

## Report of the Technical Committee on Data Exchange

The meeting of the Technical Committee on Data Exchange (hereafter TCODE) was held from 18:00 to 20:15 on November 6 and 14:00 to 18:00 on November 9, 2016. All member countries were represented. Chinese members were not present but Ms. Fangfang Wan attended as representative of China. One member from Canada and two members from USA. were also not present. Dr. Toru Suzuki, Chair of TCODE, welcomed members and other participants to the meeting (*TCODE Endnote 1*). Dr. Suzuki reviewed the attendance record of TCODE membership from 2010–2016. He reported that Ms. Lynn M. deWitt (USA) expressed intentions to step down. Ms. Wan reported that Dr. Wenhai Lu will step down, but replacement was pending. The agenda was reviewed by members and a revised agenda was adopted (*TCODE Endnote 2*). Mr. Peter Chandler was appointed rapporteur by the Chair.

### AGENDA ITEM 3

#### **Report of POMA 2016**

Dr. Suzuki expressed regret that only 3 of 14 TCODE members had replied to his request to evaluate the 2016 POMA nominations, and that no response was interpreted to mean that he was entrusted to recommend the POMA nomination at the 2016 inter-sessional Science Board meeting in May, in Hangzhou, China

### AGENDA ITEM 4

#### **Review of procedure for Best Presentation Awards**

TCODE co-sponsored 6 topic sessions at PICES-2016, but TCODE was not the primary sponsor and was not appointed by the Science Board Chair to evaluate presenters for a TCODE Best Presentation Award.

### AGENDA ITEM 5

#### **SG-NPESR3 inter-sessional workshop and supported topic sessions/workshops in PICES-2016**

Dr. Tony Koslow presented a review of the inter-sessional Study Group on *North Pacific Ecosystem Status Report* workshop held June 28–30, 2016, in Sidney, Canada, and SG-NPESR3 business meeting on November 4, 2016.

Reviews of TCODE-supported workshops, W7 on “*Delivering quality multi-parameter data from the coastal ocean*” and W10 on “*Distribution and risk analysis of radionuclides in the North Pacific*” were briefly described by Mr. Chandler and Dr. Tomowo Watanabe, respectively. TCODE was a co-sponsor Topic Sessions S2 on “*Early life history stages as indicators and predictors of climate variability*” (TCODE Convenor: Tony Koslow) and S13 on “*Understanding the changing coastal ocean: Advances and challenges in multi-parameter observations*” (TCODE Convenor: Daisuke Ambe). Both took place after the TCODE meeting, so were unable to be reported on. TCODE also co-sponsored S7 on “*New stage of ocean acidification studies: Responses of oceanic ecosystem including fisheries resources*”, S8 on “*The Effect of marine debris caused by the Great Tsunami of 2011*”, S9 on “*Resilience, transitions and adaptation in marine ecosystems under a changing climate*” and S12 on “*Causes and consequences of 25 years of variability in ocean conditions on the Ecosystems of the North Pacific*” but had no TCODE convenor for those sessions.

### AGENDA ITEM 6

#### **Status of FUTURE**

Dr. Hiroaki Saito, Co-Chair of FUTURE SSC, and SSC liaison to TCODE, presented the status of FUTURE Phase II. He reviewed the FUTURE roadmap and indicated one of tasks for outreach by TCODE was to update

## **TCODE – 2016**

FUTURE on Wikipedia. Dr. Igor Shevchenko pointed out that TCODE has been ready to update it but no information from FUTURE SSC or expert groups has been given to TCODE. FUTURE SSC and TCODE work together to complete the task.

### **AGENDA ITEM 7**

#### **Summary of AP-NPCOOS meeting**

Dr. Sung Yong Kim, Co-Chair of AP-NPCOOS (Advisory Panel on *North Pacific Coastal Observation Systems*), presented a summary of its business meeting on November 4, including a co-sponsored workshop (W7) and topic session (S5) and anticipated products. AP-NPCOOS would like to propose a PICES summer school on “*Coastal ocean observing systems and ecosystem monitoring*” to be held in Canada (Vancouver Island) in summer 2018. Dr. Shevchenko requested AP-NPCOOS to include a lecture on using the PICES TCODE Geospatial Portal. TCODE supported the summer school proposal and will take the request to Science Board.

