

PICES Annual Meeting, Qingdao, China
FIS Meeting Agenda
Sunday, October 18, 2015, 18:00 – 20:00
Tuesday, October 20, 2014, 14:00 – 18:00

Chairman: Libby Logerwell (U.S.A.)

Vice-Chairman: Xianshi Jin (China)

October 18

- 1) Welcome of new members, introductions, and nomination of a rapporteur
 - a) New members
 - i) Dr. Tetsuichirou Funamoto (Japan)
 - ii) Dr. Masahito Hirota (Japan)
- 2) Adoption of agenda
- 3) Volunteers for Award Committees for 2015
 - a) FIS Best Presentation Award
 - b) FIS Best Poster
- 4) FIS Chairman's Report
- 5) Update on FUTURE Activities
 - a) FIS Chair report on FUTURE mini-symposium
 - b) FUTURE SSC liaison update on FUTURE, Sukyung Kang

October 20

- 6) Status Reports of S-CCME: Joint PICES/ICES Section on "Climate Change Effects of Marine Ecosystems", Anne Hollowed
 - a) WKSICCME Report
 - b) Review Goals in light of new FUTURE structure. *See Appendix I "S-CCME Goals"***
Action Item: Suggest updates/revisions to S-CCME Goals
- 7) Relations with other programs and organizations
 - a) ICES ASC 2016 list of theme sessions for PICES co-sponsoring (TBD)
Action Item: Which theme sessions does FIS recommend PICES supports?
 - b) SCOR Working Group Proposals. *See Appendix II "SCOR Working Group Proposals"*

Action Item: Assign "must fund", "may fund" or "do not fund" rating for each proposal

- c) ISC-PICES Framework for Scientific Cooperation in the North Pacific (Jackie King). **See attached SG-SCISC.Framework.doc**

Action Item: Does FIS support the Framework? Suggest revisions, if necessary

- d) Observers

- i) Ecosystem Studies of Sub-Arctic Seas (ESSAS), Franz Mueter, Ken Drinkwater or Sei-ichi Saitoh. Oral presentation.
- ii) International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC), Chi-lu Sun. No presentation.
- iii) North Pacific Anadromous Fish Commission (NPAFC), Loh-Lee Low. Oral presentation.
- iv) North Pacific Fishery Management Council (NPFMC), Gordon Kruse. No presentation.

Action Item: Does FIS endorse the Observers' requests for PICES financial support or other involvement?

- 8) PICES 2016 25th Anniversary

- a) San Diego, USA, from November 1-13, 2016. The theme is "25 Years of PICES Celebrating the Past, Imagining the Future".
- b) FIS committee rankings of Topic Sessions and Workshops.
 - i) Please review and rank proposals online before our meeting. Proposers are encouraged to submit proposals online before September 25. The online system closes on October 19. We will review any later submissions during the FIS meeting.
 - ii) Please review all proposals, but that the conveners of the two session proposals below requested FIS sponsorship
 - #3 Early Life History Stages as Indicators and Predictors of Climate Variability and Ecosystem Change (convener Ric Brodeur)
 - #2 Species Adaptation to Climate Change (convener Lorenzo Cianelli)

Action Item: Which proposals does FIS support? Suggest revisions to proposals, if necessary

- 9) Proposals for new FIS Working Groups, Study Groups and Special Projects

- a) SG Ecosystem reference points as a common currency across PICES social-ecological systems, Elliot Hazen or Jameal Samhuri.

Action Item: Does FIS support the new SG? Suggest revisions to proposal, if necessary

- b) PICES-ISC Working Group on Oceanographic Conditions and the Distribution and Productivity of Highly Migratory Fish, Jackie King. **See Appendix III "Proposed Joint PICES-ISC Working Group...":**

Action Item: Does FIS support the new WG? Suggest revisions to proposal, if necessary

- 10) Proposals for new meetings/workshops/conferences with PICES as co-sponsor

- a) “Species on the Move International Conference”, Hobart Tasmania. Conference sponsors: University of Tasmania and Institute for Marine and Antarctic Studies (<http://www.speciesonthemove.com/>). **See Appendix IV “Species on the move letter.doc”**

Action Item: Should PICES support this conference?

11) High priority projects and activities with financial/policy implications

- a) Report from SG-NPESR, Jaebong Lee **See Appendix V “NPESR Draft Implementation Plan”**

Action Item: Does FIS endorse the NPESR Implementation Plan?

12) Priority items with funding implications (meetings/workshops/conferences)

13) Proposed publications (PICES Scientific Report series and primary journals)

14) Intersessional activities and meetings, travel support requests

15) Other business

Appendix I “S-CCME Goals”

Goals:

- Define, coordinate and integrate the research activities needed to understand, assess and project climate change impacts on marine ecosystems;
- Plan strategies for sustaining the delivery of ecosystem goods and services, and when possible predictions should include quantifying estimations of uncertainty;
- Define and quantify the vulnerability and sustainability of marine ecosystems to climate change, including the cumulative impacts and synergetic effects of climate and marine resource use;
- Build global ocean prediction frameworks, through international collaborations and research, building on ICES and PICES monitoring programs.

