NSDI-CAP Final Report
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Title: North Pacific Ecosystem Metadata Federation: China Component
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Final Report
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1. Project Narrative

NSDI supported the entry of People's Republic of China's National Marine Data and Information Service ~~Service~~ of the State Oceanic Administration (SOA) into a federation of Pacific Rim countries supplying marine ecosystem metadata. The federation effort is led by personnel of the North Pacific Ecosystem Metadatabase (NPEM). This final report contains information from our two NMDIS-NPEM Metadata Federation organizational and planning meetings which took place at SOA's National Marine Data and Information Service (NMDIS, Tianjin, China, August 30-31, 2007, and during the PICES Annual Meeting in Victoria British Columbia, Canada, October 30, 2007.

1.1. First Planning Meeting

Participants: Dr. Ruguan Yin, (NMDIS), Dr. Bernard A. Megrey, (NOAA/AFSC), Ms. Kimberly Bahl, (UW/JISAO), Dr. Jixiang Chen (NMDIS), Fangfang Wan (NMDIS), Dongmei Qi (NMDIS)), Dr. Li Qin (NMDIS), Lei Zhang (NMDIS), Shuangjian Li (NMDIS), and Prof. Shaohua Lin (NMDIS). Unable to participate: S. Allen Macklin (NOAA/PMEL).

The meeting was opened with all participants introducing themselves. Then Professor Shaohua Lin, Director General of the NMDIS, gave an extensive overview of the organization, activities, and responsibilities of NMDIS. Dr. Megrey then presented a history and overview of the NPEM and PICES federation project. The overview was based on a presentation given at the previous annual PICES meetings. Two elements are needed for federation: metadata in a standard format and a common communication protocol. The PICES federation uses the FGDC metadata standard and Z39.50 protocol.

Drs. Yin and Chen then discussed the nature of NMDIS data holdings available through NMDIS and SOA.

There was a brief walking tour of NMDIS. Professor Lin and Dr. Yin introduced Megrey and Bahl to leadership at NMDIS and showed them essential center spaces.

Kimberly Bahl introduced FDGC and NPEM websites and provided a live metadata search demonstration. Presently the NSDI Clearinghouse legacy search gateway fails to connect with the NPEM Clearinghouse node. The legacy search gateway is built with propriety software that is no longer maintained and supported by the vendor, Blue Angel Software. The legacy interface has been replaced with GeoNetwork, a user-maintained and open-source solution with similar and enhanced capabilities compared to the legacy interface. A demonstration of GeoNetwork (via a demonstration server) provided successful search results.

Kimberly Bahl, who received training from FGDC two years ago, conducted her second international training session. She introduced the FGDC metadata content standard and its sections and elements. This gave the NMDIS team the metadata rules to write FGDC-compliant metadata records from NMDIS information.

Kimberly Bahl demonstrated several open-source metadata creation and validation tools, Metavist 2005 and Metadata Parser (MP). These tools allow easy creation of individual metadata records in XML file format (required for any clearinghouse node) and validation that they are FGDC compliant. Participants used Metavist and MP to create and validate an XML metadata record from English-translated NMDIS metadata records. This completes the first requirement for federation: FGDC compliant metadata.

The second requirement for PICES federation is to supply a common communication protocol: Z39.50. Kimberly Bahl provided specific instructions of how to install and configure the Isite application that allows the use of Z39.50 protocol. The Isite software suite is a free, open-source application available from the FGDC website. The server hardware at NMDSI is all Windows-based, so we had to install a Windows version on Isite. This presented some installation difficulties, as the on-line documentation was not clear and seemed to contain contradictory information. Since the meeting, our team has acquired the software and, in consultation with Isite technical support, successfully installed the system on a Seattle server. We logged our steps and have prepared an amended set of installation instructions for our Chinese colleagues. This was emailed to them on October 3, 2007.

