

REPORT OF STUDY GROUP ON ECOSYSTEM STATUS REPORTING



Terms of reference

At PICES XV (October 2006, Yokohama, Japan), Governing Council formed a Study Group on *Ecosystem Status Reporting* (hereafter SG-ESR), under the direction of Science Board (Decision 06/S/6), with terms of reference as follows:

1. To develop options and budgets for paper and electronic versions of the North Pacific Ecosystem Status Report;
2. To provide its report by April 15, 2007, for consideration at the 2007 inter-sessional Science Board meeting.

Membership

It was agreed that the SG-ESR membership will include one representative from each member country and a representative from the Secretariat. Mr. Robin Brown (Canada) was recommended by Science Board and appointed by Council as Chairman of the Study Group. The full approved membership is listed below:

Canada	Robin Brown (Chairman)
China	Mingyuan Zhu
Japan	Akihiko Yatsu
Korea	Young-Shil Kang
Russia	Elena Dulepova
U.S.A.	Patricia Livingston
Secretariat	Skip McKinnell

Study Group process

The Study Group worked by correspondence. Terms of reference, relevant reports (including the output from the 2005 MONITOR Workshop) were reviewed, and approach for preparing this report was agreed upon. Through this process, SG-ESR developed the four options presented here. Each option describes a variation of the Ecosystem Status Report. For each option, the nature of the report, who would do the work, and the costs, were described, along with a summary

of the advantages and disadvantages of each approach. In addition, some options for funding this activity were developed.

At the 2007 inter-sessional Science Board meeting (Yokohama, Japan), the preference was given to the “incremental” improvement” report (Option 2) and the “integrated” ecosystem assessment (Option 4). At the follow-up inter-sessional Governing Council meeting, SG-ESR was requested to determine the “level of effort”, including the costs borne by member countries, required to complete Option 2. This information was compiled in the section on costs.

Highlights of options

Option 1: “Focused” report (SG-ESR Endnote 1)

- choose a smaller and more tractable objective;
- identify a smaller team to do the work;
- (possibly) base on a much more limited set of indicators.

Option 2: “Incremental improvement” report (SG-ESR Endnote 2)

- retain the same scope and structure as the 2004 report;
- attempt to fill some of the identified gaps;
- produce a report similar to the pilot version, working (over the years) to improve the completeness and quality in steps.

Option 3: “Strategic North Pacific ecosystem assessment” (SG-ESR Endnote 3)

- produce tightly focused “extracts” of information from regional seas/LMEs;
- make structure/focus to be defined by a new integrative scientific program of PICES.

Option 4: “Integrated ecosystem assessment” report (SG-ESR Endnote 4)

- develop consistent (or reasonably complete) integrated ecosystem assessments for each regional sea/LME;

- assemble North Pacific Ecosystem Status report through integration and analysis of the products from these ecosystem assessments.

Costs

The costs for the four options are summarized in Table 1. The costs for the first ESR (pilot project) are included for comparison. A more complete explanation of costs is provided with each detailed description of the options in the Endnotes.

For each of the four options, direct costs were estimated. These costs included the expenses of running workshops, graphic design, report production and development of web products, but did not include the “in-kind” contributions by member countries for their scientific staff or the costs for these scientists to travel to workshops and other activities. In Table 1 these “costs” were identified in the row labeled “People (in-kind contribution by members)”, but no value was assigned. After receiving a draft report at the inter-sessional meeting, Council requested that SG-ESR provide an estimate of the level of effort involved.

SG-ESR understands that many scientists in member countries provide valuable input at the regional workshops and it would be very difficult to estimate this total contribution. Furthermore, there are usually one or two very

dedicated individuals who take on the work of assembling the input from the regional workshops. To estimate the level of effort, SG-ESR used the outline of major chapters from the pilot report and focused on the level of effort for the chapter coordinators (Table 2).

