

Sobey Fund for Oceans



The Marine Affairs Program Dalhousie University

PRESENTS THE

Sustainable Oceans Conference 2014

Transforming a Sea of Knowledge into Effective Management

The conference is a key activity of the Sobey Fund for Oceans.
The Fund is a unique partnership between the Marine Affairs Program
(MAP), Dalhousie University and WWF Canada

April 11th

Potter Auditorium and Atrium
Kenneth Rowe Management Building,
6100 University Avenue

April 12th

Life Science Centre Room 236,
and Ocean Sciences Building Atrium
1355 Oxford Street



April 11	Program	Kenneth Rowe Management Building: Atrium & Potter Auditorium (6100 University Ave.)
6.00	Reception	Registration and poster viewing
6.30	Welcome	Opening remarks: Dr. Chris Moore, Dean, Faculty of Sciences Dr. Robert Fournier, Interim Director, Marine Affairs Program
	Sobey Fund for Oceans	Scholarship overview: Dr. Robert Rangeley, VP of Science, Research & Innovation, WWF Canada
		Presentation of Scholarship Award to Manuel Dureuil, Julie Hovey, & Maryann Watson by Mr. Robert Sobey
6.50	Film Introduction	Honour Song: Shelley Young Film Introduction: Martha Steigman
7.10	Film	<i>Seeking Netukulimk</i>
7.55	Panel Discussion	Panelists: Kerry Prosper , Mi'kmaq Elder, Pipe Carrier, and member of the Paq'tnekek Mi'kmaq First Nations Sherry Pictou , Interdisciplinary PhD student at Dalhousie University, Associate Staff for the Bay of Fundy Marine Resource Centre, and Co-Chair of the World Forum of Fisheries Peoples; Fred Metallic , Senior Policy Analyst with Listuguj Mi'gmaq Government, Ph.D. in Environmental Studies
	Moderator	Moderator: Dr. Claudio Aporta, Marine Affairs Program
8.45	Closing remarks	Nicolas Winkler (Conference Chair)
9.00	End of Program	

April 12	Program	Ocean Sciences Building Atrium 1355 Oxford Street
8.30	Registration	Poster viewing
8.55	Welcome	Shelby MacLean, MASS President
9.00	Session I	Presentations (LSC 236): <ul style="list-style-type: none"> • <i>Sustainability & Knowledge Systems</i> • <i>Marine Governance, Policy & Law</i> • <i>Communication Between / Among Stakeholders & Policy Makers</i>
10.30	Break	Poster viewing
10.45	Session II	Presentations (LSC 236): <ul style="list-style-type: none"> • <i>Addressing Uncertainty in the Marine Environment</i>
12.15	Lunch	Poster viewing / judging
1.15	Interactive Symposium (See p. 7)	Rotating Concurrent Sessions (30 mins each) Session 1 (DOSB 2-22): Exploring Knowledge & Sustainability through Language Facilitators: Shelley Young & Marina Young Session 2 (Ocean Sciences Building Atrium): Visualizing Thematic Concepts Facilitator: Susan MacLeod Session 3 (LSC 236): Town Hall Meeting Simulation Facilitators: Cameron Christensen, Danielle Scriven, Stacie Sybersma & Alana Vineberg
3.10	Break	Poster viewing
3.30	Closing	Prizes & Acknowledgments
5.00	End of Program	



"I have a long history with both Dalhousie and WWF. It became clear to me that collaboration between our brightest young minds and our leaders in conservation is the key to solving some of the great challenges in our oceans. And that's a goal that I share with both Dalhousie and WWF."
Donald Sobey, The Donald R. Sobey Foundation.

Sustainable Oceans Conference

Transforming a Sea of Knowledge into Effective Management

Marine Affairs Student Conference, April 11-12, 2014

The key goal of the 2014 Sustainable Oceans Conference is to explore the knowledge and policy interface. As such, this student-led conference aims to achieve this by acknowledging different knowledge systems and exploring how they work to inform policy making. We hope that by identifying the challenges at this interface, we can work toward sustainable ocean management solutions in Canada.

Special objectives of the conference are to:

- Identify challenges currently facing the knowledge-policy interface in oceans management in Canada and to collaboratively identify solutions
- Provide students with the opportunity to practice their presentation skills, publish their work in an online technical series and to network with other involved in the field of ocean management.
- Provide an exciting, innovative, and interactive platform for participants and professionals alike to learn from one another.
- Bring together all sectors of ocean management and the wider community to explore and collaborate to achieve greater management solutions.

Contact Details: Nicolas Winkler
Email: OceansConf@dal.ca;
Wiki: <http://soceans.wiki.dal.ca>;
Twitter: [@SustOceans2014](https://twitter.com/SustOceans2014)



The conference is a key activity of the Sobey Fund for Oceans. The Fund is a unique partnership between the Marine Affairs Program (MAP), Dalhousie University, and WWF Canada.

Welcome!

Dear Attendee,

On behalf of the 2013-2014 Marine Affairs Student Society (MASS) we would like to warmly welcome you to the **2014 Sustainable Oceans Conference: Transforming a Sea of Knowledge into Effective Management.**

Society today has an extensive supply of information available from a diversity of disciplines concerning the issues that affect our oceans. Scientific knowledge, local knowledge, indigenous knowledge and personal experiences are some of the approaches used to understand the marine environment and our interactions with it. The interface at which these various knowledge sources and policy meet, represents one of the greatest challenges to achieving effective management strategies for the sustainable future of our coasts and oceans.

We would like to acknowledge our presence in Mi'kma'ki, the traditional territory of the Mi'kmaq people. We are honoured to take part in the discussion facilitated by the film *Seeking Netukulimk*, and believe that the themes explored will contribute to the sustainability of our oceans.

