Fisheries and Oceans Canada | Pêches et Océans Canada
Science | Sciences

Canadian Science Advisory Secretariat (CSAS)

Proceedings Series 2014/002

National Capital Region

Proceedings of the national science advisory process concerning the national synthesis of the 'Ecosystem Research Initiatives'

November 14-15, 2012
Sidney, British Columbia

Chairpersons: R. Ian Perry and Andrea White
Editors: Roger Wysocki and Andrea White

Fisheries and Oceans Canada
200 Kent Street
Ottawa, ON K1A 0E6

February 2014

Canada

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Published by:

Fisheries and Oceans Canada
Canadian Science Advisory Secretariat
200 Kent Street
Ottawa ON K1A 0E6

http://www.dfo-mpo.gc.ca/csas-sccs/
csas-sccs@dfo-mpo.gc.ca

ISSN 1701-1280

Correct citation for this publication:

DFO. 2014. Proceedings of the national science advisory process concerning the national synthesis of the 'Ecosystem Research Initiatives'; November 14-15, 2012. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2014/002.

Aussi disponible en français :

MPO. 2014. Compte rendu du processus de consultation scientifique nationale sur la synthèse nationale des « initiatives de recherche écosystémique »; les 14 et 15 novembre 2012. Secr. can. de consult. sci. du MPO, Compte rendu 2014/002.

TABLE OF CONTENTS

SUMMARY

A national science advisory process was held November 14-15, 2012 at the Institute of Ocean Sciences in Sidney, British Columbia. The purpose of the meeting was to highlight the findings of the Fisheries and Oceans Canada (DFO) Ecosystem Research Initiatives (ERIs) and to summarise the 'lessons learned' from that program.

The advisory process was informed by a working paper and presentations provided by researchers from DFO Science who participated in the ERIs. A total of 20 participants from six DFO Regions and two DFO sectors attended this advisory process. These Proceedings summarize the discussions of the meeting. An overview of the results and the 'lessons learned' from the ERIs are summarised in the related Science Advisory Report (DFO 2013) and Research Document (White et al. 2013).

SOMMAIRE

Un processus de consultation scientifique nationale a été organisé du 14 au 15 novembre 2012 à l'Institut des sciences de la mer à Sidney, en Colombie-Britannique. Les objectifs de la réunion étaient de présenter les points saillants des conclusions des initiatives de recherche écosystémique (IRE) de Pêches et Océans Canada (MPO) et de résumer les « leçons retenues » dans le cadre de ce programme.

Le processus de consultation était basé sur un document de travail et des présentations données par des chercheurs du Secteur des sciences du MPO ayant pris part aux IRE. En tout, vingt participants provenant des six régions du MPO et de deux secteurs du MPO ont pris part à ce processus de consultation. Le présent compte rendu résume les discussions tenues lors de la réunion. Un aperçu des conclusions et un résumé des « leçons retenues » dans le cadre des IRE sont donnés dans l'avis scientifique (MPO 2013) et le document de recherche (White *et al.* 2013) connexes.

INTRODUCTION

Opening Remarks

The meeting Co-Chairs, I. Perry and A. White welcomed participants (Annex I) to the national science advisory process concerning the national synthesis of seven Ecosystem Research Initiatives (ERIs), and did a round of introductions. R. Wysocki was introduced as rapporteur for the meeting.

The Co-Chairs provided the context, background, and rationale for the meeting. Participants were asked to familiarize themselves with the workshop Terms of Reference (Annex II) as these would provide the basis for the discussions and also the Science Advisory Report. The meeting agenda was also provided (Annex III).

The Co-Chairs outlined the structure of the two-day meeting which consisted of a series of presentations, followed by plenary and break out group discussions. The Co-Chairs reiterated the main points of the Science Advisory Report that were drafted and agreed to by participants during the plenary session.

Context for Meeting

The ERIs were conducted from 2007-2012 by the Ecosystems and Oceans Science Sector of DFO. The ERI program was comprised of seven large-scale ecosystem research programs that focused on how Science could support the Department's implementation of an ecosystem-approach to management (EAM). The ERIs have concluded and Regional syntheses of their respective research and advice have been produced.