### **AGENDA ITEM 8**

#### **PICES data exchange policy**

Dr. Shevchenko reported that the data exchange policy drafted by TCODE was submitted to the Governing Council after ISB-2016 but that acceptance was delayed due to questions posed by the Finance and Administration Committee. Mr. Robin Brown, Executive Secretary, was invited to the Day 2 TCODE meeting, to review and discuss the policy with TCODE.

### **AGENDA ITEM 9**

#### **Relations with specific international organizations/programs**

Dr. Joon-Soo Lee provided a report with details about the work being undertaken by NOWPAP/DINRAC, IOC-WESTPAC and NEAR-GOOS.

On behalf of Mr. Jinkun Yang, Ms. Wan discussed ODINWESTPAC (Ocean Data and Information Network in the Western Pacific region) activities, one of IOC-IODE’s regional programs. WESTPAC held its 10<sup>th</sup> Conference, on “*Advancing Ocean Knowledge, Fostering Sustainable Development: from the Indo-Pacific to the Globe*”, April 17-20 in Qingdao, China, where there was a session on devoted to ocean data and information management in the Western Pacific.

Dr. Yutaka Michida, Co-Chair of IOC-IODE, reported recent progress of IOC and IODE and announced that the 24<sup>th</sup> session of IODE will be on March 27–31, 2017, in Kuala Lumpur, Malaysia. TCODE nominated Dr. Lee to represent PICES at IODE-XXIV.

### **AGENDA ITEM 10**

#### **Theme sessions for ICES 2017 ASC**

Dr. Suzuki circulated a list of proposed and pre-selected theme sessions for ICES 2017 ASC (Annual Science Conference) before the meeting. Members agreed there was no theme session of interest for TCODE to support.

## AGENDA ITEM 11

**Topic sessions and workshops of PICES-2017, Vladivostok, Russia**

Members reviewed the proposals for PICES-2017 in Vladivostok, Russia, and gave highest rank to topic sessions:

- 4-*Adverse impacts on coastal ocean ecosystems: How do we best measure, monitor, understand and predict?*
- 11-*Emerging issues in understanding, forecasting and communicating climate impacts on north pacific marine ecosystems.*

Workshops:

- 5- *A guide to communicating PICES science to scientists, governments, stakeholders and the public*
- 2- *Coastal ecosystem services in the North Pacific and analytical tools/methodologies for the assessment.*

## AGENDA ITEM 12

**Review of progress of TCODE Workplan 2015/2016**

TCODE Workplan activities for 2015/2016 (*TCODE Endnote 3*) were reviewed by members tasked for their respective items. Details can be found under relevant Agenda Items in this report.

## AGENDA ITEM 13

**TCODE Terms of Reference and Action Plan 2016-2020**

TCODE members reviewed Terms of Reference and made amendments to TORs 2 to 5, and added a sixth TOR (*TCODE Endnote 4*). Members also discussed a draft Action Plan proposed by Dr. Suzuki following a revised PICES Strategic Plan. Science Board indicated that periodic Action Plans for Standing Committees were not necessary, but that Committees could still use them as guides for activities. If posting on the web, the Plans could be updated as necessary, but the dates could be removed. TCODE Action Plan 2016–2020 will be referred as an internal document.

## AGENDA ITEM 14

**Discussion TCODE Workplan 2016/2017**

Following discussion in previous Agenda Items, TCODE adopted a revised Workplan 2016/2017 (see *TCODE Endnote 5*).

## AGENDA ITEM 15

**Summary of items with financial implications**

TCODE had no requests for financial support.

## AGENDA ITEM 16

**Presentation of country report**

Several national representatives presented brief country reports. Dr. Suzuki requested to submit documentation after the meeting immediately in order to insert them to TCODE Annual Report (*TCODE Endnote 6*).