Core Elements of S-CCME Implementation Plan Phases (3 years in duration)

- Synthesis of existing knowledge;
- Advancement of new science and methodology;
- Communication of research findings.

Phase 1: 2012-2014

- **Synthesis of existing knowledge:**
 - Complete synthesis papers from the 2010 Sendai Symposium and 2012 Yeosu Symposium;
 - Interpret the vulnerabilities of marine ecosystems to changing climate.
- **Advancement of new science and methodology:**
 - Identify techniques for predicting climate change impacts in systems impacted by decadal variability;
 - Define the vulnerability of commercial species to climate change and identify which species would be most likely to experience shifts in spatial distributions;
 - Engage the global earth system modelling community in modelling climate change effects on marine ecosystems and identify opportunities for collaborations;
 - Build response scenarios for how the human community will respond to climate change.
- **Communication and integration of science through international symposiums:**
 - Publish results in peer reviewed literature;
 - Serve as symposium/session co-convenors;
 - Assist in preparing and convening the PICES/ICES/IOC Symposium on “*Effects of climate change on the world’s oceans*” (May 2012, Yeosu, Korea).

Phase 2: 2015-2017

- Continue to advance new science focused on climate change effects on marine ecosystems through theme/topic sessions and workshops;

- Update and improve forecasts with IPCC AR5 scenarios;
- Convene an international symposium in 2016;
- Develop regional synthesis reports;
- Initiate inter-sessional training for projecting climate change impacts on marine ecosystems;
- Continue collaboration with global climate change research community.

Phase 3: 2018-2020

- Continue to advance new science focused on climate change effects on marine ecosystems through theme/topic Sessions and workshops;
- Update and improve predictions with IPCC AR6 scenarios;
- Develop regional synthesis reports;
- Convene an international symposium in 2018.

Appendix II "SCOR Working Group Proposals"

The Scientific Committee on Oceanic Research (SCOR) has posted 10 SCOR Working Group proposals on their 2015 Annual Meeting page. PICES is one of the international organizations that is asked by SCOR to provide feedback on the proposals prior to the annual meeting. This year the annual meeting is in early December, and Ed Urban of SCOR has informed the Secretariat that advice (e.g., see the attached document, esp. the last page; please include a "must fund", "may fund" or "do not fund" rating for each proposal) from PICES would be most useful if sent to SCOR by the PICES Secretariat by early November.

Please review the proposals and be ready to discuss during the FIS meeting.

The proposals can be retrieved directly from the SCOR web site

(http://scor-int.org/SCOR_EC_2015.html)

Appendix III

Proposed Joint PICES-ISC Working Group on *Oceanographic Conditions and the Distribution and Productivity of Highly Migratory Fish*

Duration: January 2016-December 2018

PICES Parent Committee: FIS Committee

ISC Parent Committee and Working Group: Plenary Committee; Albacore Working Group

Proposed Co-Chairs: Gerard Dinardo (USA, ISC); Chi-lu Sun (ISC, Chinese Taipei) and two PICES members (TBD)

Background

The North Pacific Marine Science Organization (PICES) and the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) are two inter-governmental organizations that promote and coordinate marine scientific research on North Pacific marine ecosystem components. PICES is mandated to improve understanding of how marine ecosystems respond to climate change and human activities. The ISC is an independent regional fishery organization that provides scientific and stock assessment advice to the Western Central Pacific Fisheries Commission (Northern Committee) and the Inter-American Tropical Tuna Commission in support of fisheries management for highly migratory pelagic fish species in the North Pacific (i.e., tuna and tuna-like species). In 2015, a Joint Study Group on *Scientific Cooperation of ISC and PICES* (SG-SCISC) identified broad research areas of mutual interest and outlined a framework to develop and implement activities of science cooperation in the North Pacific Ocean.

Scientific Context

One area of overlapping research interest identified by the SG-SCISC is understanding of the oceanographic drivers of species distributions and productivity. The distribution and productivity of many commercial pelagic fish populations in the North Pacific Ocean are determined by large-scale oceanographic processes and climate variability. One hypothesis is that highly migratory pelagic species, such as albacore tuna (*Thunnus alalungus*), have environmental thresholds and preferences that drive their distribution and productivity. The highly migratory pelagic species of interest to the ISC occupy surface waters from coastal shelf to open ocean ecosystems and undertake large-scale feeding, spawning, and ontogenetic migrations linked to seasonal changes in oceanographic conditions. The proposed Joint Working Group will collaborate on deriving habitat models relating albacore tuna distributions to oceanographic conditions. Albacore tuna is the most temperate highly migratory species and much of its range overlaps the PICES domain. In addition, the stock is considered healthy and capable of supporting current exploitation thus environmentally-driven distribution and productivity changes should be more easily discernible from signals related to direct human impacts (fishing). The proposed Joint Working Group will also investigate mechanisms regulating albacore productivity by relating large-scale climate indices that describe North Pacific ocean states to albacore tuna recruitment indices and demographic parameters.