A national science advisory process was held (November 14-15, 2012) in Sidney, British Columbia to highlight the Regional findings, discuss the 'lessons learned', examine the current or potential application of these initiatives in support of an EAM, and to provide recommendations for ecosystem science within the Department.

PRESENTATIONS

Research highlights were a substantial part of each Regional presentation but are not included in these Proceedings. For detailed summaries of key findings from each of the ERIs, please refer to White et al. (2013).

Strait of Georgia ERI (I. Perry & D. Masson)

An overview of the administration (e.g. theme development, a competitive 'Call for Proposals', funding priorities) of the Strait of Georgia ERI was presented. It was noted that funding/research priorities were identified primarily by DFO staff, but also by researchers in academia. A primary focus of the Strait of Georgia ERI was to establish a basis for the management of ecosystem and human interactions in an integrative framework. This included research related to understanding what aspects of the ecosystem control productivity, identification of the drivers of change, and how those drivers may change in the future. It was emphasized that the tools developed under the Strait of Georgia ERI have broader applicability than just that ecosystem and could be considered for other areas and/or Regions.

A number of EAM-related data and knowledge gaps were identified. In particular, comparisons of upper trophic models, their sources of uncertainty, and the credibility of their results are

needed. In addition, spatially-explicit models, particularly those that include nearshore and benthic habitats, are lacking.

It was noted that with the retirement of many scientists, there is an increasing risk of loss of knowledge of this ecosystem; appropriate data assembly and archiving is needed to offset this risk.

The EAM-related needs of the non-Science sectors in Pacific Region were provided and considered. These needs were:

i) how to address multiple and cumulative impacts, particularly the nearshore benthic environment; and
ii) identification of thresholds at local and/or project spatial scales (rather than generic advice based only on larger-scale biological data).

A process for the collaboration and coordination among DFO sectors was deemed necessary, and a working group was recommended. It was suggested that this same working group could liaise with a similar group in other Regions and potentially external partners.

Beaufort Sea Shelf ERI (C. Hoover & J. Paulic)

Although the Beaufort Sea Shelf ERI was located within the eponymous Beaufort Sea Large Ocean Management Area (LOMA), the ERI focused only on the shelf area. A particular area of interest was the Tarium Niryutait Marine Protected Area. It was noted that Inuit community involvement was a key component of many of the ERI research projects.

Research was targeted at each of the trophic levels and results fed into an overarching ecosystem model that was also developed under this ERI. The research conducted was a collective effort towards assessing the cumulative impacts of harvest, climate change, oil and gas development, and the potential of other additive stressors.

In retrospect, it was suggested that it would have been useful to have more detailed criteria that was closely linked to the goals and objectives of the program to assist in the selection of funded research projects. In addition, an open and regular dialogue between Science and other sectors would have been beneficial in order to identify pressures and to manage expectations regarding research results.

Lake Ontario (M. Koops)

At the onset of this ERI, a scoping workshop was held to determine research objectives followed by the selection and funding of appropriate research projects, and a subsequent workshop to integrate management/policy needs.

Research under the Lake Ontario ERI included an evaluation of how coastal areas contribute to the functioning of the whole lake, an assessment of the sensitivity of nearshore areas to cumulative impacts from multiple stressors, and predictions of how the nearshore will respond to future environmental conditions.

It was emphasized that consultation between Science and other sectors is an essential step in identifying priorities for research and funding. Partnering and collaboration between scientific experts was noted to be invaluable, but is often challenging – both internally at DFO and also with external colleagues. Strong communication between freshwater and marine researchers can be mutually beneficial, and expertise on the marine environment can inform and benefit Great Lakes science.

It was pointed out that most projects, regardless of topic, would benefit from, but are not always aware of, relevant data sets from other sources. Integration of data sources and tools would greatly assist in assessing the cumulative impacts of multiple stressors. In addition, identification of data needs for emerging issues is required, as are improved shared access between Canadian and American data sets.