In a world where the challenges facing our oceans are often framed as insurmountable, our aim has been to approach these difficult challenges with positivity. We sincerely hope our conference will provide a collaborative platform for all voices to be heard. We are optimistic that you will leave this conference knowing that there are meaningful solutions for a more sustainable future and that every one of us has a role to play in bringing about positive change.

We thank you for your support and participation.

Sincerely,

The MASS Event Standing Committee 2013-2014

Film Screening and Panel



Film Introduction: Dr. Martha Steigman, Co-director of *Seeking Netukulimk*

Martha Stiegman is a passionate and engaged community-media and documentary filmmaker. Currently based in Halifax, her work has screened in festivals around the world from Tunisia and New Zealand to Brazil. Her first two documentaries, *In Defense of our Treaties* (2007) and *The End of the Line* (2007) explore alliances between Mi'kmaq and non-native fishing communities in her home province of Nova Scotia. *Seeking Netukulimk* (2013) is a lyrical

exploration of the traditional laws that govern fishing in the Mi'kmaq world, and some of the political battles that have been fought to defend them.

Martha Stiegman holds a Bachelors of Arts from McGill University in English Literature and Political Science, and an interdisciplinary PhD-Special Individualized Program from Concordia University.



Panel Member: Kerry Prosper, Co-director of *Seeking Netukulimk*

Kerry Prosper is a Mi'kmaq Elder, Pipe Carrier, and member of the Paq'tnekek Mi'kmaq First Nations community located along the shores of St. Georges Bay not far from Antigonish, Nova Scotia. Prosper served as Chief of his community for twelve years and is presently an elected Councillor. Kerry is currently the research coordinator for the Paq'tnekek First Nation in the Social Research for Sustainable Fisheries project. In this role, he works with the Paq'tnekek Fish and Wildlife Society and St. Francis Xavier University.



Panel Moderator: Dr. Claudio Aporta, Marine Affairs Program

Originally from Argentina, Claudio Aporta obtained his Ph.D. in Anthropology from the University of Alberta. He was a SSHRC postdoctoral fellow at Université Laval, and an assistant and associate professor in the Department of Sociology and Anthropology at Carleton University. Since 2013, he is an associate Professor at the Marine Affairs Program.

His research has mostly focused on how Inuit relate to coastal and marine areas of the Canadian Arctic. His research interests are now connected to coastal sustainable communities, co-management, spatial analysis, historical GIS, and indigenous knowledge and use of marine areas.

Panel Members



Panel Member: Sherry Pictou, Interdisciplinary PhD Candidate, Dalhousie University

Sherry Pictou has volunteered and worked in various capacities for a number of First Nations organizations and in particular, for her home community the Bear River First Nation, Nova Scotia. Much of this work has involved political and activist advocacy for the right to initiate community approaches to natural resource harvesting, restoration, and management based on Mi'kmaq perspectives.

She has been active in several cross-cultural learning projects with non-First Nations fishers, a Canadian Coastal Learning Network and the Bay of Fundy Marine Resource Centre. Currently, Sherry is an Interdisciplinary PhD student at Dalhousie University, serves as associate staff for the Bay of Fundy Marine Resource Centre, and is Co-Chair of the World Forum of Fisheries Peoples, a global social movement network of small-scale fisher people.



Panel Member: Dr. Fred Metallic, Senior Policy Analyst, Listuguj Mi'gmaq Government

Fred Metallic is resident of Listuguj and a lifetime citizen of Gespe'gewa'gi, Mi'gma'gi. In 2011 Fred graduated from York University and obtained his Ph.D. in Environmental Studies. His dissertation, written and defended in Mi'gma'gi in Listuguj was a landmark achievement. This was the first time a dissertation was written solely without translation in an indigenous language.

He has written and presented numerous to Mi'gmaq and non-Mi'gmaq communities, on topics related to Mi'gmaq history, Mi'gmaq political philosophy, culture, spirituality and governance. Fred also sits on the Mi'gmaq Grand Council as a Ge'ptin and works closely with the leadership in the advancement of our rights and responsibilities as a nation.

Fred is currently working with the Listuguj Mi'gmaq Government as a senior policy analyst. Fred, his wife Amy, and their three children – Emma, Je'gopsn and Erika – live in the Mi'gma'gi community of Listuguj.

Interactive Symposium

Time: Saturday 1:15pm – 3:15pm

Objective: The interactive sessions are designed to allow the conference participants to explore, learn and interact with the conference sub-themes. These sessions will allow participants to gain a better understanding of the challenges faced in managing ocean issues and formulating policy by gaining first hand interactive experiences.

Format: The afternoon symposium will comprise three concurrent interactive sessions lasting 30 minutes each. After each session is completed, the participating groups will be rotated to the next session allowing participants to explore each session. You will be placed into three groups during the lunch hour and each group will be provided with a chaperone to guide you to the next session. Please note, you may only attend each session once.

Session 1: Exploring Knowledge & Sustainability through Language

Facilitators: Shelley Young, Marina Young & Marine Affairs Students

Location: Dalhousie Ocean Sciences Building - Room 2-22

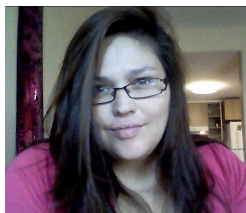
Theme: Knowledge Systems & Sustainability

Purpose: The Mi'kmaq worldview is embedded within the Mi'kmaq language, which weaves together both culture and teachings. This interactive session will provide insight and cross-cultural understanding through an exploration of the Mi'kmaq language.