NMDIS has numerous metadata records already in English. We spent considerable time demonstrating MetaVist, so that NMDIS can begin to migrate their metadata into the XML file format.

During the meeting we encountered two problems. One major unanticipated problem was that the firewall hardware at NMDIS is old and cannot allow the secure opening of a port to the Internet, a critical step for registering the clearinghouse node. Thus we were not able to register a NMDIS node while in China. Dr. Yin stated that new firewall hardware is expensive, and he did not know when an upgrade would be possible. After coming back to the United States, our team investigated the possibility of contracting a 3rd party web service to lease or rent the necessary hardware until NMDIS could acquire more modern firewall hardware. With this strategy, we could register an active NMDIS node before the end of this project. The second problem was that MP Batch did not work with MS Windows using the Chinese language option. We were able to confirm that the MP Batch GUI interface worked with the English version of Windows by trying it on a NOAA laptop, but it would not operate correctly with a Chinese version of Windows. We expect that it will not work with any other Asian country Windows OS.

In addition, we discussed the strategies for long-term funding and progress reports on this project and overall PICES federation. These are given in the table below.

The remainder of the meeting was spent discussing strategies for implementing a China clearinghouse node and dealing with the problems and challenges of locating ongoing funding for the PICES federation. PICES has been very supportive but has limited resources. At present, funding from within NOAA is unlikely. Despite numerous efforts, attracting money from international funding organizations has not been successful. There is a possibility that NOWPAP (Northwest Pacific Action Plan) may be able to provide support for a federation. The meeting ended with NMDIS plans to develop a demonstration site using Isite and the XML record created at this meeting. If the firewall issue could be resolved, they would register the NMDIS node at the clearinghouse.

1.2. Second Planning Meeting

Participants: Dr. Ruguan Yin, (NMDIS), Dr. Bernard A. Megrey, (NOAA/AFSC), Ms. Kimberly Bahl, (UW/JISAO), Dr. Jixiang Chen (NMDIS),

The second planning meeting was held in Victoria British, Columbia, Canada, in October 2007 in conjunction with the annual PICES meeting. Meetings were held at the Victoria Convention Center.

Participants reviewed issues raised at the PICES Technical Committee on Data Exchange (TCODE_ meeting, which took place a day earlier. These included the advantages of promoting the metadatabase in NOWPAP DINRAC (NOWPAP's Data and Information Network Activity Center). Participants discussed the relationship between PICES TCODE and NOWPAP DINRAC activities, new opportunities for capacity building, and the utility of an Asian-side metadatabase mirror server.

Our Chinese colleagues let us know that the NMDIS firewall issue could not be solved in the near future. We proposed to rent a commercial server so that the new PICES-NMDIS node could be installed, configured and registered to the NSDI clearinghouse. Meanwhile, NMDIS could continue to work on solving their firewall issue. The Chinese participants agreed in principal with the idea, but they had to check with their laboratory administration to get final permission and clearance to release their metadata on the rented server.

Participants reviewed the progress on the Tianjin meeting action plan and amended the action plan based on the Victoria meeting discussions.

1.3 Subsequent Activity

After receiving a no-cost extension to this grant, we secured a rental server from ADHOST, a commercial provider, and configured it to allow nodes of service, e.g., NMDIS, to the NSDI Clearinghouse. NMDIS uploaded their XML metadata records to ADHOST and we registered the NMDIS node with FGDC on September 23, 2007. Additional agencies (NPEM, TINRO, MIRC) have also created nodes on this server.

1.4. Summary of Project Accomplishments

Meetings:

- NSDI-CAP 2006 Orientation Workshop, Boulder, CO, May 17, 2007.
- First NPEM-NMDIS Workshop, Tianjin, China August 30-31, 2007.
- Second NPEM-NMDIS Workshop, Victoria, British Columbia, Canada, October 30, 2007.

- PICES Annual Meeting, October 12-22, 2007, Victoria, British Columbia, Canada.
- PICES Annual meeting, October 27-November 2, Dalian, China.