To improve Science support of other Departmental sectors, a number of key actions were identified such as:

(i) linking human activities that affect fish and fish habitat to impacts on productivity,
(ii) a better understanding of species and habitats that support fishery species,
(iii) a better understanding of the impacts of non-native aquatic species, and
(iv) implementation of an integrated EAM to assist in prioritising competing priorities for human and financial resources.

Lower St. Lawrence Estuary ERI (P. Galbraith & M. Lebeuf)

The Lower St. Lawrence Estuary ERI tested an approach for science support of EAM. The general objective was to develop and apply an operational framework in order to address several key issues related to human activities and their impacts on biological and ecological processes in an integrative manner.

The planning stages of this ERI included several workshops with scientists and internal/external client and stakeholders to identify priority issues. The development of the science program included new and existing projects and monitoring programs in support of the identified issues. Integrated scientific assessments (16 in total) were conducted and eventually a peer-reviewed science advisory process was concluded.

Research efforts under this ERI were more focused on management issues than previous collaborative programs in this Region. It was suggested that management of future research initiatives (i.e. steering committees and project leaders) should focus on integration between projects and addressing knowledge gaps rather than on the accomplishment of individual project goals. A directed call for proposals could potentially be an appropriate approach.

This ERI stimulated various scientific collaborations by leveraging funds from other programs, thus creating a substantially larger budget from which to conduct the research. However, some of the research priorities were not addressed owing to a lack of suitable submitted proposals, time constraints, or issues related to capacity/expertise.

Challenges related to data availability, quality, and/or quantity resulted in certain ecosystem components/relationships not being integrated into some analyses.

It was suggested that long-term monitoring is needed for the validation of potential ecosystem indicators and that ecosystem status reporting should be conducted every 5-7 years; this kind of reporting is essential for supporting integrated management at the ecosystem-level.

Although non-Science sectors have an important role in determining funding priorities, disparate and overly specific requests are difficult to reconcile and as a result to provide meaningful results. In some cases, studies not requested by internal clients should be conducted to support Departmental Science initiatives and contribute to relevant external partnerships and/or commitments.

Northumberland Strait ERI (M. Comeau & M. Lanteigne)

For the Northumberland Strait ERI, a stakeholder group identified four fields of work that were a priority to this area: physical and biological oceanography, marine quality, and the human

environment. From these topics, Regional Science representatives identified overarching objectives and expected deliverables.

There were struggles with the overall concept of EAM and differing perceptions between various parties (e.g. DFO sectors, stakeholders, provincial representatives, etc.) which created confusion and variability in expectations of results.

Conducting research in the nearshore environment was a challenge given the numerous interests and jurisdictions, and was certainly more complex than the research conducted in the mid- to offshore environment. Nonetheless, the location of this ERI provided the opportunity to combine efforts within DFO and externally to achieve the research objectives.

Several knowledge gaps were identified that would benefit from further research, including:

(i) the impact of contaminants on the biota,
(ii) research on metabolic rates and the consumption of coastal species, as well as linkages to climate change, and
(iii) the need to develop and agree on long-term ecosystem monitoring programs.

Gulf of Maine ERI (A. Bundy & P. Lawton)

The Gulf of Maine ERI augmented ongoing research efforts aiming to provide a basis for biodiversity, productivity, and habitat-related objectives. Three different types of Science advice were delivered through this ERI:

1) short-term, tactical advice that directly linked to operational objectives;
2) medium-term, strategic advice that was more general, and more easily integrated into policy; and
3) longer-term, conceptual advice to better understand ecosystem functioning and the relative importance of different ecosystem processes, as well as advance scientific theory.

The latter advice forms the underlying context for management planning and decision-making.

It was noted that large-scale ecosystem research programs such as the ERIs are greatly affected by the timeframe allowed for implementation. The need for longer timeframes in the case of this ERI was evidenced through issues in short-term staffing and concomitant loss of expertise. However, the presenter did indicate that there are many benefits to research programs such as the ERIs (e.g. multi-faceted research projects that encourage collaborative approaches and the opportunity for leveraging of additional funding).

It was suggested that the Department would benefit from a national short-term staffing model to facilitate the initiation and progress of research projects and/or the opportunity for indeterminate researchers to dedicate time in order to focus on these initiatives and ultimately to build on and retain the resulting expertise.