Shelley Young is a Mi'kmaq mother from Eskasoni First Nation. She and her daughter live in Halifax where she teaches Mi'kmaq at the Mi'kmaq Child & Development Center, and is a Regional Project Coordinator for The Centre for Pediatric Pain Research at the IWK. She has guest lectured at various universities, been published, recognized as a "Peace & Social Justice Leader" by the EAC, and was chosen as a "Millennial Leader" in NS recently for her activism in Aboriginal rights awareness, water protection and environmental preservation. Shelley was chosen to represent Indigenous women by the Native Women's

Association of Canada in 2013 for the United Nations Permanent Forum on Indigenous Issues in NYC. She's committed to preserving her culture, language, teachings and protecting our natural resources.



Marina Young is a proud Mi'kmaq mother from Eskasoni First Nation. She lives in Eskasoni with her partner and 5 year old daughter, Emma. Marina studied at Dalhousie University, owns her own business in Eskasoni and teaches the Mi'kmaq language at the Mi'kmaq Child & Development Centre in Halifax. She has been an active community member, and an advocate for the preservation of Mi'kmaq language and culture.

Interactive Symposium

Session 2: Visualizing Thematic Concepts

Facilitator: Susan MacLeod & Marine Affairs Students

Location: Dalhousie Ocean Sciences Building Atrium

Themes: *Group 1:* Law, governance & policy; *Group 2:* Uncertainty in the marine environment; *Group 3:* Stakeholder engagement & policy

Purpose: Explore the conference's sub-themes via a moderated discussion. A visual graphic facilitator will transform the group's discussion, thoughts, views and feelings graphically. Explore how your understanding of the themes come together and evolve through discussion, sharing and collaboration. This will give you an insight into the multitude of factors that are required to transform a sea of knowledge into effective management.



Susan MacLeod, Graphic Facilitator, MacLeod Allen Creative Services

Susan records meetings and keynote speakers in real time using words and pictures on large mural-size pieces of paper. This is called graphic facilitation or graphic recording. Graphic Facilitation helps people know they have been heard and participants can see connections that might otherwise have gone unnoticed. Research has shown graphic facilitation increases retention of information and improves attention during an event.

For a clearer focus, consider graphic facilitation at your next gathering.

Read more at: ca.linkedin.com/in/susanmacleod/

Contact her at: susan@drinkpropeller.ca, 902-293-1103

Session 3: Town Hall Meeting Simulation

Facilitator: Marine Affairs Students

Location: Dalhousie Ocean Sciences Building Atrium

Themes: Stakeholder engagement & policy

Purpose: Experience first the complex range of views and perspectives that professionals and community members bring to issues that affect both the oceans and society through a simulated town hall scenario in which you get to question and challenge the panel.

Scenario: Last week Nova Scotia discovered vast new reserves of oil off the Scotian Shelf and is anticipated to provide game changing economic opportunity for the province. It will turn Nova Scotia from a 'have not' to a 'have' province and with it transform the wider Maritimes. The potential benefits are massive, but are there risks involved in this potential prosperous venture? Who thinks what? Who gets to have a say? How should policy be formulated? The roles that will be played by MMM students in this simulation are a moderator, an environmental NGO scientist, an MLA for a liberal political party, and an Offshore Petroleum Board representative.

Conference Committees and Volunteers

Event Standing Committee

Nicolas Winkler (Conference Chair), MMM Candidate
Sarah Chamberlain (Logistics Chair), MMM Candidate
Shelby MacLean (MASS President), MMM Candidate
Chloe Ready (Promotion Chair), MMM Candidate
Danielle Scriven (Content Chair), MMM Candidate
Alana Vineberg (MASS Treasurer), MMM Candidate
Liz Wilson (Conference Coordinator), IDPhD Candidate

Promotion Committee

Shelby McLean, MMM Candidate
Sonia Jind, MMM Candidate
Alana Vineberg, MMM Candidate

Content Committee

Amber Giles, MMM Candidate
Elise Will, MMM Candidate
Sonia Jind, MMM Candidate
Ainsley Allen, MMM Candidate
Sarah Chamberlain, MMM Candidate

Logistics Committee

Cameron Christensen, MMM Candidate
Stacie Sybersma, MMM Candidate
Randel Thompson, MMM Candidate

Judges

Oral Presentations

Robert Fournier

Interim Director
Marine Affairs Program
Faculty of Science
Dalhousie University

Tamara Wilson

MMM Candidate
Marine Affairs Program
Dalhousie University

Stephanie A. Boudreau

Fish-WIKS Post Doctoral Fellow
Marine Affairs Program
Dalhousie University

Stacie Sybersma

MMM Candidate
Marine Affairs Program
Dalhousie University

Poster Presentations

Jenny Baechler

Associate Director
Corporate Residency MBA
Course Coordinator
Management Without Borders
Dalhousie University

Alanna Gauthier

Principal
NEXUS Coastal Resource
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Table of Contents