## AGENDA ITEM 17

**Review of proposed Study Group, Working Group and summer schools**

Dr. Suzuki reviewed new proposals for one Study Group (*Marine Ecosystem Services*), two Working Groups (*Ecosystem Reference Points as Common Currency across PICES Member Countries*; *Zooplankton Production*

## TCODE – 2016

*Methodologies, Application and Measurements in the PICES Regions* [proposal for a Working Group on *Mesoscale and Submesoscale Processes* was not available for review]) and two summer schools in 2017 (“*Advanced optical survey approaches for broad-scale fishery independent surveys of fish and their habitats*” proposed by a proponent from NOAA) and 2018 (“*Coastal ocean observing system monitoring*” proposed by AP-NPCOOS). TCODE had no comments; Dr. Suzuki expressed that TCODE should support the establishment of these expert groups and summer schools, in particular the summer school in 2018, as discussed in Agenda Item 7.

### AGENDA ITEM 18

#### **Election of Chair and Vice-Chair**

Dr. Hal Batchelder, Deputy Executive Secretary, conducted elections for TCODE Chair and Vice-Chair. Dr. Joon-Soo Lee (Korea) was elected the next Chair and Mr. Peter Chandler (Canada) was elected the next Vice-Chair, replacing Dr. Suzuki and Dr. Garcia who both held two terms, at the end of PICES-2016.

### AGENDA ITEM 19

#### **Other business**

Dr. Lee recognized the very valuable contribution made by Dr. Suzuki to PICES in general, and to TCODE in particular. Everyone present applauded Dr. Suzuki and expressed their gratitude for his leadership as the Chair of TCODE.

### AGENDA ITEM 20

#### **Closing**

Dr. Suzuki closed the meeting at 18:00.

#### ***TCODE Endnote 1***

#### **TCODE participation list**

##### Members

Daisuke Ambe (Japan)  
Peter Chandler (Canada)  
Sang-Hwa Choi (Korea)  
Tony Koslow (USA)  
Joon-Soo Lee (Korea)  
Georgiy Moiseenko (Russia)  
Igor Shevchenko (Russia)  
Toru Suzuki (Japan, Chair)  
Fangfang Wan (China, on behalf of Jinkun Yang)  
Tomowo Watanabe (Japan)

##### Observers

Sun-Dae Kim (Korea)  
Sung Yong Kim (Co-Chair, AP-NPCOOS)  
Yutaka Michida (IOC-IODE)

##### PICES

Harold (Hal) Batchelder (Deputy Executive Secretary)  
Robin Brown (PICES Executive Secretary)  
Hiroaki Saito (Science Board Chair-elect;  
Co-Chair/liaison of FUTURE SSC)

##### Members unable to attend

Canada: Bruce Patten  
China: Wenhai Lu, Jinkun Yang  
USA: Lynn M. deWitt, Hernan Eduardo Garcia