Proposed Approaches

Spatially-explicit environmental data are available as satellite and Argo float products, such as sea surface temperature, surface chlorophyll, frontal probability and mixed-layer depth, and can be used to index oceanographic conditions. Fishery catch per unit effort (CPUE) data are available by country and gear type and can be used to index species distribution patterns by life stage and season. These data can be used in a Generalized Additive Modeling (GAM) approach to identify oceanographic conditions that influence distribution. Other approaches which could be investigated include Bayesian Hierarchical Modeling and zero-inflated standardization. There are several large-scale climate indices that describe low-frequency variability of the North Pacific (i.e., Pacific Decadal Oscillation Index, North Pacific Gyre Oscillation) or describe teleconnections between the tropics and extratropics (e.g. Multivariate ENSO Index). Model estimates of recruitment or demographic parameters, such as biomass or fishing mortality, are available for albacore tuna. Bayesian approaches could be employed, dependent on availability of uncertainty estimates for recruitment or demographic parameter estimates.

Scientific outputs and benefits

- 1) Improved knowledge of the relationship between ocean conditions and distribution and productivity of albacore tuna will allow:
 - i) the ISC to incorporate spatially-explicit environmental data into future stock assessments of North Pacific albacore tuna. Inclusion of environmental variability in scientific advice is consistent with recent directions in stock assessment research.
 - ii) PICES to quantify how this important component of the marine ecosystem responds to human activities (fishing) and natural forcing. This quantification would support efforts to forecast ecosystem status, a key activity identified in the FUTURE Science Program.
- 2) Identification of fishery catch per unit effort (CPUE) hot spots by life stage, which could be used to identify prey hot spots.
- 3) Standardization of CPUE
- 4) Primary scientific publications.
- 5) Working Group final report published as a PICES Scientific Report.

Draft Terms of Reference

- 1) Promote research between PICES and ISC communities directed at understanding oceanographic conditions that provide suitable habitat for large, highly migratory pelagic fishes (specifically albacore tuna) in the North Pacific Ocean;
- 2) Facilitate communication, regular exchange of information and organization of meetings to discuss and publish data, methodologies and results of research outlined above;
- 3) Identify relevant environmental and distribution data sets for derivation of habitat models for albacore tuna, and if available for other key large pelagic fish species. Use these data to develop habitat models (and quantify model uncertainty), that identify oceanographic conditions that drive distribution of albacore tuna and predict fishery CPUE 'hot spots';
- 4) Identify relevant climate indices, demographic parameters and recruitment indices for investigation of climate driven variability in ocean state and productivity of albacore tuna, and if available for other key large pelagic fish species. Use these data to investigate linkages between large-scale climate indices and fish productivity.

- 5) Hold three workshops, one each year of the duration of the Working Group: with the first and third workshops held in conjunction with the PICES Annual Meeting (PICES-2016, USA and PICES-2018, Japan), and the second workshop held in conjunction with the ISC Plenary Meeting (July 2017, location TBD). Reports of these workshops will be jointly published by PICES and the ISC;
- 6) Produce peer-reviewed publications of scientific results;
- 7) Publish a final report summarizing the results of the WG as a PICES Scientific Report.

Appendix IV "Species on the move letter"

From: **Stewart Frusher** <Stewart.Frusher@utas.edu.au>

Date: Thu, Jul 9, 2015 at 8:16 PM

Subject: RE: PICES and moving species!

To: Libby Logerwell - NOAA Federal <libby.logerwell@noaa.gov>, Anne Hollowed - NOAA Federal <anne.hollowed@noaa.gov>

Cc: Cisco Werner - NOAA Federal <Cisco.Werner@noaa.gov>, Michelle McClure - NOAA Federal <Michelle.Mcclure@noaa.gov>, "King, Jackie" <Jackie.King@dfo-mpo.gc.ca>, Gretta Pecl <Gretta.Pecl@utas.edu.au>

Dear Libby and Anne,

Thanks you for your quick response.

From your options I would suggest option B: Co-sponsorship – light. PICES puts in some money and helps with attendance of a few key PICES scientists; possibly as invited speakers and potentially also uses the Trust Fund to help get early career scientists to the meeting.

Two themes which we believe would be of particular interest to PICES, and we welcome PICES providing suggestions for keynote or invited speakers, would be "*Implications of species range change for health, food security and ecosystem services*" and "*Cultural, social and economic dimensions of range shifts and changing ecosystems*". Please also refer to the website (<http://www.speciesonthemove.com/>) for other themes or workshops that you may have interest in.