Presentations:

- Bahl, K. Steps to Developing a Clearinghouse Node. Presented at the First NPEM-NMDIS Workshop, Tianjin, China, August 30, 2007.

- Megrey, B.A., S.A. Macklin, and K. Bahl. North Pacific Ecosystem Metadatabase. Presented at the First NPEM-NMDIS Workshop, Tianjin, China, August 30, 2007.

- Bernard A. Megrey , Kimberly Bahl, S. Allen Macklin,. 2007. Current status of the PICES Metadata federation. Presented at the first NPEM-NMDIS Workshop, Tianjin, China, August 30, 2007.

- Kimberly Bahl, S. Allen Macklin, Bernard A. Megrey. 2007. North Pacific Ecosystem Metadata Federation: China Component. NSDI-CAP 2007 Orientation Workshop, Boulder, CO, May 17, 2007.

- S. Allen Macklin, Bernard A. Megrey, Kimberly Bahl and Ruguang Yin. "Pacific-wide marine metadata management and delivery: The PICES Metadata Federation". Presented at the PICES Annual Meeting, Session S8/S10, "Recent advances in ocean observing systems: Scientific discoveries, technical developments, and data management, analysis and delivery", PICES Annual Meeting, October 26-November 5, 2007, Victoria, Canada.

- Megrey, B.A. and Macklin, S.A. "Pacific-wide marine metadata discovery, management and delivery. Presented at Session R "Environmental and fisheries data management, access, and integration". ICES Annual Science Conference, Halifax, Canada, September 22-27, 2008.

- Macklin, S.A. Megrey, B.A., and K. Bahl. The PICES Metadata Federation: Pacific-wide marine metadata management and delivery for FUTURE. Presented at the PICES XVII annual Meeting, October 27-November 2, 2008, Dalian, China,

Publications:

- Megrey, B.A., Macklin, S. A., Bahl, K., Ruguan and Yin, Jixiang Chen (in preparation). China joins PICES Marine Metadata Federation. PICES Press.

- Megrey, B.A., Macklin, S. A., Bahl, K. and P. Daniel Klawitter (eds). 2007. Metadata Federation of PICES Member Countries. 2007. PICES Technical Report 1. 159 pp. (web version - http://www.pices.int/publications/tech_reports/tech_rep_1/tech_rep_1.aspx

- Addendum 1 to PICES Technical Report 1 - Instructions for Isite for Windows http://www.pices.int/publications/tech_reports/tech_rep_1/A1-Instructions%20for%20Isite2%20for%20Windows.pdf

- Addendum 2 to PICES Technical Report 1 - Instructions for Isite for Windows ADHOST
  http://www.pices.int/publications/tech_reports/tech_rep_1/A2-
  Instructions%20for%20Isite2%20for%20Windows_ADHOST.pdf

2. Metadata training and outreach assistance

2.1. List organizations and number of individuals receiving metadata training and outreach assistance as appropriate: We trained, Dr. Ruguan Yin, Dr. Jixiang Chen, Fangfang Wan, Dongmei Qi, Dr. Li Qin, Lei Zhang, Shuangjian Li, and Prof. Shaohua Lin, all from NMDIS.

2.2. At what level of proficiency are the trainees or training: We consider the trainees have a good working knowledge of FGDC metadata standards and metadata creation and validation tools.

2.3. Indicate the number and character of workshops conducted as appropriate: Two training and planning technical workshops were conducted during this project. These are described in the narrative.

3. Status of Metadata Service

3.1. Site names where metadata is served; clearinghouse node or Geospatial One-Stop harvestable web folder: All NMDIS metadata are being served from the NSDI Clearinghouse Node (see Figure 7) which can be searched by going to http://gateway.fgdc.gov/gateway/srv/en/gateway.home

3.2. Approximately how many metadata entries have resulted from this project? There are 50 active metadata records at the NMDIS node. We anticipate receiving additional records as metadata translation proceeds.