In assembling these costs, it should be recognized that some regions/chapters were more difficult to produce based on the practical issues, such as the number of countries (and languages) of the PICES nations that border on these regions and the current availability of “ecosystem-level” data and analyses for these areas.

Funding options

Funding for new PICES activities is always a challenge. The member countries are generally resistant to increases in the annual fees that exceed the rate of inflation. Some strategies might include:

- “Self-funded” – Member countries agree to provide the key personnel and their costs (travel, *etc.*) of participation. While this is the generalized model for participation in PICES activities, it is not always possible for each of the countries to cover the costs of all the relevant experts.
- Voluntary contributions – While this option has been in place for several years and has been used effectively, relatively few parties have chosen to contribute in this manner.

Table 1 Summary of the direct costs (in \$K) for each of the four options

	Option 1	Option 2	Option 3	Option 4	
	Focused	Incremental	Strategic	IEA	<i>Pilot Project</i>
Workshops and reports	205	248	300	188	130
People (In-kind contribution by members)					0
Secretariat					115
Overhead					0
Total	205	248	300	188	245

Table 2 Workload for lead scientists to prepare the next Ecosystem Status Report (Option 2)

Chapter/Section	Estimated workload for Chapter coordinators
Synthesis	1 person month + 1 person month from the Secretariat
Ocean and climate changes	1 person month + 1 person month from the Secretariat
Yellow Sea/East China Sea	3 person months
Japan/East Sea	3 person months
Okhotsk Sea	2 person months
Oyashio/Kuroshio	2 person months
Western Subarctic Gyre	3 person months
Bering Sea	3 person months
Gulf of Alaska	2 person months
California Current	2 person months
Gulf of California	2 person months
Transition Zone	2 person months
Tuna	<i>(not estimated) provided by the Inter-American Tropical Tuna Commission</i>
Halibut	<i>(not estimated) provided by the International Pacific Halibut Commission</i>
Pacific salmon	<i>(not estimated) provided by the North Pacific Anadromous Fisheries Commission</i>

- Special levy – Member countries agree to special contributions to the Organization being directed to this activity. This might enable the countries to justify an apparent increase to the budget for a specific deliverable/product and a specific (fixed and limited) time period for funding (not a permanent increase in annual fees).
- External funding – PICES has attracted support from foundations and the North Pacific Research Board.
- Some blend of the above.

Recommendation

The Study Group did not achieve consensus of a preferred option. Options 2 (“Incremental improvement” report) and 3 (Strategic North Pacific ecosystem assessment) were supported. Option 1 (“Focused” report) was considered to be too narrow to be useful and Option 4 (Integrated ecosystem assessment approach) was considered to be a desirable target in the long term, but impractical at present. The options are described in more detail on the following pages.

SG-ESR Endnote 1

Option 1: “Focused” report

1. Overview

PICES would agree to a more focused approach, with a more restricted objective, producing a shorter and less costly ESR, but lacking the inclusive approach of the pilot report. Strategies for reducing the focus might include:

- a. Focus on a much more restricted list of indicators and species;
- b. Focus on one part of the ecosystem for each report (*e.g.*, primary production; marine mammals);
- c. Focus on a single scale (basin-scale only; ignoring the Large Marine Ecosystem/enclosed sea scale).

2. Reporting interval

- a. Could be fairly frequent (annual) if the focus is sufficiently narrow.

3. Role of PICES Committees and Secretariat

- a. Science Board – select the focus for each annual component; identify which Committee and/or expert group was to lead the annual activity; take overall responsibility for progress, completion and quality control;
- b. Relevant Standing Committee(s) (varies with subject matter) – assemble and quality control the information; write the report;
- c. TCODE – assemble data, including metadata;
- d. PICES Secretariat – provide report editing, design, production, distribution and website.

4. Expectations of Contracting Parties (in addition to their “normal” PICES activities)

- a. Ensure that their national appointees on relevant committees and experts groups

are willing and capable of representing their country OR identify alternates.