Program	1
Welcome	4
Film Screening and Panel Members	5
Interactive Symposium and Facilitators	7
Conference Committees and Judges	9
 Session 1: Sustainability and Knowledge Systems / Marine Governance, Policy & Law / Communication Between and Among Stakeholders & Policy Makers	 12
Combining biological science and local ecological knowledge (LEK) to assess the dynamics of eelgrass (<i>Zostera marina</i>) in Port Mouton Bay, Nova Scotia, in relation to finfish aquaculture development <u>Sonya Lee</u> , Department of Biology, Dalhousie University	12
Out of the same waters: Contemporary relations between Mi'kmaq and Settler fishers <u>Caitlin Krause</u> , Department of Sociology and Social Anthropology, Dalhousie University	13
Alternative dispute resolution: Can it advance the stated policies of integrated coastal zone management in Canadian fisheries and oceans? <u>David Foster</u> , Department of Biology, & College of Sustainability, Dalhousie University	14
 Session 2: Addressing Uncertainty in the Marine Environment	 15
The environmental risks of shipping in Canada's Arctic <u>Leah Beveridge</u> , Marine Affairs Program Alumna, Dalhousie University	15
Seasonal migration of the American lobster through the FORCE tidal turbine test site, Minas Passage, Bay of Fundy <u>Kaycee Morrison</u> , Department of Biology, Dalhousie University	16
Passive acoustic monitoring of cetaceans at intertidal weirs in Minas Basin, Nova Scotia <u>Monica Reed</u> , Earth and Environmental Science, Acadia University	17
 Poster Presentations	 18
 Sub theme: Sustainability and Knowledge Systems	 18
A guide for integrating <i>Inuit Qaujimajatuqangit</i> into decision-making for marine shipping development in Nunavut <u>Andrea Flynn</u> , Marine Affairs Alumna, Dalhousie University	18

Table of Contents

Sub theme: Marine Governance, Policy & Law	19
The tragedy of the independent: Public policy and traditional recruitment in Nova Scotia's small boat fishery	19
<u>Jessica MacIntosh</u> , Marine Affairs Alumni, Dalhousie University	
Sub theme: Communication Between / Among Stakeholders and Policy Makers	20
Uncovering the real versus perceived issues within the Canadian Atlantic seal fishery	20
<u>Karine Duffy</u> , School for Resource and Environmental Studies, Dalhousie University	
Communicating the ocean: Engaging public interest and action around ocean issues	21
<u>Bloudoff, N., Cottreau, C., Davis, M., Dougherty, M., Gillis, L., & Vigna, A.</u> , Dalhousie University	
Strengthening ocean education in Nova Scotia high schools: Building our future ocean champions	22
<u>Karen Devitt, Melissa Archibald, Alison Froese-Stoddard, Christine Stortini, Amanda Iadipaolo, & Christina Goudy</u> , Dalhousie University	
Sub theme: Addressing Uncertainty in the Marine Environment	23
Emergency management response after coastal disasters: The role of ICZM in mitigating the impacts of large-scale events	23
<u>Anna Naylor</u> , Marine Affairs Alumna, Dalhousie University	
Microplastic fibers in the intertidal ecosystem surrounding Halifax Harbor, Nova Scotia	24
<u>Alysse Mathalon</u> , Department of Oceanography, Dalhousie University	
The Sobey Fund for Oceans Scholarship Recipients	25
The Sobey Fund for Oceans Committee	26
Marine Affairs Program	26
WWF Canada	27
Acknowledgements	28

Oral Presentations

Sustainability & Knowledge Systems

Combining biological science and local ecological knowledge (LEK) to assess the dynamics of eelgrass (*Zostera marina*) in Port Mouton Bay, Nova Scotia, in relation to finfish aquaculture development

Sonya Lee, Department of Biology, Dalhousie University
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Open-net finfish aquaculture has been subject to immense scrutiny over the past few decades due to its environmental impacts on the local marine environment. One part of the ecosystem the fish farms can affect is the benthos of shallow protected bodies of water, which often provide habitat for eelgrass (*Zostera marina*). In Port Mouton Bay (PMB), Nova Scotia, an open-net finfish aquaculture farm was introduced in 1994. In 2009 the site was fallowed and a year later, the local community members observed the reoccurrence of eelgrass beds in the vicinity of the farm. Although the local community conservation group, the Friends of Port Mouton Bay (FPMB), have been monitoring the extents and conditions of the eelgrass beds adjacent to the fish farm since 2011, there are no records of eelgrass presence and extent prior to the fish farm's establishment or in other areas of the Bay.

This study combines biological eelgrass monitoring data from the Friends of Port Mouton Bay, and the local ecological knowledge (LEK) of local fishermen and other community members. These two knowledge types will be used to describe the long-term timeline of eelgrass presence in PMB and to investigate this timeline to see if there is a relationship between eelgrass presence and finfish aquaculture farm activity. Community members knowledgeable of eelgrass existence in the bay were asked to indicate on maps, where and when they have observed eelgrass in the Bay over the time period they have lived/worked in PMB. Any changes to the indicated beds over time and their current states were recorded as well as any natural or anthropogenic events that may be associated with changes. The eelgrass bed areas indicated on maps were inputted into ArcMap to compile a map that visually presents the geographical areal extents of eelgrass beds in PMB over time since the 1930s. The overall map indicated eight general areas of eelgrass presence other than the current FPMB monitoring sites. Possible changes to eelgrass beds not only include fish farm operation but changes to bridge infrastructure and more frequent severe weather events. Furthermore, the use of LEK as a tool in community-based conservation research and its limitations were evaluated.

The maps showing historical areas of eelgrass presence and the changes over time before and after finfish aquaculture operation can contribute to local community conservation initiatives of FPMB, especially their community consultation effort with aquaculture companies and the provincial government to change fish farm regulations and management in Nova Scotia. Furthermore, this study uses the LEK of local peoples to fill in knowledge gaps in biological science monitoring to aid future studies of environmental impacts of finfish aquaculture.

Oral Presentations

Communication Between/Among Stakeholders & Policy Makers

Out of the same waters: Contemporary relations between Mi'kmaq and Settler fishers

Caitlin Krause, Department of Sociology and Social Anthropology, Dalhousie University, caitlin.s.krause@gmail.com

Following the Supreme Court of Canada *Marshall* decision (1999), the Department of Fisheries and Oceans (DFO) was left to deal with the ambiguities of the ruling. In order to resolve tension and conflict between Mi'kmaq and Settler fishers in the immediate aftermath of the decision, the DFO developed Marshall Agreements with individual Mi'kmaq communities in the region. In signing these Marshall Agreements, Mi'kmaq communities would agree to fish by industry regulations and standards in return for the government purchase and allocation of fishing licences and gear.

