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**Environmental Information: Use and Influence**

## Does Information Matter? A Critical Question for the Future of Coastal Zone Management

Special Session  
8:30 am – 12:00 pm, Tuesday, 17 June 2014

*Our Coasts: Legacies & Futures*  
Coastal Zone Canada 2014 Conference

Halifax, Nova Scotia  
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## **Does Information Matter? A Critical Question for the Future of Coastal Zone Management**

*Session Abstract:* This session presents interdisciplinary perspectives on the challenges of communicating scientific information to users, e.g., policy makers, decision makers, and resource managers, for integrated coastal and ocean management (ICOM). For several decades, coastal and ocean managers have developed the theory and practice of ICOM. But while ICOM is regarded as highly complex, the vital role of information in solving environmental and societal problems receives much less recognition. Furthermore, in spite of the increasing quantity of available scientific information published as primary and grey literature, in print and digital formats, the ability to solve coastal and marine environmental problems appears to be decreasing. Why? Will this situation worsen or can it be turned around? What characterizes the information activities occurring at the science-information-policy interface? What factors influence awareness and use of information and knowledge in policy-making contexts? Presenters will draw upon their expertise to address these and other questions aimed at resolving the disconnect between the availability and potential use of information, and problem resolution. The session will cover historical perspectives of the contribution of science to policy, the changing information landscape, methods for measuring information use, global environmental governance related to information use, evidence-based policy making, and characteristics of the science-policy interface.

### **Paper 1**

*Authors:* **MacDonald, Bertrum H.,<sup>1</sup> Wells, Peter G.,<sup>1</sup> De Santo, Elizabeth,<sup>2</sup> & Soomai, Suzette S.<sup>1</sup>**  
<sup>1</sup>Dalhousie University, Halifax, Nova Scotia; <sup>2</sup>Franklin & Marshall College, Lancaster, Pennsylvania

*Title:* **Bridging the Science-Policy Gap in Marine Environmental Management**

*Abstract:* This paper will introduce the special session “Does Information Matter” for coastal zone management organized by the Environmental Information: Use and Influence (EIUI) interdisciplinary research initiative at Dalhousie University. The role of information in solving environmental and societal problems has received little recognition, particularly in the highly complex subject of coastal zone management. Moreover, in spite of the growing quantity of available scientific information, the ability to solve coastal and marine environmental problems does not appear to be increasing. How management advice is used in policy-making is not clear. How do policy-makers determine what is the “right” information, how do they interpret scientific advice, what is the role of various actors in information use in the policy process, what are the indicators of information use or influence in this process? Such questions are guiding studies on knowledge mobilization at the science-policy interface, including data accessibility and use, and information management in policy contexts. The work of leading experts and research initiatives, such as EIUI, can increase understanding and provide insights to bridge the science-policy gap. The paper will present an overview of historical and contemporary thought on the science-policy interface including the characteristics and interpretations of the interface, information use related to global environmental governance, evidence-based policy making, the main challenges to information use, methods to identify the challenges and opportunities for information use in policy contexts, and existing and emerging tools to connect science and policy.

## **Paper 2**

*Author:* **Ascher, William**, Claremont McKenna College, Claremont, California

*Title:* **Inducing More Effective Stakeholder Searches for Sound Environmental Information**

*Abstract:* Over the past several decades there has been remarkable progress in generating useful information relevant to environmental decision making. While there are still challenges in the generation of sound environmental information, it is clear that the “uptake” of sound environmental information has not kept up with its supply. Citizens, resource-users and policymakers too often rely on inadequate or inappropriate environmental information. There is no shortage of possible reasons for this: proliferation and spread of unsound information, confusion over reliability of sources, information glut in general, overly technical information, issue fatigue, etc. The problem has been addressed largely by asking how sound information can be packaged and delivered more effectively. Yet the problem also has to be addressed from the other side: how to induce more effective stakeholder searches. Numerous potential approaches include the content and format of the information, but go beyond that to strategies of social interaction.

Therefore this paper will explore the following question: What approaches can governments, NGOs, researchers, or others use to induce people to extend their information searches, both temporally and in scope, to secure an adequate understanding of the consequences of their actions and of policy alternatives that affect the environment?