5. Cost implications

- a. Workshops to review and edit national contributions (conducted in conjunction with the Annual Meeting);
- b. Editing, publications and distribution costs (printed copies);
- c. Web version.

6. Advantages

- a. Relatively easy to accomplish;
- b. Over several years, the workload is transferred around the PICES Committee structure.

7. Disadvantages

- a. Does not demonstrate ecosystem linkages easily;
- b. Each report will have limited interest;
- c. It may be difficult to agree on the “constraints” – it is always easier to get people to agree to do everything;
- d. Focusing on a limited set of indicators will likely result in a very “commercial fisheries” focus;
- e. Developing consensus on a limited range of indicators has proven to be difficult in other fora and may inhibit improved scientific understanding.

8. Costs

Fiscal Year	Activity	Cost (\$K)
2009	Symposium	100
2009	Synthesis workshop	25
2010	Graphic design	20
2010	Printing	30
2010	Distribution	30
	Total	205

SG-ESR Endnote 2

Option 2: “Incremental improvement” report

1. Overview
 - a. PICES would repeat the 2004 report, taking advantage of the lessons learned and existing work, but attempting to address some of the identified shortfalls. More effort would be put for obtaining and integrating comparable data from across the Pacific and analyzing the assembled information (perhaps even assembling a dataset that could be used for subsequent analyses and scientific publications);
 - b. The report would be similar to the pilot report, with information on the regional seas and an expanded synthesis at the North Pacific ecosystem level.
2. Reporting interval
 - a. Every five years (?). Based on this the target date for the next report would be the end of 2009.
3. Role of PICES Committees and Secretariat
 - a. Science Board – provide general oversight of the report preparation process; integrate activities into PICES Committee Work Plans and into Annual Meetings; take overall responsibility for progress, completion and quality control;
 - b. MONITOR Technical Committee – plan and execute workshops; develop (write) chapters; carry out quality control (with assistance from other Committees and expert groups); report on progress; identify shortfalls and recommend solutions;
 - c. TCODE – assemble data, including metadata;
 - d. PICES Secretariat – assist in organizing regional workshops; provide report editing, design, production, distribution and website.
4. Expectations of Contracting Parties (in addition to their “normal” PICES activities)
 - a. Ensure that their national appointees on relevant committees and expert groups are willing and capable of representing their country OR identify alternates. This is a substantial task, and for success, PICES nations will have to devote significant amounts of time from some of their key scientists.
5. Cost implications
 - a. Multiple regional workshops for coastal/marginal seas/LMEs;
 - b. Thematic workshops to fill identified gaps in the 2004 report;
 - c. Workshops to review and edit regional contributions (in conjunction with the Annual Meeting, if practical);
 - d. One or more integration/synthesis workshops to work with the assembled data series and carry out some preliminary ecosystem-wide analyses;
 - e. Editing, publications and distribution costs (printed copies);
 - f. Web version.
6. Advantages
 - a. Provides a comprehensive description of the state of ecosystems in the North Pacific;
 - b. Builds on experience from the pilot report;
 - c. Is similar to/builds upon some existing national activities;
 - d. Provides a path for incremental improvement;
 - e. Could lead to very interesting analyses and scientific debates from compiled datasets;
 - f. Costs and effort required may decline (slowly) after several report production cycles.
7. Disadvantages
 - a. Requires strong leadership at the regional seas/LME level and greater attention to standardizing approaches in preparation for the data integration phase;
 - b. Needs support of many scientists from Contracting Parties;

- c. Will be difficult to ensure a consistent level of reporting across many ecosystem components and many regional seas/LMEs;
- d. Will be expensive;
- e. “Burst mode” – one intensive year of work in a 5-year cycle may be difficult to integrate into the annual focus of most PICES activities.