Newfoundland Shelf ERI (M. Koen-Alonso & P. Pepin)

The Newfoundland Shelf ERI was designed to generate useful information for EAM, but without assuming any specific framework. It was intended to address those basic elements of ecosystem organisation and functioning that would be required for any EAM implementation.

In addition to the research objectives, a focus of this ERI was to ensure its connection to other existing Departmental initiatives and programs (e.g. Atlantic Zone Monitoring Program, Centre

of Expertise on Marine Mammals), as well as international organisations and their relevant working groups (e.g. Northwest Atlantic Fisheries Organization).

It was noted that EAM requires more data and the development of new tools and approaches compared to traditional single-species approaches to management. A stable funding source, including appropriate human resources, tools, and equipment are critical in conducting successful research programs that provide meaningful results. In addition, the importance of monitoring was reported to be essential but that a cost-benefit analysis could be helpful in determining the positive impact additional information from new sources could provide.

A National Synthesis and Lessons Learned from the ERI (A. White & I. Perry)

A working paper was presented that summarised the implementation of the ERIs among different DFO Regions and discussed the 'lessons learned' with respect to design, coordination, and implementation of complex science programming at the ecosystem scale.

Key conclusions and advice from this synthesis included:

1) the need for multi-sector cooperation at regional and national levels to identify priorities for Science support to management/policy, including guidance at the National level as to over-arching objectives for an EAM;
2) the needs for new tools to assess cumulative impacts; and
3) the improvement of comprehensive ecosystem-level monitoring, assessment, and predictive capabilities.

Participants discussed this working paper; recommendations were provided and considered in the finalisation of this report as a CSAS Research Document (White et al, 2013).

The remainder of the meeting was spent discussing and summarising the 'lessons learned' and identifying priorities and tools/approaches for Science to further support the implementation of an EAM. This information can be found in detail in the Science Advisory Report associated with this meeting (DFO, 2013).

CONCLUDING REMARKS

The Co-Chairs thanked participants for their input and acknowledged the tremendous amount of work and interesting findings of the Regional ERIs. They noted that in addition to the Science Advisory Report and Research Document from this meeting, a wealth of information is also included in the Regional syntheses for each ERI which are posted on the CSAS website, and in the many other publications that arose from these programs (over 130 as of summer 2013).

REFERENCES CITED

DFO. 2013. National synthesis of the 'Ecosystem Research Initiatives'. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2013/026.

White, A.L.,R.I, Perry, M.A. Koops, R.G. Randall, A. Bundy, P. Lawton, M. Koen-Alonso, D. Masson, P.S. Galbraith, M. Lebeuf, M. Lanteigne, and C. Hoover. 2013. A national synthesis of the Fisheries and Oceans Canada Ecosystem Research Initiative. DFO Can. Sci. Advis. Sec. Res. Doc. 2013/027. v + 31 p.

ANNEX I: MEETING PARTICIPANTS

NAME	DEPARTMENTAL AFFILIATION
Brown, Robin	Manager, Ocean Science; Pacific
Bundy, Alida	Research Scientist; Maritimes
Clemens, Marc	Manager, Fisheries Renewal Policy; National Capital
Comeau, Michel	Research Scientist, Gulf
Galbraith, Peter	Research Scientist; Québec
Hargreaves, Marilyn	Head, CSAS; Pacific
Hoover, Carie	Ecosystem Modeler; Central & Arctic
Koen-Alonso, Mariano	Research Scientist, Newfoundland & Labrador
Koops, Marten	Research Scientist; Central & Arctic
Ladwig, Aleria	Ecosystem Approach Officer; OHEB; Pacific
Lanteigne, Marc	Manager, Aquatic Research; Gulf
Lawton, Peter	Research Scientist; Maritimes
Lebeuf, Michel	Research Scientist; Québec
Masson, Diane	Research Scientist; Pacific
O, Miriam	Research Biologist; Pacific
Paulic, Joclyn	Research Biologist; Central & Arctic
Pepin, Pierre	Research Scientist; Newfoundland & Labrador
Perry, Ian (Co-Chair)	Research Scientist; Pacific
Rothfels, Mary	Manager, Ocean Policy & Planning; National Capital
Stenson, Garry	Research Scientist, Newfoundland & Labrador
Wells, Nadine	Biologist; Newfoundland & Labrador
White, Andrea (Co-Chair)	Science Advisor; National Capital
Wysocki, Roger (Rapporteur)	Science Advisor; National Capital