## **Paper 3**

*Author:* **Hartley, Troy**, College of William and Mary, Gloucester, Virginia

*Title:* **In the Eye of the Beholder: Scientific Uncertainty and Information Flow in Fisheries and Land-Use Governance Networks**

*Abstract:* Scientific uncertainty in fisheries science has negatively impacted management deliberations, and considerable effort has been put to reducing uncertainties in scientific models and developing new mechanisms to discuss uncertainty. While some fisheries scientists have argued that an over-emphasis on uncertainty can lead to management paralysis, others have found that a lack of openness and transparency about uncertainty can undermine credibility of the science. The salience, credibility, and legitimacy of scientific information have been shown to be critical factors driving the use of science in fisheries management. At the same time, communication research reveals that the public can interpret scientific uncertainty as a poor understanding of the topic and those who communicate about uncertainty are untrustworthy, while scientists view estimation of uncertainty as reflecting a deeper understanding, and more credible science. In sum, the social science paints a confounding picture; uncertainty is not an insurmountable barrier to effective communication and use of science, but different stakeholder audiences respond differently to the same message. We examine fisheries and land-use communication and influence networks to illustrate the nature of scientific information flow and impact in decision-making, the impact of multi-stakeholder network structure and function on information flow and influence, and the challenges and opportunities for building salience, credibility and legitimacy. Subgroups of experts, boundary spanners, and other connectivity roles among network members drive the flow of information and contribute to the influence of the scientific information they supply. Ramifications for integrated coastal and ocean management and fisheries management are discussed.

#### **Paper 4**

*Author:* **McNie, Elizabeth**, University of Colorado, Boulder, Colorado

*Title:* **Designing Outcome-Oriented Research to Improve the Relevance of Environmental Science for Policy**

*Abstract:* Research in science policy has demonstrated consistent challenges in effectively linking environmental science with decision making. Some of these challenges are due to different cultures, epistemologies and priorities that separate science from policy. But one underlying challenge relates to the fact that most environmental-science research is undertaken in a mode consistent with a linear model of science policy, one that elevates the purpose and value of knowledge inquiry over the relevance of knowledge to inform decision making. Moreover, scientists often believe that if decision makers had more knowledge they would make better decisions, when in fact more research, that lacks relevance to the policy problem, fails to adequately inform decisions. This presentation will identify some of the challenges inherent in undertaking policy-relevant research and then explore ways that scientists and their organizations can re-shape their research agendas and organizational processes in ways that can increase the relevance and social value of the knowledge they produced. The design and function of boundary organizations and necessary human capital to facilitate engagement between science and policy will also be discussed.

#### **Paper 5**

*Author:* **De Santo, Elizabeth**, Franklin & Marshall College, Lancaster, Pennsylvania

*Title:* **Communicating Complex Environmental Information in Political Contexts: Lessons Learned from the IPCC for IPBES and Marine Biodiversity Conservation**

*Abstract:* Global biodiversity is declining at an unprecedented rate, requiring political action on multiple fronts, from the local to national and international levels. Established in 2012, the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) will provide a scientific advisory role for the UN Convention on Biological Diversity analogous to that provided by the Intergovernmental Panel on Climate Change (IPCC) to the UN Framework Convention on Climate Change. The IPCC has encountered significant controversy in its fifteen-year history, including attacks on its credibility and on the quality of the information it has produced. This paper will examine the legacy of the IPCC's experience with communicating science to political and general audiences, and resulting opportunities and challenges for the developing IPBES process. According to its mandate, IPBES will aim to strengthen capacity for the effective use of science in decision-making at all levels. While communicating science on climate change has significant political challenges as evidenced by the controversies weathered by the IPCC, the IPBES's approach, pooling biodiversity and ecosystem services, may open the door to debates on issues including (1) valuing nature and (2) biodiversity offsets, both of which take an anthropocentric view of biodiversity conservation and are mired in controversy. Drawing on examples of science communication in spatial approaches to marine biodiversity conservation, such as Marine Protected Areas, this paper will provide an opportunity to think strategically about possible pitfalls while the IPBES's approach and mechanism is still in an early stage of development.

## Paper 6

*Authors:* **Soomai, Suzuette S.**, Dalhousie University, Halifax, Nova Scotia

*Title:* **Measuring Use of Fisheries Information in Policy-Making for Fisheries Management**

*Abstract:* Evidence-based policy-making is a complex process in which scientific knowledge interacts with other types of knowledge, e.g., local knowledge, in addition to a range of factors including personal and institutional interests and values of multiple stakeholders. Studies on the use of marine fisheries information in policy-making are limited and these studies indicate a limited use of fisheries scientific information in the policy process to effect fisheries management.

