

## Report of the 2016 Inter-sessional Science Board meeting

The fourteenth inter-sessional Science Board meeting took place in Hangzhou, China, from May 30 to June 1, 2016. All Science Board members were present except for BIO Chair, Dr. Angelica Peña, who was unable to attend. Seventeen Governing Council members and advisors were in attendance during the 2½-day meeting (*ISB-2016 Endnote 1*). Science Board Chairman, Dr. Thomas Theriault, called the meeting to order and welcomed the participants. After self-introductions were made, the draft agenda was reviewed by Science Board and a request from MONITOR for travel support for an invited speaker to attend the 60<sup>th</sup> anniversary conference of Line P was added to Agenda Item 16C before being adopted (*ISB-2015 Endnote 2*).

*Monday, May 30, 2016*

AGENDA ITEM 2

### Mid-year report from FUTURE SSC

FUTURE Scientific Steering Committee (SSC) Co-Chair, Dr. Steven Bograd, reported on the outcome of the FUTURE SSC's second inter-sessional meeting, held March 8–10, 2016 in La Jolla, USA. One of the aims of the SSC meeting was to review completed expert group products by linking each theme to an expert group and identifying any gaps the expert group was not addressing. The SSC also made adjustments to the SSC member liaison–expert group list.

Dr. Bograd presented the following FUTURE items for Science Board approval:

1. an updated version of how expert groups mapped onto the FUTURE social-ecological-environmental systems concept;
2. an updated FUTURE Phase II Implementation Plan;
3. the use of a FUTURE product matrix plotting expert group against each theme to show where any gaps might exist.

Suggestions were made to simplify the schematic for the Implementation Plan by removing the expert groups but to keep alternate concepts posted elsewhere that would show the mapped groups (including Advisory Panels) as they were completed, in progress, or to be expected. Drs. Bograd and Saito will work on the fuller version of the schematic, the FUTURE roadmap, and the matrix over the summer and send to Science Board for comment prior to PICES-2016.

#### **Action:**

- Drs. Bograd and Saito to work with Committees over summer to populate product matrix;
- Drs. Bograd and Saito to send updated FUTURE roadmap, matrix and unabridged schematic for comment to Science Board prior to PICES-2016.

**Recommendation:** Science Board conditionally approves FUTURE Implementation Plan Phase II pending revision of Social-Ecological-Environmental schematic and other suggestions from Science Board.

Dr. Bograd reviewed FUTURE SSC Action Plan items needing completion for 2016, which included obtaining feedback from expert groups on any issues or suggestions on how to improve SSC member liaison communications; preparing a FUTURE synthesis paper for a peer-reviewed journal; development of a template PowerPoint slide presentation for the FUTURE Mini Symposium at PICES-2016 and for distribution to the expert groups; working on development of proposals for a Working Group on “Anthropogenic Impacts on Coastal Ecosystems” and a Working Group on “Cumulative Stressors on Marine Ecosystems” and with POC and SG-CEP and SG-CERP on expert group proposals; and the identification and nomination of a Co-Chair to replace Dr. Saito before he steps down at PICES-2016.

**Actions:**

- Dr. Saito to nominate a candidate for FUTURE SSC Co-Chair from the western Pacific;
- FUTURE SSC to work on anthropogenic working group proposal with Dr. Therriault; cumulative stressor working group proposal with Drs. Perry, Di Lorenzo and King;
- FUTURE SSC to communicate with POC on preparation of submesoscale processes expert group proposal, and with SG-CEP and SG-CERP on expert group proposal;
- Dr. Therriault to circulate all expert group proposals to Science Board by end of September.

Dr. Bograd reported that three early career scientist invited speakers were confirmed for the FUTURE-sponsored Topic Session (S10) on “*The response of marine ecosystems to natural and anthropogenic forcing: Past, present and future*”, but noted that they were all from the eastern Pacific. Science Board recommended that a speaker from the western Pacific be sought. Dr. Saito agreed to contact potential speakers.

AGENDA ITEM 3

**PICES Annual Meetings**

Science Board reviewed the structure of Annuals Meetings to look at components or details that could be improved. Scheduling the FUTURE Mini-Symposium on the Sunday before the Annual Meeting has been marginally successful. Placing it in the middle of the Meeting agenda for more prominence was considered, but opinions were split whether or not it was a good idea to sacrifice concurrent sessions. An option was to use a hybrid approach where, for example, a short FUTURE presentation could be embedded at the beginning of a session. Other ideas could be to hold a 2-day FUTURE workshop and/or have a FUTURE schematic or brochure as part of the registration package.

**Action:** Committee/SSC Chairs to discuss ideas with their members on how to display and raise the prominence FUTURE and have suggestions ready by PICES-2016.

Science Board agreed that online submissions of topic session and workshop proposals would remain open up to the Science Board meeting on Friday. It was suggested that a note be added to the submissions webpage encouraging the submitter of an expert group proposal to the parent Committee(s) during the Annual Meeting in addition to contacting the other Committees to increase the chances of the proposal being accepted. The merits of invited speaker funds drawn from a common pool vs a standard allotment per Committee was debated. Science Board unanimously chose the new approach of having a common pool of funds to draw from for invited speakers vs the current standard allotment per Committee. The new model will allow Committees to focus on ranking potential speakers according to merit rather than selecting speakers according to budget, and will be flexible enough to allow for more than one invited speaker for some sessions. In this regard, The FUTURE SSC will function as a Committee (but will have its own fund). The onus will be on the Committee Chair/SSC Co-Chairs to contact the speaker, rather than the Secretariat. Online ranking of proposals by Committee/SSC members during the Annual Meeting will be closed so Committee/SSC (Co-)Chairs will need to solicit input on proposals in advance if required as final rankings will be done during Committee meetings. In accordance with previous Science Board discussions, no more than three co-convenors per session/workshop will be allowed.

