize the organizations and groups of PICES member countries for their contribution to the progress of marine science in the North Pacific through their long-term monitoring operations and data management.

TCODE recommended that a new electronic PICES Technical Report series be established and that the report on “*Metadata federation of PICES member countries*” be published in this series.

To reduce publishing costs, PICES should adopt a practice common to other scientific meetings (e.g., ICES and AFS) to print only the meeting schedules and to prepare the Book of Abstracts for Annual Meetings and other symposia in CD-ROM format only. The CDs would be distributed to all meeting participants. It would

be very convenient to include key URLs for every paper in the Book of Abstracts (CD).

TCODE Workplan for 2006/2007 (Agenda Item 13)

Based on the discussion of all agenda items, the Committee adopted the following workplan:

- Continue to support HAB-S work with HAE-DAT database and required metadata (Responsibility – R. Brown);
- Continue Federated Metadata Searching Project (S.A. Macklin, B.A. Megrey, I. Shevchenko, N. Baba):
 - Complete Phase II report and promote use of metadata;
 - Carry out Phase III, including capacity building;
 - Investigate utility of an Asian-side metadata server;
 - Publish a report on “Metadata federation of PICES member countries” in the proposed PICES Technical Report series;
- Organize the scientific/e-poster session on “*Data management, data analysis and data delivery systems to support detection and prediction of ecosystem change in the North Pacific and the Arctic and its impacts*” at PICES XVI (K.K. Jung, S.A. Macklin);
- Develop collaboration with ICES Working Group on *Data and Information Management* (G. Moiseenko, B.A. Megrey, I. Shevchenko);
- Provide advice on electronic publishing and archiving to the Secretariat (R. Brown);
- Coordinate activities with MONITOR Technical Committee (T. Royer).

TCODE Endnote 1

Participation list

Members

Robin M. Brown (Canada)
Kyu Kui Jung (Korea)
Bernard A. Megrey (U.S.A.)
Georgiy Moiseenko (Russia)
Igor I. Shevchenko (Russia)
Tomowo Watanabe (Japan)
Ruguang Yin (China)

Observers

Norio Baba (NOWPAP)
John Holmes (Canada)
S. Allen Macklin (U.S.A.)
Toru Suzuki (Japan, CC-S liaison)
Joon Yong Yang (Korea)

TCODE Endnote 2**TCODE meeting agenda**

1. Welcome and introduction of members
2. Adoption of agenda
3. Review progress on items in the 2005/2006 Workplan:
 - a. Continue to support HAB-S work with HAE-DAT database and required metadata
 - b. Convene joint MONITOR/TCODE Workshop at PICES XV on dense/real-time data systems
 - c. Update NPEM and TCODE inventory
 - d. Initiate a dialogue with ICES Working Groups involved in data management issues
 - e. Prepare and post a report on the PICES Federated Searching Project: Phase I
 - f. Continue the PICES Federated Searching Project: Phase II
 - g. Update TCODE Action Plan
 - h. Coordinate activities with MONITOR
4. National annual reports
5. Updates on data management activities in PICES member countries and international organizations
6. FUTURE (new PICES integrative science program)
7. Planning for PICES XVI
8. PICES XVII theme
9. Relations with other international programs and organizations
10. Election of TCODE Chairman and Vice-Chairman
11. Items with financial implications
12. New business:
 - a. Review of PICES electronic publishing and archiving
 - b. Monitoring Service award
 - c. PICES Technical Report series
 - d. Book of Abstracts on CD-ROM
13. TCODE Workplan for 2006/2007

TCODE Endnote 3**Data-sharing project “*Federate metadata on North Pacific ecosystems: Phase IIP*”**

Significant progress has been made over the past two years to connect PICES member nations’ metadatabase systems into one integrated resource. With this new scientific resource, a user of any one metadata inventory will have the ability to search for data catalogued by any and all other participating systems with a single search request. Using modern data management techniques to cross-search separate metadatabases provides the advantages of shared metadata without compromising national ownership, data integrity, or security of national metadata products.

TCODE adopted a pilot KODC-NPEM federation as part of its 2004/2005 Workplan. In Phase I of this project, the first two PICES nodes (PICES-NPEM and PICES-KODC) were registered with the National Spatial Data Infrastructure (NSDI) clearinghouse. Since then another Korean node (PICES-NFRDI KODC) and a Russian node (PICES-TINRO Metadata Node) have been brought on line.

In Phase II of this project, with the successful 2006 NSDI Cooperative Agreement Program (CAP) proposal “North Pacific Ecosystem Metadata Federation: Japanese Component” and PICES support, a Japanese node (PICES-MIRC) was brought on-line on October 19, 2006.

The status of the PICES nodes can be found at <http://registry.fgdc.gov/serverstatus/> by scrolling down to the servers whose name begins with PICES, and the nodes can be searched by going to <http://clearinghouse3.fgdc.gov/>. The PICES Metadata Federation now includes 5 nodes from 4 countries (Japan, Republic of Korea, the Russian Federation and the United States of America). The addition, in the nearest future, of Chinese and Canadian metadata will complete the Metadata Federation of PICES nations. The new 2007 NSDI CAP announcement will appear in early November, and we plan to prepare at least one proposal to complete the PICES Metadata Federation.

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We propose, as Phase III of the project, to federate with Canada and/or the People's Republic of China and ask PICES to continue to support this project at the same level as last year (US \$4,000), conditional on three essential elements: (1) confirmation by Canada and/or China that they are willing to federate metadata; (2) that there will be suitable programs in the upcoming announcement by the NSDI CAP against which we can propose for further financial assistance; and (3) that TCODE can prepare a successful proposal to the NSDI CAP.

Since NSDI CAP funds cannot be programmed to foreign countries, PICES support will enable travel for training of non-U.S. personnel to attend planning meetings to discuss technical issues related to metadata standards and communication protocols required by the clearinghouse.

Proponents of the proposal: S. Allen Macklin (NOAA/PMEL, U.S.A.) and Bernard A. Megrey (NOAA/AFSC, U.S.A.).

TCODE Endnote 4

Proposal for a Topic Session at PICES XVI on

“Data management, data analysis and data delivery systems to support detection and prediction of ecosystem change in the North Pacific and the Arctic and its impacts”

Profound changes have occurred in the North Pacific climate system, in the composition, abundance and distribution of its living marine resources, and in the human societies that depend on the North Pacific Ocean and its resources. New and novel techniques are needed to handle the ever-increasing volume of scientific data and to understand its meaning with respect to climate variability, anthropogenic impacts and the combined impacts that these changes have already had, and can be expected to have, on North Pacific ecosystems. This session will address methods

such as high-volume data management, cabled observatories, regime shift detection and prediction, and ocean observing systems. Presentations describing links with climate and ecosystem change in the Arctic and relating to the International Polar Year Projects are also welcome. Oral presentations and electronic posters are encouraged.

Recommended convenors: Kyu Kui Jung (Korea) and S. Allen Macklin (U.S.A.).