8. Costs

Fiscal Year	Activity	Cost (\$K)
2008	Regional workshops	40
2008	Thematic workshops	50
2008	Graphic design	30
2009	Synthesis workshop	60
2009	Printing	40
2009	Distribution	23
2009	Internet	5
	Total	248

SG-ESR Endnote 3

Option 3: Strategic North Pacific ecosystem assessment

1. Overview

- a. PICES would develop a report which is focused on the North Pacific, basin-scale level, with reduced contributions/details at the regional seas/ LME scale. More effort would be put on obtaining and integrating comparable data from across the Pacific and analyzing the assembled information (perhaps even assembling a dataset that could be used for subsequent analyses and scientific publications);
- b. The details of the report structure and focus would be tightly “bound” to the requirements/direction of the Study Group on *Future Integrative Scientific Program(s)* (SG-FISP) (which is not yet fully described);
- c. The report would draw heavily on ecosystem monitoring/reporting activities in regional seas/LMEs that are being carried out by existing national and international activities. It may be necessary for PICES to lead this in some regional seas/LMEs where there is no such program in place.

2. Reporting interval

- a. Every five years (?). Based on the plans for development of the next PICES integrative scientific program, the target date for the next report would be the end of 2013 (5 years after the development of the FISP Implementation Plan).

3. Role of PICES Committees and Secretariat

- a. Science Board – provide general oversight of the report preparation process; integrate activities into FISP Study Group Work Plans and into Annual Meeting;
- b. FISP (PICES Scientific Program, not yet created) – determine the focus, scope and strategy; lead the process for defining and developing the required inputs and the workshop process for data integration and analysis; outline sub-tasks for Standing Committees and expert groups; write the report;
- c. Standing Committees and expert groups – execute tasks assigned by FISP, including analyses and written reports on sub-components; carry out review and quality control on components;
- d. TCODE – assemble data, including metadata;
- e. PICES Secretariat – assist in organizing regional workshops; provide report editing, design, production, distribution and website.

4. Expectations for Contracting Parties (in addition to their “normal” PICES activities)

- a. Ensure that their national appointees on relevant committees and expert groups are willing and capable of representing their country OR identify alternates. This is a substantial task, and for success, PICES nations will have to

devote significant amounts of time from some of their key scientists.

5. Cost implications
 - a. Workshops to define the requirements for Ecosystem Assessment, based on the Strategic and Implementation Plans developed for FISP;
 - b. Thematic workshops to fill identified gaps in the 2004 report;
 - c. One or more integration/synthesis workshops to work with the assembled data series and carry out some preliminary ecosystem-wide analyses;
 - d. Editing, publications and distribution costs (printed copies);
 - e. Web version.
6. Advantages
 - a. Provides a comprehensive description of the North Pacific ecosystem;
 - b. Provides a shorter report with a tighter focus;
 - c. Is more closely “bound” to the core activity of PICES (FISP);
 - d. Could lead to very interesting analyses and scientific debates from compiled datasets;
 - e. Costs and effort required may decline (slowly) after several report production cycles.
7. Disadvantages
 - a. Requires strong leadership (from FISP SSC/SG-FISP) to define the objectives

for the report and strategy for its delivery;

- b. FISP is not yet defined, and this will delay production;
- c. Needs support of many scientists from Contracting Parties;
- d. Less information at the regional seas/LME level will be presented in the report;
- e. It may be a challenge to get an adequate quantity and quality of information for all regional seas/LMEs;
- f. “Burst mode” – one intensive year of work in a 5-year cycle may be difficult to integrate into the annual focus of most PICES activities.