**Action:** Committee Chairs/SSC Co-Chairs to provide feedback from their members on new system of prioritizing for speakers at PICES-2016.

AGENDA ITEM 4

**Status of PICES-2016, San Diego, USA**

Dr. Batchelder reviewed the status of PICES-2016. The structure for the 25<sup>th</sup> anniversary of PICES deviates from the usual Annual Meeting structure. Ten pre-Meeting workshops will be held, with three workshops being held as early as the Wednesday before the Annual Meeting. The remaining workshops will be held on

Thursday only and the majority of business meetings will take place on Friday rather than on Friday/Saturday. A full day will be dedicated on Saturday to the FUTURE SSC business meeting. More plenaries are scheduled, but there will be fewer time slots for talks. All but two sessions will be  $\frac{3}{4}$  day in duration. There will be no general paper sessions this year; instead abstracts will be presented in Contributed Poster Sessions under each Committee, except TCODE, but including S-HD, that will run from noon on Monday and all day from Tuesday to Thursday during the Meeting. Dr. Batchelder has assigned in the Meeting schedule what sessions the Committees will be responsible for judging best presentations.

**Action:**

- Sponsor Committee Chair sponsors to work with convenors to see if Tues/Thur session invited speakers are suitable/elevatable to S1 for a broader interest in S1;
- Science Board to identify plenary speakers, especially from the western Pacific, by mid-June.

AGENDA ITEM 5

**Wooster and POMA Awards**

Two nominations for the Wooster Award and one nomination for the POMA were submitted to the Secretariat by the deadline of March 31, 2016. MONITOR and TCODE provided their opinion on the POMA nomination. Science Board met *in camera* to select a recipient for each award. The recipients will be announced during the Opening Session at PICES-2016.

AGENDA ITEM 6

**Format and date for ISB-2017**

Science Board discussed ideas for ISB-2017. The FUTURE SSC will communicate with expert groups to determine if any group has a workshop planned. Otherwise the SSC will consider holding a workshop or some other event. It was noted that ISB-2017 should not conflict with the PICES/ICES Small Pelagics Symposium (March 6–11, 2016), and Dr. Saito advised that it should also avoid the end of the Japanese fiscal year (mid-March and April). The venue for ISB-2017 is pending.

**Action:** FUTURE SSC to communicate with expert groups regarding planned events over the summer.

AGENDA ITEM 7

**Mid-year reports from Scientific and Technical Committees**

Progress reports since PICES-2014 highlighting high priority items or those with financial implications of Committees and ExGs are provided below.

*Biological Oceanography Committee (BIO)*

No report. (BIO Chair, Dr. Peña, was unable to attend the meeting.)

*Fishery Science Committee (FIS)*

FIS Chair, Dr. Elizabeth Logerwell, reported that 17 selected papers, including those from S-CCME, were published in a special issue of “*Combining modeling and observations to better understand marine ecosystem dynamics*” dedicated to the memory of Dr. Bernard A. Megrey, in *Progress in Oceanography* 38, Part B: 325–584, in November 2015. Editors of the special issue were Enrique N. Curchitser, Kenneth A. Rose, Shin-ichi Ito, Myron A. Peck and Michio J. Kishi. Four papers from 3<sup>rd</sup> PICES/ICES/IOC Symposium on “*Effects of climate change on the world’s oceans*” (March 23-27, 2015, Santos, Brazil) prepared by S-CCME members were published in the May/June 2016 issue of *ICES Journal of Marine Science* 73(5). Papers resulting from

the PICES/ICES Workshop on “*Modelling effects of climate change on fish and fisheries*” (WKSICCME; August 10-12, 2015, Seattle, USA) are being considered for a peer-reviewed journal.

S-CCME held a PICES/ICES inter-sessional workshop on “*Economic modelling of the effects of climate change on fish and fisheries*” (WKSICCME\_Econ) will take place in association with MSEAS 2016 (May 30–June 3, 2016, Brest, France). A report on the workshop will be prepared by September 2016.

In modelling updates relevant to S-CCME, CERES (Climate change and European aquatic RESources) is a European-centric project that will contribute to S-CCME through involvement and cooperation with industry and policy stakeholders, and ACLIM (Alaska CLimate Integrated Modeling) is a Bering Sea climate change project funded by NOAA that will use a multi-model climate projection framework that will allow scientists to understand the implications of different sources of uncertainty in projections of climate change impacts on fish and fisheries in the Bering Sea.

Dr. Anne Hollowed is a member of the newly established Study Group on *Climate and Ecosystem Predictability* (SG-CEP) chaired by Dr. Nicholas Bond. She will seek ways to ensure that outcomes from terms of reference 2–4 will be complementary to the overarching activities of S-CCME.

The Secretariat is still working with contracting parties to identify someone from the Western Pacific to act as PICES Co-Chair for the newly established joint PICES/ISC Working Group (WG 34) on *Ocean Conditions and the Distribution and Productivity of Highly Migratory Fish*. To enhance collaboration with PICES, ISC will co-sponsor a workshop (W4) on “*Methods relating oceanographic conditions to the distribution of highly migratory species*” at PICES-2016.

#### *Marine Environmental Quality Committee (MEQ)*

MEQ Chair, Dr. Chuanlin Huo, represented PICES at NOWPAP’s 20<sup>th</sup> Intergovernmental Meeting held October 28–30, 2015, in Beijing, China, where he promoted PICES-2016 activities. NOWPAP DINRAC (Data and Information Network Regional Activity Center) is also seeking closer ties with PICES, and extended an invitation to PICES to send a representative to its Focal Points Meeting (May 26-27, 2016) in Beijing. Dr. Huo was the PICES representative.

Science Board agreed to fund the Working Group on *Assessment of Marine Environmental Quality of Radiation around the North Pacific* (WG 30) request for \$2.5k for open access publication of a paper to *Annual Reviews in Marine Science*. Science Board noted that PICES needed to develop a policy on funding for open access of publications, as the Organization cannot afford open access for every publication that could arise via PICES.