3.3. Do you need assistance in providing for metadata service to organizations you have assisted? No.

4. Next Steps

4.1. Will this project's activities continue in the future: Minimally on a volunteer basis unless we can locate additional monies to help translate metadata records into English.

4.2. Describe the next phase in your project: Efforts continue to increase the number of metadata records supplied by Korea, Russia and Japan.

4.3. Are there issues in metadata management and service: Many native metadata records require translation to English and FGDC format.

4.4. Requirements (more technical assistance, software, other?): NSDI-CAP grant monies ($20,000) essentially provided startup funds. We estimate that the real cost of the project, including matching monies supplied by PICES, NOAA/PMEL and

NOAA/AFSC were close to $63,000. The opportunity to compete for additional follow-up monies to help sustain the initial efforts of a successful project would be most useful

4.5. What areas need work? English translation of metadata records recorded in a foreign language.

All funds granted to this project under the USGS-NMFS MOU were set up as an expensible account with AFSC which allowed the project monies to carry over into FY 08. Because of the unanticipated technical issues we requested a no cost extension of the project from the initial ending date of April 2008 to the end of November 2008. As of November 30, 2008, all funds have been completely used by the end of the project extension.

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Appendix 1. NMDIS-NPEM meeting agendas

Tianjin Meeting agenda, August 30-31, 2007

Participants:

China: NMDIS   *USA: NPEM*
Ruguang Yin, NMDIS   *Allen Macklin, PMEL, NOAA*
                                                                  Bernard Megrey, AFSC, NOAA
                                                                  Kimberly Bahl, JISAO, UW

Draft Agenda 30-31 August 2007 (9:00 a.m. – 4:00 p.m.)

Day 1

Time	Event	*Facilitator*
09:00	Introductions: Overview of NPEM and Isite	*B. Megrey, A. Macklin*
09:45	NMDIS's Data Overview and Metadata Needs	*R. Yin*
10:30	Walking Tour of NMDIS	*All*
11:30	LUNCH	
13:00	FGDC and NPEM Websites: Overview and Search Demo	*K. Bahl*
14:00	FGDC Metadata Content Standard	*K. Bahl*
15:00	Comment and Discussion	*All*

Day 2

Time	Event	*Facilitator*
09:00	Metadata Creation and Validation Tools	*K. Bahl*
1000	Isite Implementation	*K. Bahl*
11:30	LUNCH	
13:00	NMDIS Metadata and Node Development Strategy	*All*

15:30   Development of Action Plan and Preparation for October   *All*
         Meeting...

NMDIS-NPEM Federation Meeting, August 30-31, 2007, Tianjin, China
Action items

Priority	Task	NPEM	NMDIS
1	Contact NSDI for proper Isite installation instructions and send to Dr. Chen	X	
1	Install and configure Isite software on NMDIS node		X
1	Upgrade Firewall hardware to allow open internet port for NMDIS Node		X
1	Register NMDSIS node with NSDI clearinghouse		X
1	Prepare several English XML metadata records for NMDIS Isite node		X
2	Prepare project meeting minutes	X	X
2	Why cant we send email to NMDIS	X	
2			
3	Prepare project report for PICES TCODE-Victoria	X	X
3			
3	Prepare article for PICES Press	X	X

Victoria meeting agenda, October 30, 2007

Start	End	Event	Participants
09:00	09:30	Introductions and Overview	NMDIS-NPEM
09:30	10:00	Review of Tianjin Meeting	NMDIS-NPEM
10:00	11:00	Review status of action items	NMDIS-NPEM
11:00	12:00	Isite installation tutorial-update	NMDIS-NPEM
12:00	13:30	LUNCH	NMDIS-NPEM
13:30	14:30	Proposal for contracting Isite computer services	NMDIS-NPEM
14:30	15:30	NMDIS Metadata preparation-status	NMDIS-NPEM
15:30	16:30	Discussion of the NMDIS-NPEM federation, including metadata mapping, node registration, etc.	NMDIS-NPEM
16:30	17:00	Next steps, new action items and preparation for TCODE meeting	NMDIS-NPEM
17:00	18:00	Comment and discussion	NMDIS-NPEM

Fig. 1   The first workshop at NMDIS headquarters in Tainjin China l to r: Ruguang Yin, Lei Zhang, Prof. Shaohua Lin, Kimberly Bahl, Bernard Megrey, Jixiang Chen, and. Dongmei Qi.