We are very keen to support the next generation of scientists to be working in this space and have a range of opportunities available. These include a *Mentor Matching* program (see attached) and an *Early Career Networking Function* where ECRs will have the opportunity to meet and discuss their research with the plenary and invited speakers. We have also allocated space in the program for "*Lightening Plenary's*" which we will allocate to top ECRs. PICES would be welcome to nominate and support a person for one of these Plenaries.

Finally, the special issue of Global Change Biology will include summary and synthesis papers from the Conference and we have still to put these teams together so there is substantial scope for PICES involvement in these large team papers, in addition to individual contributions from PICES scientists on their particular areas of research.

Kind regards

Stewart Frusher, Gretta Pecl and Alistair Hobday, on behalf of the Species on the Move Organising Committee.

DRAFT AUGUST 8 2015

Implementation Plan

North Pacific Ecosystem Status Report, Third Edition (2009 – 2013)

Submitted to the
Science Board
North Pacific Marine Science Organization, PICES
DRAFT August 8, 2015

Study Group North Pacific Ecosystem Status Report, SG-NPESR

Please send comments and recommendations to: phil.mundy@noaa.gov

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Introduction

The implementation plan is an outline of events, also called milestones, with target dates for initiation or completion, and a set of appendices. The details of the events and milestones are provided in summary in the narrative following each implementation step from implementation Table 1, and in the appendices.

Implementation Table 1. Major events or milestones in producing NPESR3 in order of occurrence. The details of each item below are explained in the corresponding section of the implementation plan.

	Event or Milestone	Date Event or Completion
1	NPESR3 Proposed Implementation Plan to SB	Sept 25, 2015
2	SG-NPESR Meeting at PICES Qingdao	Oct 16
3	2015 SB Qingdao	Oct 25
4	Post-Doctoral Fellow NPESR	Nov 25
5	Ecosystem Time Series Contributions	Dec – March
6	NPESR3 Workshop on Climate Change Time Series w/ISB 2016	~ May 2016
7	NPESR3 Basic Web Publication	Sept
8	NPESR3 PICES Plenary Presentation	Oct

Overview of Proposed Implementation Plan

1. The proposal is to build a **web site** of national and International ecosystem time series observations "**ETSOs**" that constitute the basic web version of **NPESR3**. The basic web version of NPESR3 contains the building blocks for follow-on synthesis papers, summary brochures and books.
2. **Software for receiving and processing ecosystem time series observations and conducting basic administrative functions** will be developed and maintained by an independent contractor.
3. Each committee chair (or chair's nominee) forms the **NPESR3 editorial board**, reporting to the Science Board. The editorial board assists the independent contractors who support NPESR3 in **developing and maintaining a peer review network** for the ETSOs.
4. The basic web version of NPESR3 is **a collection of national (continental shelf) and extra-national (oceanic) ETSOs**. Reports for current systems and oceanic areas are to be produced during synthesis projects using the national contributions.

1. NPESR3 Proposed Implementation Plan to SB, Sept 25

The *draft implementation plan* is circulated to the SG-NPESR and Science Board during August and September 2015. Comments to the draft are invited. To the extent possible comments received by September 18 will be incorporated into the version submitted to the Science Board for preview on September 25. The meeting of the SG-NPESR in Qingdao on October 16 will reconcile any outstanding issues. All interested parties are invited to attend and join in the discussions at the SG-NPESR meeting. A final version of the implementation plan will be circulated to SB and interested parties on October 19. Members of the SG-NPESR will be attending committee meetings and otherwise available to answer questions during the week of the meeting.

2. SG-NPESR Meeting at PICES Qingdao, Oct 16

The SG meeting is for editing and planning. Editing the proposal to the SB, planning communications to committees on NPESR3, and developing the proposal and specifics of the workshop to review and edit descriptions of ETSOs for the basic web version of NPESR3, and plan proposals to SB 2016 for follow-on synthesis activities (i.e. workshops, study groups).

Proposed Agenda
SG-NPESR Meeting
PICES Qingdao, Oct 16, 2015

1. Discuss and agree to final **Implementation Plan NPESR3**
 - a. Committee assignments during Qingdao meeting
 - b. Science Board presentation
2. Proposal to PICES SB for the **2016 mid-term NPESR workshop on Sentinels of Climate Change; Environmental Time Series Observations.**
3. Planning for the Workshop
 - a. Time and Place,
 - b. Steering Committee,
 - c. Invited speakers,
 - d. SG-tasking

3. 2015 SB Qingdao

SG-NPESR asks to attend SB to answer questions during discussions on SB endorsement of the implementation plan, and to present the proposal for the Sentinels of Change workshop. Endorsement by SB begins the process of producing the third North Pacific Ecosystem Status Report.