Dr. Huo requested permission to translate the book, *The Journey with PICES* into Chinese. Mr. Brown will discuss the process with Springer.

WG 30 and WG 31 (on *Emerging Topics in Marine Pollution*) were both very active, and Dr. Huo inquired if both could be continued in some form after their term expires. Science Board recommended Dr. Huo ask if these WGs had plans to continue activities, and to encourage them to submit their final reports in a timely manner so they could be included in FUTURE products.

**Action:** Dr. Huo to follow up on potential future activities with WG 30 and WG 31.

**Recommendation:** Science Board recommends funding open access fees for the publication from WG 30 in *Annual Reviews in Marine Science*, and requests Governing Council to form a policy on open access.

*Physical Oceanography and Climate Committee (POC)*

POC Chair, Dr. Kyung-Il Chang, listed membership changes within POC and its expert groups since PICES-2015: Dr. Emanuele Di Lorenzo is a new (U.S.) member of POC, replacing Dr. Enrique Curchitser; Dr. Zhongyong Gao is a new S-CC member, representing China; Prof. Yu Fei was appointed Co-Chair of the AP-CREAMS.

POC is anticipating proposals at PICES-2016 for two expert groups: POC Workshop (W8) on “*Mesoscale and submesoscale processes in the North Pacific: history and new challenges*” is expected to kick off a new working group. The Study Group on *Climate and Ecosystem Predictability* is expected to propose a new PICES/CLIVAR working group on interannual and decadal-scale predictions of ocean conditions in the North Pacific.

Canada, Korea, Russia have submitted ETSOs to the SG-NPESR. The final report of Working Group (WG 27) on *North Pacific Climate Variability and Change* is nearly complete and is expected to be submitted to POC very soon. The final report of Working Group (WG 29) on *Regional Climate Modeling* is in preparation. The editors are still waiting for reports from four contributors. Comments by the reviewers of the Supplementary Chapter for the NPESR 2003-2008 have been addressed and POC recommends the chapter for publication. A first draft of the publication on “*Oceanography of Yellow Sea and East China Sea*” associated with the EAST-II project will be ready by the end of August.

The dates are set (November 27 to December 10, 2016) for an AP-CREAMS proposed 2-week training course on “*Coastal vulnerability and freshwater discharge*” to take place at Nagoya University, Japan. Dr. Joji Ishizaka (AP-CREAMS Co-Chair) is the organizer. PICES has agreed to fund up to 5 early career scientists and 1 lecturer from PICES member countries (GC Decision 2015/S/3/iv).

*Technical Committee on Monitoring (MONITOR)*

MONITOR Chair, Dr. Jennifer Boldt, reported that Dr. Hee Yoon Park, representing Korea, replaced Dr. Young Rae Ro after PICES-2015.

The outcome of the AP-NPCOOS Workshop (W6) on “*Best practices for and scientific progress from North Pacific Coastal Ocean Observing Systems*” (Co-Convenors: Sung Yong Kim (Korea), Jack Barth (USA), Tony Koslow (USA)) at PICES-2015 is that the AP will form a small group to look at ferry box systems in each PICES member country and provide a recommendation on ecosystem EOVs (Essential Ocean Variables) for the NPESR. AP-NPCOOS also intends to hold training workshops annually that would rotate around member countries (the first is planned for 2017), and plans to develop a QA/QC flow diagram for sensors and data acquisition. AP-NPCOOS recommends that PICES extend its area of interest to include Arctic shelves to understand the connection among seas, climate change, the northward movement of fish stocks, ocean acidification, etc.

The GOOS Biology and Ecosystem Panel (GOOS-BEP) held its first face-to-face meeting at the Ocean Science Meeting in New Orleans, USA, February 19–20, 2016. The meeting was chaired by Drs. Nic Bax and Samantha Simmons. GOOS-BEP members, Drs. Sonia Batten, David Checkley, and Sanae Chiba, attended the meeting. The major goals of the meeting were to:

- Update panel activities following the DPSIR process to identify candidate EOVs (Essential Ocean Variables) for implementation at a global level;
- Review the status of existing ocean observing systems which include biological and ecological variables to identify which initiatives are realistically feasible for collection of EOVs, and discuss how GOOS-BEP could connect/engage them;
- Propose candidate biological EOVs in terms of needs, readiness and feasibility of those respective observation methods/system;
- Update work plan: identify goals, activities, challenges, strategy at short (12 months), medium (24 months), and long term (5 years).

The following EOVs were proposed during the meeting:

- Live coral cover,
- Seagrass cover,
- Macroalgal canopy cover,
- Mangrove cover,
- Harmful algal blooms (HABs) incidence,
- Phytoplankton biomass, productivity, and diversity,
- Zooplankton diversity,
- Fish abundance and distribution,
- Apex predator abundance and distribution.

Panel members were assigned to examine the feasibility and readiness of one or two candidate EOVs, depending on their respective expertise. Each member was tasked to complete specification sheets detailing information of each EOv, including existing observation projects and data sources to coordinate, by mid April 2016. The next meeting, in which the Panel will discuss how to prioritise the candidates EOVs, based on the specification sheet information, will take place in late September 2016 in Ostend, Belgium.

MONITOR has identified ~40 ETSOs from all member countries, except China, for NPESR. MONITOR members, Drs. Vyacheslav B. Lobanov (MONITOR Chair delegate on the NPESR editorial board), Sonia, Batten, Lisa Eisner, Vladimir Kulik, and Jennifer Boldt will attend the SG-NPESR workshop scheduled for June 28–30, 2016, in Sidney, Canada.

Dr. Boldt compiled reviews on the Supplementary chapter to the NPESR 2003-2008 (10 files comprised MONTOR's review) and submitted then to the authors by December 1, 2015. Upon the completion of minor edits by the authors, MONITOR supports the publication.