8. Costs

Fiscal Year	Activity	Cost (\$K)
2008	FISP NP Status workshop	10
2009	FISP Scientific Report	15
2009	FISP NP Status workshop	10
2010	FISP Scientific Report	15
2010	FISP NP Status workshop	10
2011	FISP Scientific Report	15
2011	FISP NP Status workshop	10
2012	FISP Scientific Report	15
2012	FISP symposium	100
2012	Graphic design	20
2013	Scientific Report	20
2013	Printing	30
2013	Distribution	30
	Total	300

SG-ESR Endnote 4

Option 4: Integrated ecosystem assessment approach

1. Overview
 - a. PICES would expand upon the process developed for the 2004 pilot report, by developing times series of suites of key indicators of ecosystem status. These indicators will be assessed, along with modeling results, to propose reference values for the desired state of various marine ecosystems, and capability will be developed to forecast future states of the ecosystem resulting from various “perturbations” or pressures (fisheries removals, climate change, coastal development, pollution);
 - b. Each Contracting Party would participate in producing this information at the regional seas/LME level, and the main PICES activity would be to integrate the information for the entire North Pacific;
 - c. The actual direction and rate of progress would be determined by the degree of

- correspondence of this approach with the activities of FISP.
2. Reporting interval
 - a. Every 5 years (?). Based on this the target date for the next report would be 2009.
 3. Role of PICES Committees and Secretariat
 - a. Science Board – define and approve the scope and structure of the report; provide oversight of the report preparation process; integrate activities into PICES Committee Work Plans and into Annual Meeting;
 - b. Scientific Committees – recommend procedures and approaches for conducting integrated ecosystem assessments; execute tasks assigned by Science Board, including analyses and written reports on sub-components; carry out review and quality control on components;
 - c. MONITOR Technical Committee – develop recommendations for Science Board (workshops, *etc.*) and report progress, identify shortfalls and recommend solutions; write the report;
 - d. TCODE – assemble data, including metadata;
 - e. PICES Secretariat – assist in organizing regional workshops; provide report editing, design, production, distribution and website.
 4. Expectations for Contracting Parties (in addition to their “normal” PICES activities):
 - a. Ensure that their national appointees on relevant committees and expert groups are willing and capable of representing their country OR identify alternates. This is a substantial task, and for success, PICES nations will have to devote significant amounts of time from some of their key scientists;
 - b. This option assumes that PICES Contracting Parties will commit to the application of some advanced ecosystem assessment processes for national waters and shared regional seas/LMEs.
 5. Cost implications
 - a. Multiple national and regional workshops to develop (reasonably) consistent national/regional approaches and capabilities;
 - b. Multiple regional(?) workshops for coastal/marginal seas/LMEs;
 - c. Workshops to review and edit regional contributions (in conjunction with the Annual Meeting, if practical);
 - d. One or more integration/synthesis workshops to work with the assembled data series and carry out some preliminary ecosystem-wide analyses;
 - e. Editing, publications and distribution costs (printed copies);
 - f. Web version.
 6. Advantages
 - a. Documents the ecosystem status with many ecosystem components, and many regional seas/LMEs represented;
 - b. Builds on the experience from the pilot report;
 - c. Is similar to some national activities;
 - d. Would provide a substantial improvement in output products (predictions for future states of ecosystems under various scenarios);
 - e. Could lead to very interesting analyses and scientific debates from compiled datasets;
 - f. Would allow for better international decision-making;
 - g. Would be more consistent with other international activities (*e.g.*, IPCC reports);
 - h. Costs and effort required may decline (slowly) over several report production cycles.
 7. Disadvantages
 - a. Requires scientific capacity that may not be present in all PICES Contracting Parties;
 - b. Requires leadership at the national/regional/LME level and for the integration phase (North Pacific-wide);
 - c. Needs support of many scientists from Contracting Parties;

- d. Will be difficult to ensure a consistent level of reporting across many ecosystem components and many regional seas/LMEs;
- e. Will be very expensive;
- f. Would require a sustained effort over multiple years to prepare a first version.

8. Costs

Fiscal Year	Activity	Cost (\$K)
2008	Planning workshop	40
2009	Synthesis workshop	50
2008	Graphic design	30
2009	Printing	40
2009	Distribution	23
2009	Internet	5
	Total	188