This research revealed that although relationships between fishers in the context of work are good, and have improved since the decision, Settler fishers still feel resentment toward Mi'kmaq fishers because of what they interpret as preferential treatment of Mi'kmaq fishers by the government. Because Settler and Mi'kmaq fishers are not interacting on a private level in other areas of social life, misconceptions still exist as to why Mi'kmaq fishers received government support in their massive re-entry to the commercial fishery following the *Marshall* decision. The research proposes that individuals assist in creating safe spaces where the building of private relations between Mi'kmaq and Settler fishers can be encouraged. The creation of these safe spaces could create an environment where misconceptions could be cleared and greater harmony could be established.

This research addresses an example of policy integration when there was little open communication about the implications of the policy on communities of fishers in the region. Because it was necessary for the DFO to integrate Mi'kmaq fishers into the fishery quickly and as amicably as possible, many Settler fishers remained in the dark in terms of the development of Marshall Agreements. Learning from this example could contribute to more effective management of policy integration in the future through better dissemination of information and on-going communication and consultation with fishers in the region.

Oral Presentations

Marine Governance, Policy & Law

Alternative dispute resolution: Can it advance the stated policies of integrated coastal zone management in Canadian fisheries and oceans?

David Foster, Department of Biology, and College of Sustainability,
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The *Jobs and Growth Act 2012 (Bill C-45)* was tabled in March, 2012, and received Royal Assent in December, 2012. It makes changes in many existing Canadian laws, including the *Navigable Waters Protection Act* (NWPA), with an emphasis on economic prosperity via the creation of infrastructure. Concurrently, the new Act deemphasizes environmental protection. The purpose of this study is to evaluate how changes to this Act will affect the level of environmental protection for Canadian waterways that provide critical ecosystem goods and services for all Canadians. The study poses the question: have changes to the NWPA endangered long term environmental sustainability, especially in aquatic ecosystems?

A Strategic Environmental Assessment (SEA) was conducted to investigate the strengths and weaknesses of the new legislation based upon a literature review and interviews with experts and stakeholders. SEA is an evidence-based tool for analyzing the environmental impacts and sustainability of policy changes, and can be used proactively to evaluate the importance of environmental issues in proposed and new legislation. The reduction of regulatory requirements for smaller works suggests future infrastructure approvals will be much faster with less analysis of environmental issues. In addition, the new Act applies only to a restricted number of bodies of water. The onus of protecting the navigability and environmental health of the remaining, non-regulated environments will fall to private citizens who have the right to litigate at their own expense and only after environmental damage has occurred.

Results from the literature review and interviews documented that environmental protection will be weakened. Those stakeholders whose interest lies in environmental protection oppose the legislative changes, while those involved in industry are generally positive about the less rigorous and faster approval process. The SEA found that some of the changes entailed within C-45 were reasonable, but others have created a deficiency in environmental protection that needs to be corrected legislatively. A third policy option was proposed, which attempted to balance environmental protection with social progress and economic development. The study demonstrated that SEA represents a valuable tool in the development of policy and legislation by taking into account environmental protection and sustainability. SEA should be utilized more frequently at all levels of government planning.

Oral Presentations

Addressing Uncertainty in the Marine Environment

The environmental risks of shipping in Canada's Arctic

Leah Beveridge, Marine Affairs Program Alumna, Dalhousie University,
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The global climate is warming and, as a result, the environment is changing. One of the most well-reported changes is the decline in sea ice, in duration, extent, and thickness. Among many other consequences, this has reignited the interest in the Northwest Passage for marine-based transportation; from trans-Arctic shipping between the Pacific and the Atlantic, to expanding fisheries and tourism operations, to enhanced community resupply and new economic developments. The Canadian Arctic is a fragile environment though, on which the Inuit depend for nutritional and cultural purposes. Therefore, it is important that the full breadth of environmental risks are considered, and the ways in which these translate to potential impacts on Inuit are included. There are potential benefits to be reaped as well as marine transportation increases in the North, and therefore the development of shipping must be managed in a way that maximizes the positive outcomes and minimizes the negatives, to which marine spatial planning is suggested. This paper documents the environmental risks and how (based on the literature) the realization of each would impact the Inuit, and it proposes marine spatial planning as a means of addressing the environmental, economic, social and cultural concerns of shipping development in the Canadian Arctic.

Oral Presentations

Addressing Uncertainty in the Marine Environment

Seasonal migration of the American lobster through the FORCE tidal turbine test site, Minas Passage, Bay of Fundy