#### *Technical Committee on Data Exchange (TCODE)*

TCODE Chair, Dr. Toru Suzuki, reported that Dr. Wenhai Lu is a newly appointed TCODE member, representing China. TCODE member, Dr. Joon-Soo Lee (Korea), attended the NOWPAP DINRAC (Data and Information Network Regional Activity Center) Focal Points Meeting (May 26–27, 2016) in Beijing and the first session of the Advisory Group for the OIC/IODE ODINWESTPAC (January 27–28, 2016) in Tianjin, China. Dr. Suzuki is an Associate Member (not funded by PICES) of SCOR Working Group (WG 148) on *International Quality Controlled Ocean Database: Subsurface Temperature Profiles*.

Dr. Igor Shevchenko presented an overview of a draft PICES data exchange policy that is being developed by TCODE as a prerequisite for applying as an associate data unit (ADU) to IODE. A final draft will be submitted to Science Board for comments prior to PICES-2016. As this is a policy document, it was strongly suggested that Science Board and Governing Council should work together on it before submitting it to F&A for comment prior to PICES-2016.

**Recommendation:** Science Board requests Governing Council aid in formulating a PICES data policy.

*Tuesday, May 31, 2016*

#### AGENDA ITEM 8

#### **Mid-year reports from expert groups that report directly to Science Board**

##### Section on *Human Dimensions of Marine Systems* (S-HD)

Drs. Keith Criddle (Co-Chair) and Ron Felthoven are leading a Sub-team to collect human dimensions indicators from PICES member countries. Ms. Juri Hori has completed a web-based well-being survey in

Canada and Russia and now all member countries have been covered. The survey is being done as part of the MarWeB project. The next step will be to analyze the data. Dr. Criddle and Co-Chair, Dr. Mitsutaku Makino, have been deeply involved in preparations for MSEAS 2016, which is taking place May 30-June 3, 2016.

Study Group on *Common Ecosystem Reference Points across PICES Member Countries* (SG-CERP)

Dr. Elliott Hazen was appointed Study Group Chair at the end of April. No report was expected or provided.

Study Group on *Climate and Ecosystem Predictability* (SG-CEP)

Dr. Nicholas Bond was appointed Study Group Chair at the end of April. No report was expected or provided.

Study Group on *North Pacific Ecosystem Status Report* (SG-NPESR3)

Science Board agreed to wait until SG-NPESR3 has its workshop on June 28–30, 2016 to better understand what the intentions are for an editorial board to appraise and provide quality control of ETSOs and timelines for submitting data.

**Action:** Secretariat to circulate SG-NPESR report to Science Board prior to PICES-2016.

#### AGENDA ITEM 9

##### **Review of PICES Standing Committees**

With the approach of PICES' 25<sup>th</sup> anniversary, Dr. Therriault noted it would be an opportune time for Science Board to review the responsibilities and focus of their Standing Committees and make adjustments to amend any gaps in scientific activities. Dr. Therriault will assist in reviewing terms of reference with the Committee Chairs. Most Committees have shown a range of attendance across years and Science Board unanimously agreed that it could be improved. As an example, Science Board was encouraged to read the article by Dr. Shoshiro Minobe in PICES Press (Vol. 22, No. 2, [pp. 6–8](#), 2014) on challenges and strategies to recruiting motivated researchers to membership. GC member, Dr. John Stein emphasized that if certain Committee members were unable to attend an Annual Meeting, their country delegate would be responsible for assigning someone to sit in for the member.

Science Board unanimously agreed that the Section on *Human Dimensions of Marine Systems* (S-HD) should be elevated to a Committee level. Dr. Therriault will communicate with the S-HD Co-Chairs to obtain their opinion about change in status. Outcome and details will be discussed at PICES-2016.

##### **Action:**

- Each Committee to summarize 3 or 4 important scientific elements and 2 or 3 challenges/gaps for discussion at PICES-2016;
- Dr. Therriault to work with Secretariat to standardize the format of terms of reference for Committees.

#### AGENDA ITEM 10

##### **Proposed new expert groups**

Proposal for a Working Group on *North Pacific Ecosystem Status Report Synthesis* (ISB-2015 Endnote 3)

Science Board recommended, by a small majority, to establish a Working Group on *North Pacific Ecosystem Status Report Synthesis* immediately rather than wait for the outcome from the workshop of SG-NPESR3 (June 28–30, 2016, Sidney, Canada). Science Board felt it important that the next iteration of a North Pacific Status Report be completed as soon as possible and establishing the working group early would avoid potential delay. Science Board will work with SG-NPESR3 after the workshop to nominate members.

**Recommendation:** Science Board recommends establishment of WG-NPESR3, with MONITOR and FUTURE as parents.

Proposal for an Advisory Panel on *Aquatic Non-indigenous Species* (AP-NIS)

Science Board unanimously recommended the establishment of an Advisory Panel on *Aquatic Non-indigenous Species*, pending a minor change in term of reference #6 from “Prepare regular reports on accomplishments” to “Publish regular reports on accomplishments” (*ISB-2015 Endnote 4*).

**Recommendation:** Science Board recommends establishment of an Advisory Panel on *Aquatic Non-indigenous Species* with MEQ.

AGENDA ITEM 11

**PICES Publications requiring Science Board approval**

a) Publications requiring Science Board approval

Science Board recommended publication of:

- Report on Spatial ecology of marine top predators in the North Pacific by the Advisory Panel on *Marine Birds and Mammals*
- Final Report of the Working Group 26 on *Jellyfish Blooms around the North Pacific Rim: Causes and Consequences*
- Final Report of the Study Group on *Biodiversity Conservation*
- Supplementary Chapter to the North Pacific Ecosystem Status Report 2003–2008 as a special publication pending modifications to shorten the foreword and delete appendices not relevant to scientific content.