ANNEX II: TERMS OF REFERENCE

National Synthesis of the 'Ecosystem Research Initiatives'

National Peer Review – National Capital Region

November 14-15, 2012
Sidney, British Columbia

Co-Chairs: Ian Perry & Andrea White

Context

Fisheries and Oceans Canada (DFO) implemented 'Ecosystem Research Initiatives' (ERI) in 2008 as part of its five-year science plan (2008-2013). The ERIs represented seven geographically distinct areas, each with different stressors, and examined science support for DFO's ecosystem-approach to management. The seven ERIs involved integrated research focused on the: 1) Newfoundland Shelf; 2) Gulf of Maine Area; 3) Northumberland Strait; 4) Lower St. Lawrence Estuary; 5) Lake Ontario; 6) Beaufort Sea Shelf; and 7) Strait of Georgia.

The knowledge gained from these large-scale ecosystem studies was intended to inform the development and testing of science-based tools required to assess the impacts of various human activities within Canada's aquatic ecosystems. The general themes within each ERI included: 1) understanding ecosystem processes, 2) understanding the impacts of environmental and climate variability, and 3) developing tools for science support of the Department's ecosystem-approach to management.

The ERIs have concluded and Regional syntheses of their respective research and advice have been produced. This national meeting will discuss the 'lessons learned' from the ERIs in general, examine the current or potential application of these initiatives in support of DFO's ecosystem-approach to management, and provide recommendations on the path forward for ecosystem science in DFO.

Objectives

1. Review and summarize the 'lessons learned' from the ERIs, particularly those with over-arching national relevance.
2. Examine the current or potential application of the research and advice produced through the ERIs on policy and decision-making within the Department, particularly with respect to an ecosystem-approach to management.
3. Based on 2), identify priorities and tools/approaches for science to further support the implementation of the Department's ecosystem-approach to management.

Expected Publications

- Science Advisory Report
- Research Document
- Proceedings

Participation

- DFO Science
- DFO Management and Policy Sectors

ANNEX III: MEETING AGENDA

National Synthesis of the 'Ecosystem Research Initiatives'

November 14-15, 2012; Sidney, BC

Meeting Chairpersons: Ian Perry & Andrea White

Wednesday, November 14, 2012

Time	**Topic**
9:00	Welcome and Introductory Remarks *(Co-Chairs)*
9:15	Strait of Georgia ERI Presentation *(Pacific Region)*
9:45	Beaufort Sea ERI Presentation *(Central & Arctic Region; Winnipeg)*
10:15	*Health Break*
10:30	Lake Ontario ERI Presentation (*Central & Arctic Region; Burlington*)
11:00	Lower St. Lawrence Estuary ERI Presentation (*Québec Region*)
11:30	Northumberland Strait ERI Presentation *(Gulf Region)*
12:00	Gulf of Maine ERI Presentation *(Maritimes Region)*
12:30	*Lunch (not provided)*
13:30	Newfoundland Shelf ERI Presentation (*Newfoundland and Labrador Region)*
14:00	Discussion - Review and summarise 'lessons learned', particularly those with over-arching national relevance
15:30	*Health Break*
15:30	Discussion - Current or potential application of the research and advice produced through the ERIs on Departmental policy and decision-making
17:00	Adjournment of Day 1

Thursday, November 15, 2012

Time	Topic
9:00	Summary of Day 1 and Overview of Day 2 Agenda *(Co-Chairs)*
9:15	Discussion – Identification of priorities and tools/approaches for science to further support the implementation of the Department's ecosystem-approach to management.
10:30	*Health Break*
10:45	Discussion - Review and approval of working paper
12:00	*Lunch (not provided)*
13:30	Drafting of the Science Advisory Report (continued…)
15:00	*Health Break*
17:00	Adjournment of Day 2