Fig. 2   The NMDIS workshop participant in font of NMDISs. Front row l-r: Shuangjian Li , Kimberly Bahl, Prof. Shaohua Lin, Bernard A. Megrey, and Ruguan Yin. Back row l-r: Fangfang Wan, Jixiang Chen, Dongmei Qi, Dr. Li Qin, and Lei Zhang,
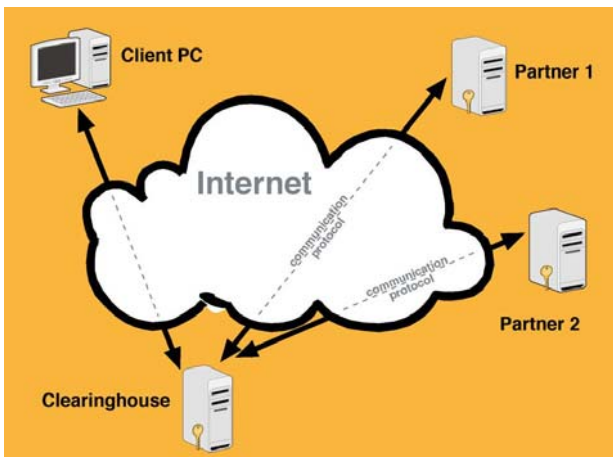

Fig. 3 An Internet metadata federation requires a clearinghouse and partners sharing a communication protocol and serving metadata using the same standard.


Fig. 4   Workshop greeting in lobby of NMDIS.