**TCODE Endnote 2****TCODE meeting agenda***Day 1: Sunday, November 6*

1. Welcome and introduction of members (All)
2. Change and adoption of agenda, and nomination rapporteur (All)
3. Report of POMA 2016 (Suzuki; WP8)
4. Review of procedure for Best Presentation Awards (Suzuki)
5. Report of summary of inter-sessional workshop and supported topic sessions/workshops in PICES-2016 (AP1)
  - SG-NPESR3 inter-sessional workshop and meeting (Chandler and Koslow; WP6)
  - W7 on “*Delivering quality multi-parameter data from the coastal ocean*” (Chandler or Koslow)
  - W10 on “*Distribution and risk analysis of radionuclides in the North Pacific*” (Watanabe)
  - S2 on “*Early life history stages as indicators and predictors of climate variability and ecosystem change*” (Koslow)
  - S13 on “*Understanding the changing coastal ocean: Advances and challenges in multi-parameter observations*” (Ambe)
  - S7 on “*New stage of ocean acidification studies: Responses of oceanic ecosystem including fisheries resources*”
    - S8 on “*The effect of marine debris caused by the Great Tsunami of 2011*”
    - S9 on “*Resilience, transitions and adaptation marine ecosystems under a changing climate*”
    - S12 on “*Causes and consequences of 25 years of variability in ocean conditions on the ecosystems of the North Pacific*” (No co-convenor from TCODE for above 4 co-sponsored topic sessions)
6. Status of FUTURE (Prof. Saito, liaison for FUTURE SSC; WP5)
7. Report of summary of AP-NPCOOS meeting (Co-Chair of AP-NPCOOS or representative)
8. Report of progress of PICES data exchange policy (Shevchenko)
9. Relations with specific international organizations/programs (WP2)
  - NOWPAP/DINRAC, IOC/WESTPAC, NEAR-GOOS (Lee)
  - IOC/IODE (Prof. Michida, IODE Co-Chair)
  - IODE ODINWESTPAC (Wan or Lee)
  - ICES DIG (Suzuki but there is no information in this year)
  - Ocean surface nutrients monitoring (Suzuki but there is no information)
  - Others
10. Review of proposed theme sessions for ICES 2017 ASC

*Day 2: Wednesday, November 9*

11. Review of proposed topic sessions and workshops of PICES-2017, Vladivostok, Russia (All; WP1-2)
12. Review of progress of TCODE Workplan 2015/2016 (All)
13. Discussion TCODE Terms of Reference and Action Plan 2016–2020 (All)
14. Discussion TCODE Workplan 2016/2017 (All)
15. Summary of items with financial implications
16. Presentation of country report (representative of member countries)
17. Review of proposed Study Group, Working Group and summer schools
18. Election of Chair and Vice-Chair in triennial 2017–2019
19. Other business
20. Closing

*TCODE Endnote 3*

**TCODE Work Plan 2015/2016 (adopted on Oct. 20, 2015)**

1. Support meetings, workshops, symposia and training course/education activities (AP Goals 1, 2, 6, 7, 8 and 9)
  - 1-1. Support co-sponsored topic sessions/workshops of PICES 2016 Annual Meeting in San Diego, USA  
Responsibility – TS/WS by AP-NPCOOS, Chandler  
– TS/WS by S-CC/OA, Suzuki  
– WS by WG 30, Watanabe  
– IWS by SG-NPESR, Koslow and Chandler
  - 1-2. Propose topic sessions/workshops at PICES 2017 Annual Meeting  
Responsibility – All
  - 1-3. Propose metadata unit for inclusion in PICES sponsored training courses/summer school  
Responsibility – Shevchenko
  - 1-4. Support training course/education activities of international programme/organizations  
Responsibility – Koslow for AP-NPCOOS in 2017
2. Maintain a dialogue and collaborate with international organizations and scientific programs (AP Goal 4)  
Responsibility – Suzuki for ICES DIG  
Lee and Suzuki for IODE  
Yang for ODINWESTPAC  
Lee for NOWPAP/DINRAC  
All for new proposed SCOR WGs  
Suzuki for ocean surface nutrients monitoring
3. Strengthen communication and engagement with users of PICES scientific products (AP Goals 4 and 5)  
Responsibility – Shevchenko for HAEDAT/S-HAB, WG 21 and 29  
– Suzuki for PACIFICA/S-CC
4. Maintain and promote PICES TCODE GeoNetwork(GeoSpatial Portal) (AP Goals 4, 6, 7 and 8)
  - 4-1. Update technical report
  - 4-2. Support to register metadata of database of WG 21 on *Non-indigenous Aquatic Species*
  - 4-3. Support to register metadata of products of WG 23 on *Comparative Ecology of Krill in Coastal and Oceanic Waters around the Pacific Rim*
  - 4-4. Support to register scientific products of PICES scientific and technical committees and expert groups
  - 4-5. Renew remote server contract
  - 4-6. Continue to administer AdHost server
  - 4-7. Metadata publishing in China  
Responsibility Shevchenko in collaboration with Yang
5. Promote to use of shared information tools (AP Goals 4, 6, 10)
  - 5-1. Update FUTURE Website (pending)  
Responsibility – Shevchenko
  - 5-2. Advice using cloud/online storages  
Responsibility – Shevchenko
6. Support to development of next North Pacific Ecosystem Status Report (AP Goals 3, 5 and 10)  
Responsibility – Koslow and Chandler
7. Maintain TCODE website  
Responsibility – Shevchenko
8. POMA 2016 nomination and rank
  - 8-1. Propose new nomination by March 2016
  - 8-2. Rank/evaluate nomination(s) in April 2016  
Responsibility All
9. Revise PICES data policy  
Responsibility – Shevchenko and all
10. Support AP-NPCOOS