Reports in preparation:

- Final Report of the Working Group 27 on *North Pacific Climate Variability and Change*
- Final Report of the Working Group 28 on *Development of Ecosystem Indicators to Characterize Ecosystem Responses to Multiple Stressors*
- Final Report of the Working Group 29 on *Regional Climate Modeling*  
-in development, anticipated by PICES-2016
- Report on “Oceanography of the Yellow and East China Seas (EAST-II region)” by the Advisory Panel for a *CREAMS/PICES Program in East Asian Marginal Seas*
- Final Report of the Study Group on *Socio-Ecological-Environmental Systems*

b) Publication of Scientific Report series

An impromptu survey of Committees prior to ISB-2016 to determine member interest in receiving hard copies of publications from the Scientific Report series was inconclusive due to the small sample size. Responses ranged from “not necessary” to “yes, would like to receive for member/or for students”. Science Board will revisit the issue at PICES-2016.

**Action:** Committee Chairs to re-canvas their members and have numbers ready for PICES-2016.

AGENDA ITEM 12

**Implementation of Science Board recommendations and Governing Council decisions from PICES-2015**

Executive Secretary, Mr. Robin Brown, reported that some Arctic-focused organizations will be attending PICES-2016 to discuss Arctic-based activities with PICES (see Decision 2015/S/1). Issues to follow up on: ICES Co-Chair for the joint PICES-ICES Working Group on *Climate Change and Biologically-driven Ocean Carbon Sequestration* (WG 33) and PICES Co-Chair for the joint PICES-ISC Working Group on *Oceanographic Conditions and the Distribution and Productivity of Highly Migratory Fish* (WG 34) have not been finalized; Mr. Brown will follow up with SG-NPESR3 Chair, Dr. Phillip Mundy, on term of reference, “The SG will report to ISB-2016 on options for biogeographical classification of data submitted to NPESR3, including a recommendation on a preferred approach”.

**Action:** Secretariat to communicate with Dr. Mundy on GC decision S/6/viii.

AGENDA ITEM 13

**PICES 25<sup>th</sup> Anniversary**

Items in progress for the celebration of PICES' 25<sup>th</sup> anniversary include:

1. Redesign and recoding of all web pages on the PICES website migrated to a new server. The website is now designed to be mobile-friendly;
2. PICES photo album of people and events during PICES' first 25 years. Final version will be available electronically and in hard copy;
3. Video production of interviews with a selection of PICES members;
4. PICES history timeline to be published on the web and available as a poster;
5. Hard copy book "Journey with PICES" to be published by Springer (being finalized); the book will be part of the PICES-2016 registration package;
6. Lecture series – a number of options are being considered (as a presentation at the Early Career Scientist Conference in Busan, Korea; slide presentations based on a set of themes, to be prepared by theme leaders, and posted on the web);
7. Selected papers from the Science Board Symposium to be published in a special issue of a peer-reviewed journal TBD;
8. A redesigned PICES logo.

AGENDA ITEM 14

**Status of planning for PICES-2017**

Dr. Igor Shevchenko presented a PowerPoint on the theme "*North Pacific biological resources in the changing environment*" for the next Annual Meeting which will take place in Vladivostok, Russia. The exact dates have not been fixed, but the meeting will take place in late October. Dr. Shevchenko requested Science Board provide feedback on the theme and on the various aspects related to it, as posed in the presentation. In the interest of time, Dr. Therriault volunteered to develop an abstract which could be further discussed by correspondence after ISB-2016.

**Action:** Dr. Therriault to communicate with Science Board by email to finish preparing theme for PICES-2017.

AGENDA ITEM 15

**Updating the PICES Strategic Plan**

Dr. Laura Richards briefly reviewed a revised PICES Strategic Plan which will be released at PICES-2016. The Plan has a more contemporary look, improved graphic design, and clear strategic concepts with no Action Plans. The Plan is considered to be in its final stage, and Science Board was asked to notify Governing Council only if there was an obvious omission or error.

AGENDA ITEM 16A

**Interactions with other organizations**

***Current and potential strategic collaborations***

1. *ICES (International Council for the Exploration of the Sea)*

Changes in key ICES positions are taking place in 2016. Dr. Adi Kellermann (ICES Head of Science) will retire and Yvonne Walther's term as SCICOM Chair will end. Dr. Cornelius Hammer is the new president of ICES. For the past couple of years, PICES has been relying on informal *ad hoc* meetings at ICES ASCs to discuss current and future PICES-ICES collaborations, so ties will need to be re-established with incoming people to maintain continuity.

2. *NPAFC (North Pacific Anadromous Fish Commission)*

Dr. Richards represented PICES at the 2<sup>nd</sup> International Year of the Salmon (IYS) Scoping Meeting in Vancouver, Canada on March 15–16, 2016. An IYS plan will be to conduct a 7-year research program focused on salmon and their relation to people. The purpose of the meeting was to bring together potential research partners and funders to develop a business plan for the program. All NPAFC member countries and a number of organizations, agencies and academia were represented at the meeting. The program is anticipated to start in 2017.

3. *NOWPAP (Northwest Pacific Action Plan)*

Dr. Huo reported that the NOWPAP Regional Coordinating Unit (RCU) and the four regional activity centres (RACs) are keen to collaborate with PICES, but the specific mechanisms for this have not been resolved yet. Mr. Brown noted that the Secretariat will need to work closely with NOWPAP's RCU and RACs to coordinate PICES participation, likely relying heavily on western Pacific members to attend meetings.

4. *ISC (International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean)*

See Agenda Item 12.

5. *CLIVAR (Climate Variability and Predictability Project of the World Climate Research Program)*

PICES and CLIVAR are starting to work together to explore strategic opportunities for collaboration. CLIVAR will hold an Open Science Conference on “*Charting the course for climate and ocean research*” September 18–25, 2016, in Qingdao, China. PICES is providing travel support for Dr. Nicholas Bond (SG-CEP Chair) and four early career scientists to attend the conference.