This paper describes doctoral research which seeks to address the gap in the knowledge of the role of available fisheries scientific information in policy-making for marine fisheries management. The research aims to develop an understanding of the role(s) of fisheries scientific information, produced by governmental and intergovernmental organizations in influencing policy decisions by identifying instances where information is or can be used in fisheries policy development and management decisions and by identifying the main actors involved.

Research includes case studies of three inter-related organizations – the UN Food and Agriculture Organization, Northwest Atlantic Fisheries Organization, and the Canada Department of Fisheries and Oceans. The research utilizes mixed-methods, including mainly qualitative methods, to understand the production and use of fisheries scientific information within each organization. Methods include surveys of key actors, direct observations at relevant science and advisory meetings, and content analysis of key scientific publications. The findings will develop models of information flows and a tested methodology for assessing information use. The research will be one of the first comprehensive studies within governmental organizations on the role of fisheries scientific information in policy-making.

## Paper 7

*Author:* **Graham, Janice**, Dalhousie University, Halifax, Nova Scotia

*Title:* **Just Evidence: Governing Knowledge by Opening Data**

*Abstract:* Evidence-based policy weakened to evidence-informed policy has reached a critical turn, exposed as conflicted by science that lacks transparency and accountability. Growing public attacks by scientists, across disciplines, concerned about industry and ideological doctoring and the blocking of data from independent expert critical review, have showcased politics in the process of research design and analysis. Public trust in corporatized science, in the making and uses of medicines, in research and health service “enterprises,” is in decline worldwide. Social media have opened the window to both witness and respond to the techno-political interventions that disrupt and poke holes into ecosystems. Context counts in these systems; epigenetics is unlocking new human and non-human kinds co-evolving from the matrices of biologies, environments, and socio-biopolitics. Particular assemblages of architects and institutions construct and authorize the scientific instruments used to define certainty and kinds of truth. They determine the allowable margins for uncertainty, for whom and what is measured in health, therapeutics, and environments, for what counts as evidence. A morally engaged anthropology can lend critical ethnographic interrogation to these assemblages of science and technologies. It maps the local-global interstices connecting bio-political cultures to human and non-human becomings, and roots out the values attached to life. Values that are not always economic. Structural adjustments that have produced unsustainable and

inequitable economic gains and capital accumulation have promoted the interested authorization of evidence. Let us consider how we might engage in the development of moral policies that govern and defeat unjust perversions to expert knowledge.

## **Paper 8**

**Authors:** Ross, James,<sup>1</sup> & Heather Breeze<sup>2</sup>, <sup>1</sup>Dalhousie University, Halifax, Nova Scotia, <sup>2</sup>Department of Fisheries and Oceans, Halifax, Nova Scotia

**Title:** *Awareness and Use of State of the Environment Reports: A Case Study of the State of the Scotian Shelf Report*

*Abstract:* Over the past 40 years, various governments, non-governmental organizations, and inter-governmental partnerships have produced State of the Environment (SOE) reports. These reports aim to provide comprehensive accounts of available scientific information for particular ecosystems, in order to provide decision making support to policymakers. However, in recent years, concern has arisen about the extent to which these reports are actually used.

The Environmental Information: Use and Influence research initiative, in collaboration with the Canada Department of Fisheries and Oceans (DFO), has conducted a case study investigating the awareness and use of the *State of the Scotian Shelf Report*, a regional SOE report co-published by DFO and the Atlantic Coastal Zone Information Steering Committee (ACZISC). Subscribers of ACZISC's Coastal Update Newsletter, the primary audience for promotion of the report, were surveyed, as were other target groups. The surveys, along with the results of other analytics, were used to assess the degree to which the document is being used to support decision making by the target audience.

Results of the study will be presented, and recommendations will be provided for the development, format, and promotion of State of the Environment reports generally.

## **Paper 9**

**Authors:** Wells, Peter G.,<sup>1</sup> De Santo, Elizabeth M.,<sup>2</sup> & MacDonald, Bertrum H.<sup>1</sup>

<sup>1</sup>Dalhousie University, Halifax, Nova Scotia; <sup>2</sup>Franklin and Marshall College, Lancaster, Pennsylvania

**Title:** *Does Information Matter? Identifying Critical Issues Related to Information Use in ICOM (Integrated Coastal and Ocean Management)* - Panel Discussion.