- Responsibility – Koslow
11. Support SG-NPESR, Intersessional WS (and new expert group)  
Responsibility – Koslow and Chandler

**TCODE Endnote 4****Proposed Terms of Reference**

(strikeout/bold indicates proposed additions/deletions)

1. Identify the data management requirements of PICES;
2. Develop ~~strategic~~ plans to meet these requirements;
3. Recommend establishment of ~~ad-hoc~~-**task expert** groups to deal with specific functions of TCODE;
4. Review the progress of ~~task~~ **expert** groups and provide Annual Reports to Science Board on the work of TCODE;
5. Advise the PICES Secretariat **and expert groups** on ~~its~~ **their** data exchange activities;
6. **Develop PICES data policies.**

**TCODE Endnote 5****TCODE Workplan 2016/2017 (adopted on November 9, 2016)**

1. Maintain a dialogue and collaborate with international organizations and scientific programs  
Responsibility – chair for ICES DIG  
– Lee for IODE, NOWPAP/DINRAC, NEAR-GOOS  
– Representative of China for ODINWESTPAC  
– All for new proposed SCOR WGs evaluation
2. Propose and support topic sessions and workshops, intersessional meetings, symposia, and training course/education activities
  - 2-1. Support co-sponsored topic sessions/workshops of PICES 2017 Annual Meeting in Vladivostok, Russia  
Responsibility – All
  - 2-2. Propose topic sessions/workshops at PICES 2018 Annual Meeting  
Responsibility – All
  - 2-3. Prepare and support PICES/AP-NPCOOS summer school 2018 hosted by Canada  
Responsibility – Shevchenko and Chandler
3. Maintain and promote PICES TCODE Geospatial Portal
  - 3-1. Update technical report
  - 3-2. Support to register metadata of database of WG-21 “Non-indigenous Aquatic Species”
  - 3-3. Support to register metadata of products of WG-23 “Comparative ecology of Krill in coastal and oceanic waters around the Pacific Rim”
  - 3-4. Support to register products of S-MBM
  - 3-5. Support to register scientific products of PICES scientific and technical committees and expert groups
  - 3-7. Continue to administer TierPoint server
  - 3-8. Metadata publishing in China  
Responsibility – Shevchenko in collaboration with representative of China
4. Support for the use of shared information technologies
  - 4-1. Maintain TCODE website  
Responsibility – Shevchenko
  - 4-2. Maintain and update FUTURE website  
Responsibility – Shevchenko

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- 4-3. Support and Advice using cloud/online storages  
Responsibility – Shevchenko and representative of China
5. Support to development of North Pacific Ecosystem Status Report III  
Responsibility – Chandler and Koslow
6. POMA 2017 nomination and rank
  - 6-1. Propose new nominations by March 2017
  - 6-2. Rank/evaluate nominations in April 2017Responsibility – All
7. Support AP-NPCOOS  
Responsibility Chandler and Koslow
8. Develop PICES data policies  
Responsibility – All

### *TCODE Endnote 6*

#### **Country Report of Canada** by Peter Chandler, DFO

There is just one member of TCODE from Canada (Mr. Peter Chandler, Vice-Chair 2017–2019). Efforts will be made to provide TCODE with another member from Canada.

The development of the PICES data policy has been deferred pending the completion of a PICES data management policy that will inventory the databases for which PICES is responsible. This work will be coordinated through the secretariat in Canada.