Fig. 5   Top: Working session at NMDIS headquarters in Tanjian China, August 30 2007. L to r: Dongmei Qi, Jixiang Chen, and Kimberly Bahl.   Middle: Working session at PICES Annual meeting Victoria Canada. October 30, 2007. L to r: Jixiang Chen, Ruguan Yin and Kimberly Bahl. Bottom: Group photo at Victoria Conference Center. L to r Kimberly Bahl, Jixiang Chen, Bernard   Megrey   and   Ruguan   Yin.
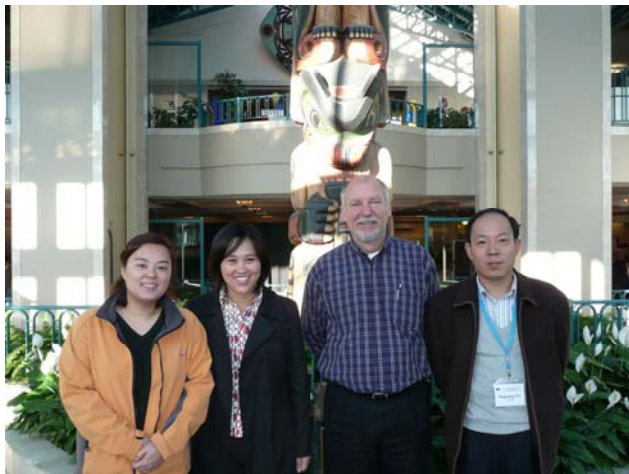
Fig. 6 The arrow points to the current PICES nodes (KODC, MIRC, NFRDI, NPEM, TINRO and NMDIS) of the Clearinghouse registry. The symbols describe connectivity statistics for all registered sites. At this time, there were 436 sites participating in the clearinghouse (not all shown).
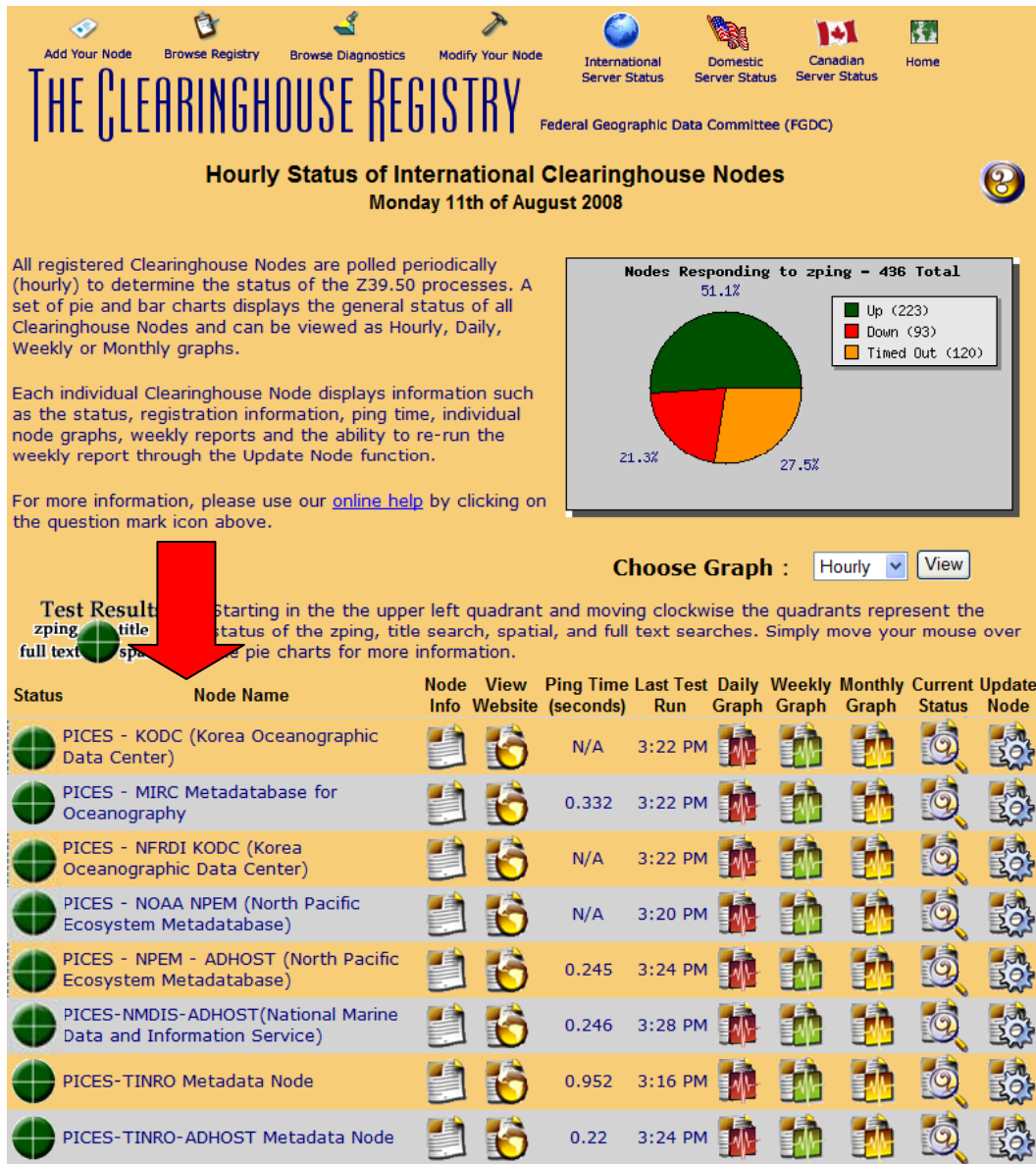
Fig. 7   The NSDI Clearinghouse Search Form. The active NMDIS node can be seen in the Server selector.