4. Post-Doctoral Fellow NPESR3, Nov 25

The task at hand is to develop an effective automated process for receiving the ETSOs provided by the network of experts provided by the Editorial Board. It is proposed to embed a post-doctoral fellow with the **Resource Ecology and Ecosystem Modeling (REEM)** program at the Alaska fisheries Science Center in Seattle, Washington USA. The system currently employed by REEM for producing the annual [Ecosystem Considerations](#) report to the North Pacific Fishery Management Council is very similar to the one proposed to produce NPESR3. The existing protocols, software and hardware that are used by REEM to receive ETSOs and store them for processing into a variety of information products can be adapted to meet the needs of NPESR3 in a very cost effective manner. In order to take advantage of the basic infrastructure that REEM offers to contribute, it is necessary to have a person in Seattle to use the infrastructure for producing NPESR3. It is essential to NPESR3 implementation to have this person engaged as soon as possible.

5. Ecosystem Time Series Contributions, Dec - Mar

Before and during the Qingdao 2015 meeting, Committee chairs and their designees may be requesting national members to identify authors to contribute suitable ETSOs. After Qingdao, there will be a four month period preceding the ISB when the contributions will need to be made. For guidance on suitable time series, see the first two NPESR reports, and the section below entitled, *“Developing Criteria for PICES Ecosystem Time Series Observations”* and also the section entitled, *“Guidelines for Authors of NPESR Ecosystem Time Series Observations”* These references provide essential information for the initiation of the process. Nonetheless, bear in mind that this is a new process, so experience will be needed to guide us in the future. The workshop will be important to review the process, examine the time series contributed, and identify any gaps in coverage geographically or in subject matter.

6. NPESR3 Workshop w/ISB 2016

The NPESR3 is a new process, so a workshop at this point in development is prudent to develop insights on how things are going and to decide if changes are necessary. The workshop is an opportunity to review the outcomes of the process, examine the time series contributed, and identify any gaps in coverage geographically or in subject matter. It is also an opportunity to plan for syntheses using the basic web version of NPESR3, developing proposals to SB 2016. Participants at the workshop would include representatives of SG-NPESR and the Editorial Board, the independent contractor implementing NPESR3, as well as leading scientific experts on the time series that define the status of climate change in the North Pacific. The report of the workshop is expected to constitute the first draft of the basic web version of NPESR3, describing the contents, look and feel of the web site.

7. NPESR3 Basic Web Publication, Sept 2016

NPESR3 is expected to go live in September of 2016. Members of the public would be able to visit the site to view the ETSOs and associated metadata, including abstracts, maps of study area, and visualizations. When available, visitors would also be able to download the data for the time series, and representative publications. The web site is expected to take its place among the authoritative sources of ecosystem status and the effects of climate change in the North Pacific.

8. NPESR3 PICES Plenary Presentation

In order to get add as much value as possible to the basic web version of NPESR3 it is essential to capture the imaginations of the wider PICES community. Giving the NPESR3 a prominent place on the SB opening session provides an opportunity to introduce NPESR3 and the capabilities for synthesis it provides. It may also motivate people to become engaged in the follow-on activities proposed as a result of the interim workshop on NPESR3.

Appendix I. Reference Materials

The materials below were developed for presentation to the SB 2013. Dates below were predicated on a schedule that started in November 2013. The current timeline of NPESR3 is expected to start in November 2015, so the dates below may be updated by adding two years. Editor's note, August 8, 2015.

Overview

The third edition of the North Pacific Ecosystem Status Report (NPESR) is to be produced with the help of an independent contractor with the assistance of the committees of PICES. Committees identify, peer review and nominate ecosystem time series observations, ETSO. The process starts with nominations of ETSO by PICES standing committees. Nominations are submitted to an editorial board consisting of the chairs of the committees and chaired by the NPESR editor. The NPESR Editorial Board is a working group established by the Governing Council that reports to the Science Board. The Science Board approves and adopts the recommended suite of ETSO, which together form the basic elements of the next generation NPESR. The Editor is assisted by a web-based software system. The following activities are to be automated; receiving the text, references, graphics and time series from the author, preparing the metadata record by querying the author, formatting the rough draft of the contribution for distribution to the Editor and peer reviewers, receiving revised contributions and formatting the final revised contributions for posting on the web. The collection of invited, peer reviewed ETSOs, displayed on the web in the form of links within a Table of Contents, is the basic web version of NPESR3. The heart of NPESR3 is a web-based registry to which invited authors have submitted time series observations and associated metadata for peer review. ETSOs accepted by the peer review and editorial processes are web published in NPESR3. NPESR3 is the starting point for informing a wide diversity of audiences about the status of marine ecosystems of the North Pacific Ocean. Communications may take the form of a wide variety of types of media and multiple geographically and ecologically nested levels of synthesis.