TCODE member, Peter Chandler, will be a representative on the Working Group on *Third North Pacific Ecosystem Status Report* (WG-NPESR3) and will coordinate the server requirements required by the WG with TCODE activities.

#### **Country Report of China** by Jinkun Yang, NMDIS/SOA

### **1. Working Progress related to TCODE’s PICES Metadata Federation Project**

Metadata records of the Chinese oceanographic stations are made to be submitted by the National Marine Data and Information Service (NMDIS). They are monthly sea level metadata records, hourly sea level metadata records, and marine meteorology wave, temperature and salinity metadata records. Details see the table below.

<b>Metadata</b>	<b>Station</b>	<b>Time period</b>	<b>No. of Records</b>
Metadata of monthly mean sea level	Dalian, Kamen, Lvsi, Zhapo, Nasha, Xisha	2015.07–2016.08	6
Hourly sea level metadata	Lianyungang, Dalian	2015.07–2016.08	2
Metadata of meteorological data, wave, temperature and salinity data	Dalian, Xiaochangshan, Yantai, Xiaomaidao, Lianyungang, Lvsi, Shengshan, Zhenhai, Dachen, Nanji, Beishuang, Dongshan, Zhelang	2015.07–2016.08	13

### **2. Data Exchange and Cooperation with Other Related International or Regional Programs**

NMDIS is the responsible body of the State Oceanic Administration (SOA), China, for international marine data and information exchange and cooperation. NMDIS has participated in a number of international and



regional programs, such as Argo, CMOC, GTSPP, NEAR-GOOS, ODINWESTPAC, ODP, *etc.* and has become an important part of international marine data and information exchange and cooperation over the years. In 2016, notable progress has been made in ODINWESTPAC and CMOC/China. The 17<sup>th</sup> Argo Data Management Meeting and the 4<sup>th</sup> IOI China Regional Center Training Course on Ocean Governance were successfully held by NMDIS.

### *2.1 Ocean Data and Information Network for the Western Pacific Region (ODINWESTPAC)*

Based on the agreement reached on the ODINWESTPAC side meeting held during WESTPAC-X (May 14, 2015, Thailand), the First Session of the Advisory Group for ODINWESTPAC was held in Tianjin, China, from January 27 to 28, 2016. The main goals of the meeting were to discuss the vision for ODINWESTPAC in the next 2 years to better facilitate the project in addressing the actual scientific needs of the WESTPAC region related to marine data and information.

NMDIS, as the host center of the project, proposed that the project focus on 5 issues in the future: (i) data products (reanalysis, forecast with special focus on WESTPAC); (ii) marine information (marine expert, institutions, marine library, *etc.*); (iii) ocean knowledge (such as the blue economy and sea level products); (iv) user-oriented services (GIS, 3D sphere); (v) data processing, quality control, and product development.

As of now, oceanographic data and marine meteorological, wave, sea surface temperature and salinity data from fixed Chinese oceanographic stations are operationally updated to August 2016. Based on the integrated ocean datasets and specialized datasets generated by ODINWESTPAC, oceanographic and marine meteorological climatic atlases of the Northwest Pacific Ocean are produced using statistical averaging methods. All of the monthly, seasonal and annual mean climatic atlases of salinity and temperature over the Northwest Pacific Ocean at each standard level have been completed. A report on impact assessment of regional sea level rise was developed to be shared with the members, and regional ocean reanalysis product datasets for 1948–2012 was produced.

### *2.2 Operational Running of CMOC/China*

Since it was officially approved by WMO and IOC in 2015, the WMO-IOC Centre for Marine-Meteorological and Oceanographic Climate Data, Tianjin, China (CMOC/China) has been focusing on WMO and IOC members' needs for high quality marine meteorology and oceanographic climate data, contributing to improve availability, rescue and archival of contemporary and historical data, metadata and products and obtaining standardized and high quality marine data and products in a more timely manner.