6. *NPFC (North Pacific Fisheries Commission)*

NPFC held its first Scientific Committee meeting April 25–27, 2016, in Tokyo. The Secretariat has been in contact with NPFC, and it appears that the Commission is keen to work with PICES once it settles into its role.

AGENDA ITEM 16B

**The 4<sup>th</sup> Climate Change Symposium**

Following PICES-2015 Dr. Therriault asked Science Board to identify potential nominees for PICES convenor and SSC members so planning could commence for the 4<sup>th</sup> International Symposium on the “*Effects of climate change on the world's oceans*” to be held in 2018 in the USA. As nominees were lacking at ISB-2016, Dr. Therriault indicated this would be done through correspondence to give Science Board more time.

**Action:** Science Board to provide 2-3 names for a convenor and 4-6 names for SSC members by the end of June.

AGENDA ITEM 16C

**PICES-sponsored conferences/symposia in 2015 and beyond**

*PICES/ICES 6<sup>th</sup> International Zooplankton Production Symposium*

Dr. Batchelder reported that the Symposium, held May 9–13, 2016, in Bergen, Norway, was successful, with close to 400 scientists in attendance. Close to half of the participants were early career scientists. PICES supported 25 early career scientists, including 3 from funds provided by SCOR.

ICES Symposium on “*Understanding marine socio-ecological systems: including the human dimensions in Integrated Ecosystem Assessments*”

The Symposium was taking place concurrently (May 30–June 3, 2016) with ISB-2016, so there was no report on outcome. Section on *Human Dimensions of Marine Systems* Co-Chair, Dr. Keith Criddle, represented PICES as an SSC member for the symposium.

PICES/ICES Symposium on “*Drivers of dynamics of small pelagic neritic fish resources*”

The symposium will take place March 6-11, 2017 in Victoria, Canada, and is being coordinated by Drs. Alexander Bychkov (PICES) and Adolf Kellermann (ICES).

### ***Proposals for PICES co-sponsorship***

#### 1. US CLIVAR Workshop on “*Forecasting ENSO impacts on marine ecosystems of the US West Coast*”

Prior to ISB-2016, the Secretariat, in consultation with the Science Board Chair, agreed that PICES would provide travel support for Dr. Nicholas Bond (Chair SG-CEP) to attend the workshop. No action was required by Science Board.

#### 2. ICES workshop on ocean acidification on fisheries

This workshop was still being developed by ICES so no documentation was available for Science Board review, but *ad hoc* discussions took place between ICES representatives and PICES, which were presented to Science Board. The workshop will take place after the ICES ASC [later determined to be December 5–16, 2016, in Copenhagen, Denmark]. Science Board agreed to support up to 3 scientists, including Dr. Tsuneo Ono as workshop convenor.

**Recommendation:** Science Board recommends that PICES support the ICES Workshop on ocean acidification on fisheries and requests funding for a convenor and up to 2 scientists to attend.

**Action:** Dr. Therriault and Mr. Brown to work with ICES to add Tsuneo Ono as convenor.

#### 3. 3<sup>rd</sup> ESSAS Open Science Meeting

Science Board agreed to provide support for keynote speakers and early career scientists from the North Pacific region to attend ESSAS’s 3<sup>rd</sup> Open Science Meeting (June 11-15, 2017, Tromsø, Norway). The amount of funding will be determined at PICES-2016, when other proposals have been tabled.

**Recommendation:** Science Board recommends that PICES support the ESSAS Open Science Meeting, in principle.

#### 4. Station Papa’s 60th Anniversary Celebration Symposium

Science Board unanimously agreed to provide partial travel support for 2 invited speakers (one from the eastern Pacific and one from the western Pacific) to attend Station Papa’s 60th Anniversary Celebration Symposium (December 2016, location TBD, Canada).

**Recommendation:** Science Board recommends PICES support of up to 2.5k for 2 invited speakers to attend Station Papa’s 60<sup>th</sup> Anniversary Celebration Symposium.

Wednesday, June 1, 2016

AGENDA ITEM 16D

**Capacity building**

1. *PICES/ICES Early Career Scientist Conference*

Dr. Batchelder (PICES) and Dr. Wojciech Wawrzynski (ICES) are the co-ordinators of the PICES/ICES Early Career Scientist Conference on “*Climate, oceans and society: Challenges and opportunities*” (May 30–June 2, 2017, Busan, Korea). Conference brochures are being prepared and will be mailed to several organizations or meetings for further distribution by end of July.

2. *PICES Summer School*

Dr. Logerwell presented a proposal on behalf of Dr. Elizabeth Clarke (Northwest Fisheries Science Center) for a PICES Summer School on “*Advanced survey approaches for broad scale fishery independent surveys of fish and their habitat*”. The venue will be Friday Harbor, Washington or USC Wrigley Institute for Environmental Studies, Los Angeles, California. Science Board supported the proposal in principle, and will wait until further details at PICES-2016.

**Recommendation:** Science Board recommends hosting a PICES Summer School on “*Advanced survey approaches for broad scale fishery independent surveys of fish and their habitat*”, in principle, to take place in North America.

3. *Summer schools co-sponsored by PICES*

No proposals submitted.

4. *Training courses*

A 2-week International Hydrological Programme (IHP) training course on “*Coastal vulnerability and freshwater discharge*” [formerly named “*Freshwater discharge and the coastal environment*”] will be held November 27–December 10, 2016, at Nagoya University, Japan. The course organizer, Dr. Joji Ishizaka, will work with the Secretariat to identify one lecturer and 5 early career scientists for PICES support.