Kaycee Morrison, Department of Biology, Dalhousie University,
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The American lobster (*Homarus americanus*) commercial fishery is Canada's most valuable seafood export, with significant catch sourced from the upper Bay of Fundy. Local lobster fishers report that lobsters undergo seasonal migration (through Minas Passage into Minas Basin in spring to shoal; outwards from the basin in late fall to avoid cold water temperatures), but little is known regarding the temporal or spatial scale of movement. The Fundy Ocean Research Centre for Energy (FORCE) in-stream tidal turbine test area, located in Minas Passage, is believed to be a portion of the seasonal lobster migration corridor. This project examines movement patterns of electronically tagged lobsters, including habitat analyses, with the goal of collecting baseline data before and after control impact (BACI) studies in order to provide information for policy and decision-making. Vemco acoustic transmitters were fitted to 125 adult lobsters, sourced from commercial catch in Minas Basin - lobster fishing area (LFA) 35. Bottom-mounted Vemco receivers were deployed in arrays within Minas Passage to detect migration of tagged lobsters through/near the FORCE site. Seafloor video clips, photographs, and grab samples collected aboard the CCGS Hudson in June 2013 were examined quantitatively and qualitatively for macrobiota and substrate composition. In total, 130,217 detections from 38 (30%) lobsters were logged in Minas Passage, at 30 receiver stations, with 71% from the northern third of Minas Passage. Ten lobsters were detected at or near (within 200 m) the FORCE test area. Some outward migration through the passage occurred in late fall in both years. Receivers moored throughout winter months in 2012/2013 indicate lobster presence (including berried females) in the passage as late as February. Undetected lobsters may indicate overwintering of lobsters in Minas Basin and/or dislodged transmitters. Understanding degree of seasonal exchange of lobsters between the Minas Basin and Passage allows for predictions of potential risk posed to this valuable ecosystem component by in-stream tidal energy developments to be made. Findings from this study may contribute to future policy decisions regarding fishing exclusion zones, fisheries management, and anti-biofouling techniques.

Oral Presentations

Addressing Uncertainty in the Marine Environment

Passive acoustic monitoring of cetaceans at intertidal weirs in Minas Basin, Nova Scotia

Monica Reed, Earth and Environmental Science, Acadia University,
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Tidal energy development sites, including the Fundy Ocean Research Centre for Energy (FORCE) in Minas Passage in the Bay of Fundy, present potential risks to marine mammals. Passive acoustic monitoring (PAM) systems provide a means to acoustically detect cetacean presence and activity, allowing for uncertainties related to the effects of tidal energy development on marine mammals to be addressed. We used passive acoustic hydrophones to examine the click-trains of the Atlantic harbour porpoise (*Phocoena phocoena*), the most abundant cetacean species in the Minas Basin and Minas Passage. This project is part of a larger study examining the usefulness of intertidal weirs as monitoring platforms, and aims to better inform FORCE about fish and marine mammal movements in the region. The project involved cetacean monitoring from the intertidal zone near the FORCE test area, and at two intertidal weirs with the aid of two PAM technologies, the Porpoise Detector (C-POD; Chelonia Ltd.) and the icListenHF hydrophone (icListenHF; Ocean Sonics Ltd.). Seasonal abundances of commercial and non-commercial fishes were determined by their capture in weirs at low tide. Harbour porpoise were detected by both PAM technologies near to the Bramber weir site, but were rarely within the listening range (100-200 m) of the C-PODs located at the Five Islands weir site. Peaks in porpoise presence near the Bramber weir occurred during the spring and fall. Detections were uncommon during mid-June to August, mirroring known seasonal trends in Minas Passage, and suggesting that porpoise are located in cooler waters west of Minas Passage during the warm summer months. There was no clear relationship between porpoise presence and weir fish catch abundance; however, diel, tidal and lunar patterns were evident in the number of porpoise click-trains detected. The icListenHF outperformed the C-PODs, detecting on average 20x more click-trains with concurrent sampling. It is recommended that future monitoring of porpoise in the region's near shore environment include the icListenHF or a similar long range (>500 m) hydrophone, with monitoring in early spring through to late fall. This research informs the design of future marine mammal monitoring studies, which are required to address uncertainties associated with the impacts of tidal energy development on the region's marine mammals.

Poster Presentations

Sustainability and Knowledge Systems

A guide for integrating *Inuit Qaujimajatuqangit* into decision-making for marine shipping development in Nunavut

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Shipping development in the Arctic region is becoming a topic of local, national, and international interest and is closely linked to other issues in the Arctic, such as climate change and natural resource exploitation. Shipping development is moving forward while the Inuit people of Nunavut, Canada remain closely connected to the land and sea, relying on the land and sea for culturally relevant subsistence hunting and fishing activities. *Inuit Qaujimajatuqangit* (IQ) is an Inuktitut term that broadly means Inuit traditional knowledge and encompasses all that Inuit know. IQ and its principles represent tools that can and should be used in the management of marine resources and activities. The Nunavut Land Claims Agreement (NLCA) provides the requirement for Inuit input on management decisions that may affect their ways of life. However, shipping development in Nunavut is seemingly advancing without much consideration for the Inuit people and their use of the marine environment. There is a need for improved management of marine shipping in Nunavut in order to consider the direct and indirect effects of shipping on the environment and people at the local level. Considering the effects of shipping does not mean halting shipping development, but rather ensuring that shipping development moves forward in an environmentally sustainable and socially responsible way. It is recommended that marine managers responsible for shipping in Nunavut's waters gain an understanding of IQ and utilize improved methods for incorporating IQ into the decision-making process.

Poster Number 1

Poster Presentations

Marine Governance, Policy & Law

The tragedy of the independent: Public policy and traditional recruitment in Nova Scotia's small boat fishery

Jessica MacIntosh, Marine Affairs Alumna, Dalhousie University,
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The industrialization and modernization of the fishery in Atlantic Canada has had a destructive effect on small boat dependent fisheries communities. The neoliberal policies and processes of the current political economy support corporate, wealth accumulation fishing and make it extremely difficult for small boat marine harvesters to participate in the fishery. This disrupts important local level social and economic processes that underwrite family and community in coastal settings. In particular, traditional patterns of recruitment based on networks of kith and kin relations are challenged by restrictive management policies. These traditional processes mobilize the continuation of local knowledge, fishing skills, and the family unit over generations, and as such are a key source of human and social capital, and thus sustainability, in small boat dependent fisheries communities. However, restrictive entry and allocation policies such as limited entry licensing and individual quota management make it increasingly difficult for youth to choose fishing as a livelihood.