According to the work plan of 2015–2016 designated by the JCOMM expert team, delayed mode surface temperature and salinity data, wind-wave data, monthly mean sea level data, marine meteorological data from Chinese oceanographic stations, integrated temperature and salinity datasets of GTSPP, Argo and WOD, DBCP drifter data and metadata have been processed, quality controlled and were released in 2016.

From August 29 to September 1, 2016, the First CMOC/China Workshop was successfully held in Tianjin, China. The workshop was hosted by NMDIS, and over 30 participants from Australia, Canada, China, U.K., and U.S. presented at the workshop. The 4-day workshop reviewed the progress of CMOC/China in the past 2 years, discussed current problems in historical data rescue, collection, processing, data products R&D, regional capacity building, and exchanged views on the problems facing CMOCs in its development on regional and international level.

### *2.3 The 17<sup>th</sup> Argo Data Management Meeting and the 5<sup>th</sup> Bio-Argo Workshop*

From September 26–30, 2016, the 17<sup>th</sup> Argo Data Management Meeting and the 5<sup>th</sup> Bio-Argo Workshop hosted by NMDIS were convened in Tianjin, China. Over 70 scientists, professors and students from more than 10 countries including Australia, Canada, China, France, Germany, Italy, Japan, Korea, U.K. and U.S.

participated in the meeting and workshop. The 5-day meeting reviewed the latest development of Bio-Argo data quality control methods, discussed the progress and problems of Argo real-time and delayed-mode data processing and calibration of the member states, and proposed priorities for the Argo Data Management Team (ADMT) in the coming two years. China's active participation and contribution to the International Argo Project was welcomed by the ADMT Chairs and members.

#### *2.4 The 4<sup>th</sup> IOI-China Regional Center Training Course on Ocean Governance*

The 4th IOI-China Regional Center Training Course on Ocean Governance was organized by SOA and International Ocean Institute (IOI), sponsored by NMDIS, and implemented by IOI-China Regional Center for the West Pacific Region from August 22 to September 18, 2016, in Tianjin, China. A total of 27 participants from Cambodia, China, Indonesia, Pakistan, Papua New Guinea, Thailand, Turkmenistan and Vanuatu participated in the training course. The training course was conducted through intensive class lectures, discussion and simulation exercises, as well as field trips. A total of 27 presentations were given by 17 lecturers. The training course was organized into six modules. All the presentations were specially designed for the participants, taking into consideration their different backgrounds and needs. The presentations were focused on the teaching of general knowledge of oceanography, the United Nations Convention on the Law of the Sea and the new regime of resource exploration and exploitation on the deep seabed beyond national jurisdictions, integrated ocean and coastal management, blue economy, marine environmental protection, marine data collection, processing and quality control.

#### **Country Report of Korea**

by Joon-Soo Lee, NIFS

Major government organizations and research institutes in Korea for marine science, such as NIFS (National Institute of Fisheries Science), KMA (Korea Meteorological Administration), KHOA (Korea Hydrographic and Oceanographic Agency), and KIOST (Korea Institute of Ocean Science and Technology) are monitoring the Korean Seas for their own purposes and providing oceanographic data and information to support the national open data policy for creating new value.

The Korea Oceanographic Data Center (KODC), which is operated by the National Institute of Fisheries Science (NIFS), acts as Korea's National Oceanographic Data Center, and promoted R&D project planning for Big-data in 2016 to make the most of oceanographic data and information. KODC has also been renewing its website to provide better services, including a metadata service based on GeoNetwork open source. This work will be finished by March 2017.

#### **Country Report of Russia**

by Georgiy Moiseenko, VNIRO, and Igor Shevchenko, TINRO

In 2016, the Russian TCODE members have taken part in the following TCODE activities:

- Updating the Key Institutions/Key Persons information (Appendix 1);
- Supporting the PICES GeoNetwork portal home page (<http://67.212.128.196/geonetwork/srv/en/main.home>);
- Managing the AdHost server;
- Maintaining the TCODE web pages (<https://sites.google.com/site/picestc/>);
- Drafting a PICES data policy (<https://sites.google.com/site/picestc/data-policy>).