Introduction

The proposal was developed jointly by two groups within PICES (SOFE and MONITOR) in consultation with TCODE, members of FUTURE and the Science Board. SOFE and MONITOR are leading the effort to fulfill the requirements in their terms of reference to provide advice on publication of future editions of the North Pacific Ecosystem Status Report, NPESR. The proposed status report is denoted simply NPESR3 to distinguish it from past editions of the NPESR. The terms of reference for the PICES Advisory Panel on Status, Outlooks, Forecasts, and Engagement, SOFE, call for coordination with the editors of the next version of the North Pacific Ecosystem Status Report,

NPESR, in order to develop advice on how the Report should be updated in the future. SOFE is advisory to the PICES Scientific Program, Forecasting and Understanding Trends, Uncertainty and Responses of the North Pacific Ecosystem, FUTURE. The terms of reference for the PICES standing technical committee on monitoring, MONITOR, call for it to contribute to the development of the NPESR, advising editors and lead authors on the particulars of monitoring issues. MONITOR is represented on the advisory panels of FUTURE, including SOFE.

The first draft of the proposed NPESR3 (October 18, 2011) was presented to SOFE, MONITOR and TCODE at the PICES 2011 Annual Meeting in Khabarovsk. Comments were received in Khabarovsk and subsequently incorporated into the second draft (May 21, 2012) which was presented and discussed at a plenary session during FUTURE intersessional meeting in Busan (May 2012). Extensive discussion of the draft by members of the PICES Secretariat, the Science Board and FUTURE was captured and incorporated into the present draft. It was most fortunate that the discussion benefited from the perspectives of two past editors of the first and second editions, Dr. Ian Perry and Dr. Skip McKinnell.

Incorporated into this draft are discussions at the Science Board meeting in St. Petersburg in May 2013. At the SB meeting, the concepts of engaging the chairs of standing committees in guiding the production of the report, and in utilizing the members of standing committees to locate and nominate content were presented. The present institutional structure of PICES provides the international scientific network of the standing committees (BIO, POC, FIS, MEQ, TCODE, MONITOR), and as the additional components of the Working Groups (WGs), Study Groups (SGs) and Sections (Ss) that may be used in the editorial process. The Busan FUTURE workshop (May 2012) achieved a reasonable consensus on the administrative structure and process for producing the NPESR3, however the proposal provides further details of scheduling, process and institutional structure for consideration by SB.

The sequence of activities and areas of responsibility for production of the NPESR3 is envisioned to start after approval by Governing Council in October 2013 (Table 1). The broad activities of **production**, **communication** and **synthesis** are separated for the purposes of description, even though they overlap in time (Table 1).

Description of Activities and Schedules

Production activities and schedule

The parallel activities of soliciting nominations within the PICES standing committees, and developing the automated web-based system (ETSOMS) would be initiated in November 2014 (Table 1). The nominations are received through the end of January 2014 by the editorial board, a Working Group consisting of the chairs of the committees and chaired by the NPESR editor. The NPESR Editorial Board evaluates the nominations received starting in January 2016 and makes its recommendations to the Science Board by the end of March 2014. The Science Board considers the nominations and authorizes the editorial board to issue invitations to authors by the end of May 2014. Authors begin to submit ETSOs in May 2014 (see Appendix II), with all submissions completed by December 2014. The Editor, assisted by ETSOMS and the independent contractor, format the rough drafts of ETSOs for distribution to the chairs of the standing committees from May through December 2014. ETSOMS is envisioned to be similar to the software of an online scientific journal. The chairs of the standing committees send the ETSOs out for peer review, which in most cases will

be perfunctory. ETSOs that have already been published in peer reviewed scientific journals in earlier versions would need no peer review other than verification that the methods published are still current. ETSOs not based on published methods would be considered if nominated and adopted by the Science Board. Authors of unpublished ETSOs would be required to submit a list of peer reviewers with contact information. Chairs of standing committees would serve to request the peer reviews, collect them and forward them to editors. Chairs of standing committees would have the opportunity to limit the amount of work involved by choosing not to recommend unpublished ETSOs to the Science Board. The following activities are automated; receiving the text, references, graphics and time series from the author, preparing the metadata record by querying the author, formatting the rough draft of the contribution for distribution to the Editor and peer reviewers, receiving revised contributions, and formatting the final contributions for posting on the web. The editorial process would deliver a penultimate draft of the NPESR3 to the Science Board at the beginning of March 2015. The Science Board assisted by members of standing committees would review, make comments and suggestions and then give approval by the end of May 2015. The editorial process would conclude at the end of June 2015 when the collection of invited, peer reviewed ETSOs, organized on the web as a set of links to entries in a Table of Contents (Appendix I) is posted on the web.

Communication activities and schedule

The process and schedule of communicating the NPESR3 runs in parallel to the process of production (Table 1). Drafts of the ETSOs would be available to authors, the editorial board and members of the Science Board as soon as they have been submitted and formatted in rough draft until they have completed the editorial and approval processes from May 2014 through June 2015. Anyone with access is encouraged to review the current draft of an ETSO, and to communicate directly to the author (copy to the editor), any errors or omissions detected. As the drafts complete peer review, they will be exposed to the full PICES community for review and comments directly to the authors from July 2014 through June 2015. Once approved by the Science Board, the NPESR3 would be open to the public, and the processes of using the NPESR3 to develop highlights, Regional syntheses and the overall synthesis would occur, all concluding in December 2015. Nominations of new ETSOs would be made by the standing committees at PICES annual meetings in odd years, and would follow the same cycle. Once an ETSO has been approved by the Science Board for web publication, the author would be able to update it when appropriate with notification to the editor being given by ETSOM. Any ETSO could be removed from the NPESR3 on recommendation of the Science Board with concurrence from its originating standing committee.