*Abstract:* This paper has two objectives: (1) to present highlights of papers from the special session "Does Information Matter" for CZM (coastal zone management) and ICOM (integrated coastal and ocean management); and (2) to initiate discussion of critical issues related to future evidence-based policy and decision making for the oceans. Topics covered during the preceding talks will include: the rationale behind the EIUI (Environmental Information: Use and Influence) project with its focus on marine environmental and fisheries information (MacDonald and EIUI team); why people should extend information searches in order to understand the consequences of their actions and the policy alternatives (Ascher); international attention being given to understanding and resolving problems at the science-policy interface, through an analysis of activities within the IPCC (Intergovernmental Panel on Climate Change) and their application for the nascent IPBES (Intergovernmental Platform on Biodiversity and Ecosystem Services) (De Santo); ensuring public

trust in policy and decision making in the health professions by governing knowledge with open data (Graham); recognizing that salience, credibility and legitimacy of scientific information are critical to the use of science in fisheries management (Hartley); and defining the future for the role of information in all aspects of managing the oceans and ICOM, recognizing its human (social), ecological and economic dimensions (Soomai, McNie, Ross and Breeze). The paper initiates the panel discussion with the session's invited speakers, to provide a working roadmap for elevating the vital role of information to the front lines of ICOM.

### **Posters by EIUI research team members**

*Authors:* **Avdic, Vanja,<sup>1</sup> MacDonald, Bertrum H.,<sup>1</sup> Farmer, Tina,<sup>2</sup> Kalentsits, Maria,<sup>2</sup> & Grainger, Richard<sup>2</sup>**

<sup>1</sup>Dalhousie University, Halifax, Nova Scotia; <sup>2</sup>Food and Agriculture Organization, Rome

*Title:* **The Value of Global Overview Reports: A Case Study of the Use of *The State of World Fisheries and Aquaculture* Published by the Food and Agriculture Organization**

*Abstract:* To effectively address environmental management issues through policy changes, informed decision-making is required. But communication of scientific information may be a barrier to evidence-based policy-making. Global overview reports, such as the UN Food and Agriculture Organization's (FAO) *The State of World Fisheries and Aquaculture* (SOFIA), are significant sources of synthesized and authoritative scientific information. SOFIA is designed to provide reliable information regarding fisheries and aquaculture, which could be used in policy formulation and implementation of best practices. Despite being a major global information source, published in biennial editions since 1994, an assessment of whether SOFIA has been used and/or influenced policy development has never been undertaken. This poster reports on a study, conducted by the Environmental Information: Use and Influence research initiative at Dalhousie University in collaboration with FAO, to measure and understand the use of SOFIA, primarily through citation and content analysis. Searches revealed 6454 unique citations to SOFIA. From a variety of sources and publishers, these citations confirm extensive use worldwide. The data also illustrate various types of use and reasons that SOFIA was cited. The results led to several recommendations for improved dissemination of the information published in SOFIA, including guidance on how to structure future editions as well as a methodology to assess the use of other FAO publications. Furthermore, this research demonstrates the importance of determining how scientific information is used in order to facilitate effective dissemination of such information so as to better inform policy decisions and enhance implementation of best practices.

*Author:* **Roy, Andrew**, Dalhousie University, Halifax, Nova Scotia

*Title:* **Working Towards Objectivity and Accuracy: The Process of Producing Environmental Impact Statements in the Digby Neck Quarry**

*Abstract:* Information deficits, federalism, and neo-liberalism have all reduced the role of North American government and governmental regulatory bodies in their ability to deal with the ever-increasing and complex environmental (scientific and technological) information. As a result, North American governmental bodies often contract with third-party groups associated with private industry to conduct exhaustive and extensive environmental impact assessments. Such partnerships between private industry and governmental bodies have resulted in interested parties claiming that environmental documents produced from these assessments lack the accuracy and objectivity that

scientific research necessitates. A previous case study of the information surrounding the Keystone XL pipeline argued that these claims are less concerned with the document itself and more concerned with the process in which that document was created. Through a close study of the Digby Neck Quarry, this poster investigates the process in which these documents are produced. It analyzes the role of and interactions between governmental bodies, private industry, environmental groups, and other involved communities. The poster will provide a concrete exploration of the relationship between the perception of the objectivity and accuracy of environmental documents with the process that produced these documents. Through investigating this contemporary coastal zone issue as a case study, this poster emphasises the changing role of the Canadian government in environmental management issues and the processes that produce objective and accurate environmental impact assessments.