*Appendix 1***Key Institutions/Key Persons***PICES TCODE*

<https://sites.google.com/site/picestc/>

Igor Shevchenko

*Fisheries Institutes*

Pacific Fisheries Research Center (TINRO-Center)

<http://www.tinro-center.ru>

Igor Shevchenko

Russian Federal Research Institute of Fisheries & Oceanography (VNIRO)

<http://www.vniro.ru>

Georgiy Moiseenko

Khabarovsk Branch of Pacific Fisheries Research Center (KhOTINRO)

<http://www.tinro.khv.ru/>

Vladimir Shemyakin

Magadan Institute of Fisheries and Oceanography (MagadanNIRO)

<http://www.magadanniرو.ru>

Igor Izergin

Chukotka Institute of Fisheries and Oceanography (ChukotNIRO)

Sergey Palma

Sakhalin Institute of Fisheries and Oceanography (SakhNIRO)

<http://www.sakhniرو.ru>

Peter Vasilets

Kamchatka Research Institute of Fisheries & Oceanography (KamchatNIRO)

<http://www.kamniرو.ru/en>

Russian Federal Fisheries Agency

<http://fish.gov.ru>

Atlantic Research Institute of Marine Fisheries and Oceanography (AtlantNIRO)

<http://www.atlantniرو.ru>

Caspian Institute of Fisheries (KaspNIRKH)

<http://www.kaspnirh.ru/en/>

Polar Marine Fisheries Institute (PINRO)

<http://www.pinro.ru>

Centre for Fishery Monitoring and Communications (CFMC)

<http://www.cfmc.ru>

National Fishery Resources

<http://www.nfr.ru/en>

*Hydrometeorological Institutes*

All-Russian Research Institute of Hydrometeorological Information – World Data Center (RIHMI-WDC)  
<http://www.meteo.ru/english/>  
 Nickolay Mikhailov

State Oceanographic Institute (SOI)  
<http://www.oceanography.ru>  
 Igor Zemlyanov

Arctic and Antarctic Research Institute (AARI)  
<http://www.aari.ru/main.php?lg=1>

Far Eastern Regional Hydrometeorological Research Institute (FERHRI)  
<http://en.ferhri.org/>  
 Nikolay Rykov

*Academy of Science*

Pacific Oceanological Institute (POI)  
<http://www.pacificinfo.ru/en/>  
 Igor Rostov

Institute of Marine Biology (IMB)  
<http://www.imb.dvo.ru>

Space Research Institute (IKI)  
<http://www.iki.rssi.ru/eng/>  
 Evgeny Loupian

P.P. Shirshov Institute of Oceanology  
 of the Russian Academy of Sciences  
<http://www.ocean.ru/eng/>

**Existing Data and Metadata Sets**

<b>Agency</b>	<b>Division</b>	<b>Data/Metadata Description</b>	<b>URL</b>
Federal Service for Hydrometeorology and Environmental Monitoring	Hydrometeorological Centre of Russia	Climate temperature and precipitation data, Weather forecasts	<a href="http://wmc.meteoinfo.ru">http://wmc.meteoinfo.ru</a>
	AARI	Ice charts and forecasts	<a href="http://www.aari.ru/main.php?lg=1">http://www.aari.ru/main.php?lg=1</a>
	SOI	Hydrographic, meteorology and pollution data for Russian seas	<a href="http://www.oceanography.ru/">http://www.oceanography.ru/</a>
Russian Academy of Science	IKI	Satellite data (NOAA, GOMS, RESURS)	<a href="http://smiswww.iki.rssi.ru/">http://smiswww.iki.rssi.ru/</a>
	POI	Hydrographic observations (national and foreign) in the North Pacific	<a href="http://www.pacificinfo.ru/en/">http://www.pacificinfo.ru/en/</a>

The Russian Federal Program ESIMO portal <http://www.esimo.ru> is an entry point to sites maintaining governmental information funds of data on the state of the World Ocean and coastal areas.