Synthesis activities and schedule

The activities of synthesis would necessarily precede in time the communication of highlights, regional syntheses, and the overall North Pacific synthesis. The synthesis activities would be conducted by study groups formed by recommendation of the Science Board and action of the GC at the annual meeting in the year preceding the synthesis activity (Table 1). A variety of communications products such as press releases, power points, and brochures could be developed from the Status Report in multiple languages. The national and oceanic ETSOs (indicators) would be aggregated into regional and trans-regional synthesis reports (see for example Canada's State of the Oceans Report, link below). Outreach and Engagement products based on the indicators could take the form of Power Points, professional, general, Web-based delivery of figures and data, brochures, multi-language, general audiences and press releases, public seminars (i.e. Sendai media model) .

The web based peer reviewed ETSOs would permit automated or partially automated production of the many different kinds of outreach and engagement information products cited above in any number of formats. For example the hardcopy publication by PICES of the five-year rollup (synthesis) would provide continuity with the first two five-year NPESR publications. Peer reviewed journal publications (paper and electronic) of regional contributions and syntheses would provide additional venues for dissemination of information. Authors who contribute data to the status report are welcome to also be authors of the synthesis effort. Authors contributing data would agree to release of the information to the public.

After December 2015, timing of updates of the ETSOs would follow an annual cycle, whereas derivative outreach and engagement products would be produced in response to needs identified by PICES members through the governance process. For examples, annual or biannual regional report updates may be appropriate and necessary in some regions, whereas in other localities the timing may be variable. Major syntheses of all North Pacific indicators might be done on five or six year intervals, or when a major event such as a regime shift is thought to have occurred.

Developing Criteria for PICES Ecosystem Time Series Observations

The basic component of the NPESR3 is the individual ecosystem time series observation, which is a fundamental core observation in biology, chemistry, physics, or environmental quality. Individual contributions of time series observations to the report would be entered into a template specific to the time series observation on a time frame appropriate to the observation, which commonly may be annually. Time series observations would be identified by, and reported in templates defined by PICES standing committees (BIO, FIS, POC, MEQ, MONITOR, TCODE). A basic template for reporting of ETSO has been developed by NOAA at the Alaska Fisheries Science Center in Seattle (Appendix II). The template is essentially a complete metadata record with components similar to and compatible with national and international standards (i.e. USFGDC, ISO; see also TCODE and NOAA references below). Data would be linked to the metadata record (see for example Alaska Marine Ecosystem Considerations Data Access below).

It is important to identify systematically monitored observations where the methods of collection and analysis have been published. For some ETSO spatial or temporal aggregation may be necessary to resolve proprietary issues. For examples of ETSO (also known by other terms, such as indicators) see Overland (2011).

Budget

The materials below were developed for presentation to the SB 2013. Dates are predicated on a schedule that starts in November 2013. The current timeline of NPESR3 is expected to start in November 2015, so the dates below may be updated by adding two years. Editor's note, August 8, 2015.

Personnel and material resources would be needed to accomplish the NPESR3 project (Table 2). To the extent possible, existing resources would be adapted to the needs of generating the next generation NPESR. It should be noted that substantial resources have already been committed for these purposes by all PICES' member nations, and by PICES. For example PICES already supports a server devoted to metadata and data exchange (PICES TCODE GeoNetwork, below). Further examples of some national projects that could contribute to the NPESR3 are given below,

however it is by no means complete. Please feel free to contribute your nation's relevant projects to the authors of this paper.

References and Examples

Alaska Marine Ecosystem Considerations. <http://access.afsc.noaa.gov/reem/ecoweb/>

Alaska Marine Ecosystem Considerations Data Access.
<http://access.afsc.noaa.gov/reem/ecoweb/DataAccess.php?Sort=IndexCategory>

AOOS Arctic Assets Map. <http://www.aoot.org/arctic-research-asset-map/>

Bering Climate Web Site. <http://www.beringclimate.noaa.gov/data/index.php>

Canada's State of the Oceans Report. http://dfo-mpo.gc.ca/science/coe-cde/soto/documents/dfo_soto/english/index-eng.htm

NOAA Arctic Report Card. <http://www.arctic.noaa.gov/reportcard/>

Overland, J.E. and D. Percival, 2011. Hunting Black Swans: Character of extreme climate and biological events in the Aleutian Islands and Bering Sea. North Pacific Research Board Final Report 829, 71 p. http://doc.nprb.org/web/08_prjs/829_Final%20report_Aug2012.pdf

PICES TCODE GeoNetwork Home Page.