This research assembles fundamental data regarding small boat dependent fisheries communities and how they have changed in response to the political economy over time. It also incorporates survey data from a sample of small boat marine harvesters that illustrates family and life histories in coastal communities in Nova Scotia. The Sustainable Livelihoods Approach (SLA) is used to illustrate the value of the social and human capital present in social networks in fisheries communities, and argue that these more qualitative types of capital assets are necessary for achieving sustainable livelihoods, fisheries and communities.

This research can contribute to sustainable oceans management by illustrating the correlation between fisheries management policies and fishing communities. It emphasizes that fisheries policies that recognize distinct social and familial processes in the fishing community are more appropriate, as they allow for the continued development of healthy communities and thus healthy fisheries. Furthermore, it illustrates that local knowledge is passed down generations through familial and community relations; as such, policies that support these processes would effectively address the local knowledge/policy interface.

Poster Number 2

Poster Presentations

Communication Between/Among Stakeholders and Policy Makers

Uncovering the real versus perceived issues within the Canadian Atlantic seal fishery

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The most commonly hunted species of seal in Canada is the harp seal (*Pagophilus groenlandicus*). There is a lot of information on the Canadian seal hunt available, from many diverse and disparate sources. Often advocacy groups have the loudest voice, and a negative international perception regarding the seal hunt complicates Canada's position for the management of this resource. The objectives of this study were to analyze the current status of the seal hunt from multiple perspectives and share the results in an unbiased fashion. A literature review was conducted in specific key areas. These included a review of the media, review of the management plan from the Department of Fisheries and Oceans Canada (DFO), literature on sealing ethics, international perspectives and sealing history in Canada.

Harp seals are not protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the North Atlantic Marine Mammal Commission (NAMMCO) has determined that the seal hunt is humane. Despite this, the European Union (EU) placed a total ban on seal products in 2008, both within and between EU countries. Canada views this ban as a violation of the EU's obligations to the World Trade Organization (WTO). As such, there is an ongoing legal battle between Canada, the EU and the WTO, that remains unresolved to date.

A review of the 2011-2015 Integrated Fisheries Management Plan for Atlantic Seals showed that the DFO runs a highly controlled and thoroughly managed hunt. Some studies have shown that the DFO's animal welfare standards practiced in the hunt are at least comparable, if not exceeding the current slaughterhouse standards. However, the economic viability of the industry remains unclear. Some of the socioeconomic benefits of the hunt are not directly obvious, and not all of the managing costs are made apparent by DFO. Regardless of these facts, the media has impacted the public's perception of this issue, resulting in difficulty understanding the opposite side of the matter. In order to clear up misconceptions regarding the Canadian seal hunt, several recommendations are made, including: increasing public awareness and education; implementing educational materials on the DFO website; further research into the sustainability and effectiveness of current DFO management practices; granting the EU observer status in the Arctic Council; and better monitoring by the DFO. Furthermore, it is important that unbiased and factual campaigns be created to properly educate the public on the issue.

Poster Number 3

Poster Presentations

Communication Between/Among Stakeholders and Policy Makers

Communicating the ocean: Engaging public interest and action around ocean issues

Bloudoff, N., School of Information Management; **Cottreau, C.**, School of Public Administration; **Davis, M.**, School for Resource and Environmental Studies; **Dougherty, M.**, Rowe School of Business; **Gillis, L.**, School of Public Administration; and **Vigna, A.**, School for Resource and Environmental Studies; Dalhousie University.

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As identified by the International Ocean Institute Canada (IOI), communicating ocean issues to the public is a difficult task. These issues are environmentally complex and not all of the problems are immediate enough for the public to become and remain engaged. Therefore, IOI-Canada has tasked a group of graduate students in the Faculty of Management to conduct course-based research to determine the best methods for IOI-Canada to communicate ocean issues to the Canadian public. A literature review, an online survey resulting in 451 responses, and 4 expert interviews were conducted. While a heavy fraction of survey respondents were from Nova Scotia (a coastal province), key findings indicated that emotional/shocking ocean photographs drew the most interest from Canadians, while economically themed news stories that offered hope and optimism proved to be most engaging. The most popular communication channels were conversation and online media. Going forward, key recommendations for IOI-Canada are to: 1) Tailor its communication efforts to specific audiences; 2) Re-evaluate the organization's online presence; 3) Expand outreach beyond Nova Scotia to the rest of Canada; and 4) Focus on providing education to the public about ocean issues so their knowledge pertaining to the ocean will help them practice sustainable lifestyles. Overall, the theme of public engagement surrounding ocean issues is largely under researched. Awareness is imperative for the future of the ocean, and as one survey respondent declared: "The ocean is a huge and undervalued part of our life on earth, and we are all connected to it."

Poster Number 4

Poster Presentations

Communication Between/Among Stakeholders and Policy Makers

Strengthening ocean education in Nova Scotia high schools: Building our future ocean champions

Karen Devitt, School for Resources and Environmental Studies; **Melissa Archibald**, School of Public Administration; **Alison Froese-Stoddard**, School of Information Management; **Christine Stortini**, School for Resources and Environmental Studies; **Amanda Iadipalo**, School for Public Administration; and **Christina Goudy**, Rowe School of Business; Dalhousie University

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Communicating ocean knowledge is essential in order to understand and address the threats facing the oceans and move towards more sustainable development. Studies suggest that there is a gap between scientific results, interpretation, implementation, and the relevance of scientific results to the general public. There is also literature noting that this gap could be addressed by starting ocean awareness at a young age. As such, this paper presents the findings of a project that explored the status of ocean knowledge in the Nova Scotia public school system. This study focused primarily on “Oceans 11”, the only course offered in Nova Scotia that specifically focuses on ocean issues. An extensive literature review, curriculum analysis, and interviews with key stakeholders indicate that the development of a professional development (PD) workshop for teachers specifically focusing on ocean issues could be an effective way of addressing gaps in translating ocean knowledge within the school systems and to the general public. Key recommendations highlight the need for: (a) the PD workshop to focus both on curriculum content, but also on the presentation of this information in an exciting and engaging manner. Such approaches could include using social media and engagement with community projects, and (b) integrative activities and updated resources that teachers can incorporate into their classrooms. The study was conducted in 2013 by Dalhousie graduate students for the International Oceans Institute, Canada, as a requirement for the Management without Borders, an inter-professional graduate course.