AGENDA ITEM 16E

**Other interactions with international organizations**

1. *SCOR (Scientific Committee on Oceanic Research)*

Of the eleven SCOR working group proposals submitted to SCOR for 2016, P10 “Eastern Boundary Upwelling Ecosystems (EBUE): inter-comparisons, variability and forecasting responses to climate and global change” was common to all Science Board responses for PICES affiliate status support. This choice will be conveyed by Dr. Batchelder to SCOR.

2. *IMBER Integrated Marine Biogeochemistry and Ecosystem Research)*

3. *SOLAS (Surface Ocean – Lower Atmosphere Study)*

No requests or proposals were provided to Science Board at this time.

#### 4. *UN World Ocean Assessment*

Mr. Brown reported that the [World Ocean Assessment I \(WOA\)](#) has been approved by the UN and is now available online. Dr. Therriault was the author of [Chapter 36C](#), which drew heavily from NPESR, and Drs. Chul Park and Jake Rice were the editors of Part VI. At the request of the Bureau of the Ad Hoc Working Group of the Whole on the Regular Process, Mr. Brown provided detailed PICES feedback on “lessons learned” regarding the first cycle of the Regular Process for WOA, and anticipates hearing IOC responses when he attends the 49<sup>th</sup> Session of the IOC Executive Committee (June 6–10, 2016, Paris, France). Science Board acknowledged that PICES exposure in the WOA was beneficial but there were drawbacks of investing in the Process, citing the UN’s current approach of drawing only experts from member nations rather than recognizing experts from organizations. Dr. Park will attend the IOC meeting and advocate for PICES to be regarded as part of the pool of experts. Science Board agreed that PICES should continue contributing to the WOA and that PICES citable literature should be encouraged. Mr. Brown will prepare a time series of products that could be applied to the second iteration of the WOA.

**Action:** Mr. Brown to prepare a time series of products to be applied to WOA2.

#### 5. *IOC-Global Ocean Observing System (GOOS)*

See MONITOR’s report in Agenda Item 7.

#### 6. *IOC/SCOR – GlobalHAB*

Science Board agreed that PICES involvement in GlobalHAB was relevant to PICES’ interests, and that PICES should have full representation in the GlobalHAB SSC.

**Action:** Mr. Brown to communicate with GlobalHab SSC Chair, Dr. E. Berdalet, to get PICES representation on the SSC.

#### 7. *Pacific Ecology and Evolution Conference (PEEC)*

Dr. Therriault noted that this was the second year PICES provided support to PEEC. He encouraged Science Board members to look at other small-scale early career scientist events in their countries, especially on the western Pacific side, that PICES could support.

##### *a) Potential collaborations*

Science Board agreed that Future Earth was strategically important and should be engaged with. Not enough information was known about the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IBPES) for Science Board to determine if strategic collaborations could prove beneficial. More information on the two organizations may be available at PICES-2016.

**Action:** Mr. Brown to contact

- Future Earth representatives to ask them to focus on strategic issues with PICES;
- Dr. Manuel Barange (FAO) to get perspective on IBPES.

##### *b) Organizing collaborations*

Mr. Brown presented a list of organizations PICES has or is currently dealing with, and an arbitrary tier ranking according to how active they have been in collaborations for Science Board review. Due to time constraints, Science Board deferred discussions to PICES-2016.

**Actions:**

- Mr. Brown to circulate a new version to Science Board by end of June;
- Science Board to circulate to their Committees for 1) comments on tiers and trend, and 2) any additions to the list for discussion at PICES-2016

AGENDA ITEM 17

**Next integrative science program**

Dr. Therriault requested Science Board to consider what type of program, if any, would replace FUTURE, which is now past its midlife. A range of options were briefly discussed. Further discussions will continue over the summer and the topic will be re-visited at PICES-2016.

**Action:** Science Board members to re-visit at PICES-2016.

AGENDA ITEM 18

**Other PICES business**

none

***ISB-2015 Endnote 1***

**ISB-2016 participation list**

Members

Steven Bograd (Co-Chair, FUTURE SSC)  
Jennifer Boldt (Chair, MONITOR)  
Kyung-Il Chang (Chair, POC)  
Chuanlin Huo (Chair, MEQ)  
Elizabeth Logerwell (Chair, FIS)  
Angelica Peña (Chair, BIO) (absent)  
Hiroaki Saito (Chair-elect, Science Board;  
Co-Chair, FUTURE SSC)  
Igor Shevchenko (representing Russia)  
Toru Suzuki (Chair, TCODE)  
Thomas Therriault (Science Board Chair)

Governing Council

Lev Bocharov (Russia)  
Jinqiu Du (advisor, China)  
Enrique Curchitser (Governing Council, USA)  
Takashi Ikeda (Advisor, Japan)  
Shigeru Itakura (Japan)  
Carmel Lowe (Canada)  
Man Wook Heo (Korea)  
Hyun Yeong Kim (Advisor, Korea)  
Kyungjin Kim (Advisor, Korea)  
Jae-Ho Lee (Advisor, Korea)  
Noritsugu Takahashi (Japan)  
Fangli Qiao (China)  
Igor Shevchenko (Advisor, Russia)  
John Stein (USA)  
Haiwen Zhang (China)  
Rui Zheng (advisor, China)

PICES

Laura Richards (PICES Chair)  
Chul Park (PICES Vice-Chair)  
Robin Brown (Executive Secretary)  
Harold (Hal) Batchelder (Deputy Executive Secretary)  
Rosalie Rutka (Administrative Assistant)

*ISB-2015 Endnote 2*

**ISB-2016 meeting agenda**

*Monday, May 31, 2016*

1. Welcome and adoption of agenda
2. Mid-year report from FUTURE SSC
3. PICES Annual Meetings
4. Status of PICES-2016, San Diego, USA
5. Wooster and POMA awards
6. Format and date for ISB-2017
7. Mid-year reports from Scientific and Technical Committees