Table 1. Schedule activities area of responsibility (10/2013). Note that dates for **current** NPESR3 are +2 years.

			2013	2014	2015
			N	D J F M A M J	J A S O N D J F M A M J J A S O N D
Production					
	Activity	Who?			
	ETSOMS Development	Contractor	█	█	
	ETSOMS Maintenance	Contractor		█	█
	ETSO Nominations	BIO_FIS_MEQ_POC_TCODE_MONITOR	█		
	Selection & Addition of Nominations	NPESR Editorial Board WG		█	
	Review and Adoption of Nominations	Science Board		█	
	Invitations & Confirmations to Authors	Chair NPESR Editorial Board WG		█	
	ETSO Submissions	Authors		█	
	Formatting	ETSOMS		█	
	Editing	Chair and Peer Reviewers		█	█
	Review and Adoption NPESR	Science Board			█
<hr/>					
Communication					
	Activity	Who?			
Web Access	Draft ETSO	Authors, Editorial Board, Science Board		█	█
Web Access	Peer Reviewed ETSO	PICES Community		█	█
Web Access	NPESR 2009 - 2013	Public			█
Brochure	Highlights	Public			█
PICES	Regional Syntheses	Public			█
PIO or DSR	North Pacific Synthesis	Public			█
<hr/>					
Synthesis					
	Activity	Who?			
	Highlights	Study Group on NPESR			█
	Regional Seas, Current Systems, Oceanic	Study Group on NPESR			█
	North Pacific	Study Group on NPESR			█

Table 2. Budget Oct. 2013. Note that dates for **current** NPESR3 are +2 years.

Production				
Activity	Who?	2013	2014	2015
ETSOMS Development	Contractor	\$18,000	\$27,000	
ETSOMS Maintenance	Contractor		\$28,000	\$18,000
ETSO Nominations	BIO_ FIS_ MEQ_ POC_ TCODE_ MONITOR			
Selection & Addition of Nominations	NPESR Editorial Board WG			
Review and Adoption of Nominations	Science Board			
Invitations & Confirmations to Authors	Chair NPESR Editorial Board WG			
ETSO Submissions	Authors			
Formatting	ETSOMS			
Editing	Chair and Peer Reviewers		\$17,500	\$15,000
Review and Adoption NPESR	Science Board			
Communication				
Activity	Who?			
Draft ETSO	Authors, Editorial Board, Science Board			
Peer Reviewed ETSO	PICES Community			
NPESR 2009 - 2013	Public			
Highlights Brochure	Public			\$7,000
Regional Syntheses PICES Pub	Public			\$7,000
North Pacific Synthesis Journal Pub	Public			\$7,000
Synthesis				
Activity	Who?			
Highlights	Study Group on NPESR			
Regional Seas, Current Systems, Oceanic	Study Group on NPESR			
North Pacific Synthesis Workshop	Study Group on NPESR			\$20,000
	Totals	\$18,000	\$72,500	\$74,000

Appendix II Guidelines for Authors of NPESR Ecosystem Time Series Observations

[Adapted from Guidelines for Ecosystems Considerations Contributions by Stephani Zador, stephani.zador@noaa.gov]

Contribution content follow the following outline and definitions:

1. Title: In title case (nouns, verbs capitalized; articles lowercase)
2. Contributed by: Authors of contribution
3. Contact author: Name of author to contact with questions
4. Contact information: Affiliation, mailing address, email address
5. Last updated: Month, Year
6. Body of contribution: 1 page of text and 1 or 2 figures and/or tables. If possible, the text of the contribution should incorporate the following
 - **Description of time series observation (ETSO):** a description of the ETSO including reference to methods, locating coordinates or polygon (decimal), and how the ETSO is useful for understanding climate change or its impacts.
 - **Status and trends:** the historical trends and current (2009 – 2013) status of the ETSO
 - **Factors influencing observed trends:** potential causes for observed trends and current status
 - **Implications:** Briefly answer these questions: What are the implications or impacts of the observed trends on the ecosystem or ecosystem components? What do the trends mean? Why are they important? How can this information be used to inform policy makers' decisions?
7. Figure(s) and/or Table(s) that illustrate the index (indices). 1 or 2 figures and/or tables.
 - **Figures and Tables:** Send figures and tables as separate jpg, png, or pdf. You may also include them in the doc with the text, but they should also be sent separately in highest resolution possible. Format them as for journal publication; keep the final size in mind when considering readability of axis labels. Use Arial font, at least 12 point, suitable for aging eyes to read a print version.
8. Literature Cited

Each reference cited in text must be listed in the Citations section and vice versa. Double-check for spelling, dates, and other publication details.
9. Data contributions

You are requested to submit the data illustrated in the figures and tables, while also providing the metadata that allows another scientist to reproduce your results.

THIS IS THE FINAL PAGE OF THE DRAFT IMPLEMENTATION PLAN OF AUGST 8 2015