*Tuesday, May 31, 2016*

8. Mid-year reports from expert groups that report directly to Science Board
9. Review of PICES Standing Committees
10. Proposed new expert groups
11. PICES Publications requiring SB approval
12. Implementation of Science Board recommendations and Governing Council decisions from PICES-2015
13. PICES 25<sup>th</sup> Anniversary
14. Status of planning for PICES-2017
15. Updating the PICES Strategic Plan
16. Interactions with other organizations
- 16A. Current and potential strategic collaborations

*Wednesday, June 1, 2016*

- 16B. The 4<sup>th</sup> Climate Change Symposium
- 16C. PICES-sponsored conferences/symposia in 2015 and beyond
- 16D. Capacity building/Plan for PICES summer schools
- 16E. Other interactions with international organizations
17. Next integrative science program
18. Other PICES business

***ISB-2015 Endnote 3***

**Proposal for a Working Group on North Pacific Ecosystem Status Report Synthesis**  
(submitted March 18, 2016)

Term: May 2016 – Nov 2017

Acronym: WG-NN

Parent Committees: MONITOR, TBD

Co-Chair: TBD

Co-Chair: TBD

Membership: TBD

**Motivation**

WG-NN conducts the synthesis of the foundational Environmental Time Series Observations, ETSOs. According to the schedule and duties described in the [NPESR Implementation Plan](#) (Qingdao, October 2015), the working group will coordinate and communicate with the SG-NPESR, the NPESR Editorial Board, and other concerned parties to effect an orderly transition of duties as the work of the SG is concluded after the 2016 PICES Annual Meeting.

Following PICES Annual Meeting in 2016, the WG-NN will work with the Editorial Board and the authors of the individual ETSOs to develop regional syntheses, culminating in a North Pacific synthesis. Following production of the NP synthesis, the WG-NN will serve as editors for the AFSC REEM as it produces the regional sections and the regional sections are combined into a web published NPESR. At the pleasure of the Editorial Board, the Science Board and Governing Council, the WG-NN may participate in developing and producing NPESR publications in other formats. For definition of items listed in the terms of reference and more precise scheduling information please refer to the Third Ecosystem Status Report [Implementation Plan, IP-NPESR \(16 Oct 2015\)](#).

**Proposed Terms of Reference**

1. Consult with the Editorial Board and SG-NPESR on the selection of authors to be included in the NPESR;
2. Lead the authors of the NPESR in regional synthetic analyses of trends in ETSOs of the individual North Pacific ecosystems as determined by the WG-NN in consultation with the Editorial Board and the Science Board;
3. Convene the North Pacific Synthesis Workshop (2017) to include the working group members and the authors of the ETSOs to develop an overarching synthesis of North Pacific Ecosystems in formats to be determined by WG-NN, the Editorial Board, and the Science Board;
4. Work with the Editorial Board (or its designees) to edit sections of the NPESR as they are produced;
5. Lead the production of the third North Pacific Ecosystem Status Report in cooperation with AFSC REEM.

***ISB-2015 Endnote 4***

**Proposal for an Advisory Panel on *Aquatic Non-indigenous Species* (AP-NIS)**

**Background**

As early as PICES' Thirteenth Annual Meeting (2004, Honolulu, USA), the importance of understanding the impact of transport processes on species distribution in the North Pacific was noted when MEQ held a Topic Session, co-sponsored by ICES, on "*Natural and anthropogenic introductions of marine species*". Discussions at that session called for the establishment of a PICES working group, which would work closely with ICES invasive species working groups. At the following Annual Meeting in 2005 (Vladivostok, Russia), an MEQ Workshop, co-sponsored by ICES, on "*Introduced species in the North Pacific*" kicked off the Working Group on *Non-indigenous Aquatic Species* (WG 21). The importance of non-indigenous aquatic species was further emphasized at PICES' Sixteenth Annual Meeting when it was announced that the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan would fund a 5-year project (2007–2012) on the "*Development of the prevention systems for harmful organisms' expansion in the Pacific Rim*". One component of this project was

on marine non-indigenous species (MNIS) and WG 21 was tasked to develop a comprehensive database and Atlas of MNIS of the North Pacific.

Since marine NIS represent a current and persistent risk to PICES member countries, the NIS database and other accomplishments of WG 21 have positioned PICES to better comprehend and advance marine NIS topics, including emerging vectors (*e.g.*, vessel biofouling, tsunami/marine debris), altered species distributions, risk assessment, and interactions/impacts on marine ecosystems (including structure, function, productivity, and resilience). There is also a strong linkage to FUTURE and to the North Pacific Ecosystem Status Report, and there is considerable interest about how projected global climate change will affect the introduction, spread and impacts of NIS in the North Pacific so risk identification can be undertaken to inform potential mitigation measures by PICES member countries. ICES and NOWPAP are also interested in identifying specific NIS vectors or taxa of common interest to PICES member countries. At the end of its term, WG 21 looked at several options for PICES' continued involvement in aquatic NIS, and recommended that an Advisory Panel on *Aquatic Non-indigenous* be established.

Suggested parents: MONITOR and/or BIO

#### Proposed Terms of Reference

1. Continue to share information on aquatic non-indigenous species (NIS) in the North Pacific *via* an updated NIS database;
2. Exchange information on updated regulations/policy, best practices for monitoring, early detection, rapid response, and control/containment options;
3. Develop a better understanding of changing distributions of NIS and invasion pathways and vectors in the context of global climate change including expected changes in water temperature, salinity, oxygen, and  $p\text{CO}_2$ ;
4. Plan workshops/sessions/symposia related to NIS topics. (For example a joint PICES/ICES Theme Session on “The increasing importance of biofouling for marine invasions: an ecosystem altering mechanism” was held at the 2014 ICES Annual Science Conference.);
5. Work with other international, intergovernmental organizations (*e.g.*, ICES, NOWPAP and WESTPAC) and/or countries to accomplish these terms of reference, especially those related to data/information exchange;
6. Prepare regular reports on accomplishments.