Poster Number 5

Poster Presentations

Addressing Uncertainty in the Marine Environment

Emergency management response after coastal disasters: The role of ICZM in mitigating the impacts of large-scale events

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In the wake of major coastal disasters, and with more than half the world's population living along the coast international awareness and concerns about preventing or reducing the impacts of these events has grown considerably. For example, one of the global efforts to address these problems is the United Nations (UN) ten year Hyogo Framework for Action, 2005-2015 (HFA). The HFA is the first plan to explain, describe and detail the work that is required from all different sectors and actors to reduce disaster losses. Integrated Coastal Zone Management (ICZM) is one approach that has the potential to operationalize high level policies such as the HFA at the local level.

Three case studies (the Indian Ocean Tsunami, 2004; Hurricane Katrina, 2005, and the Haiti Earthquake, 2010) are analyzed through the ICZM framework for good management practices (i.e. initiation, planning, implementation, and monitoring/evaluation). The case studies were selected based on the following criteria: (i) a high profile event that was considered a natural disaster, (ii) be of a coastal nature, and (iii) represent the same level of organization at either a national or local level to be able to be compared. The objective of this analysis was to firstly assess if an ICZM strategy was in place, and at what stage of implementation. The second objective was to explore whether having an ICZM strategy and/or plan in place could have helped mitigate the impacts from the disaster.

Findings from this paper suggest that from a capacity building perspective, ICZM is a useful approach for mitigating disaster impacts. The successful implementation of the ICZM framework can potentially create open communication pathways between different levels of policy makers, across sectors and at the local level. As such, these relationships may increase the social-ecological resilience of a specific area. For example, based on these case studies, if strong ICZM practices had been in place communities may have been in a better position to mitigate and/or recover faster after a specific event. As such, given the predicted threats from global warming and climate change, implementing robust ICZM plans could be very beneficial for both developed countries such as the United States and developing nations in Asia and the Caribbean.

Poster Number 6

Poster Presentations

Addressing Uncertainty in the Marine Environment

Microplastic fibers in the intertidal ecosystem surrounding Halifax Harbor, Nova Scotia

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Humans continue to increase the use and disposal of plastics by producing over 240 million tonnes per year, polluting the oceans with persistent waste. The majority of plastic in the oceans are microplastics (<5 mm). The purpose of this study was to quantify microplastics in the intertidal ecosystem adjacent to Halifax Harbour, and determine if any trends in microplastic abundance were detectable from the samples. The contamination of microplastic fibers was quantified in sediments from the intertidal zones of one exposed beach and two protected beaches along Nova Scotia's Eastern Shore. From the two protected beaches, polychaete worm fecal casts and live blue mussels (*Mytilus edulis*) were analyzed for microplastic content. Store-bought mussels from an aquaculture site were also analyzed. All sediment samples were contaminated with microplastic fibers, with higher concentrations at the high tide line from the exposed beach and at the low tide line from the protected beaches. Microplastic concentrations from polychaete fecal casts resembled concentrations quantified from low tide sediments. In two separate mussel analyses, significantly more microplastics were enumerated in farmed mussels compared to wild ones. This study provides further insight into the extent of microplastic contamination to the marine environment and food web. This information can be used to better manage the contamination microplastics in seafood, and as preliminary data for future microplastic studies.

Poster Number 7

The Sobey Fund for Oceans

Made possible by a generous and innovative gift by Donald R. Sobey, a unique partnership has been formed by the Marine Affairs Program (MAP) at Dalhousie University, “Canada’s Ocean University,” in Halifax, Nova Scotia, and WWF-Canada, a leader in marine conservation.

The goal of the Sobey Fund for Oceans is to inspire innovative multi-disciplinary approaches for creating healthy oceans and sustainable economies. The Sobey Fund for Oceans provides resources to support scholarships and work placements to help tomorrow’s leaders see “beneath the surface” of our oceans’ problems to find lasting solutions.

Sobey Fund for Oceans Scholarship Recipients 2014-2015



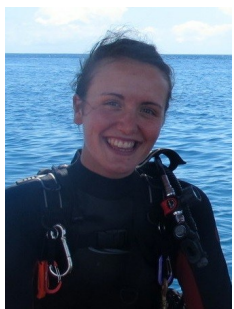
Manuel Dureuil

My aim is to better understand the spatial ecology of North Atlantic shark populations in order to provide a scientific basis for top predator restoration programs and to aid the development of comprehensive protection measures. I very much believe that my research will strongly benefit from the excellent infrastructure and expertise offered at Dalhousie and I am deeply grateful that the Sobey Fund for Oceans is supporting this project.



Julie Hovey

I am thrilled to be given the opportunity to pursue my interest in marine environments. During my time with the Marine Affairs Program I hope to gain the skills and knowledge needed to make a positive contribution to the sustainable use of marine resources. I am particularly interested in improving the current methods of aquaculture and reducing its associated environmental impact through the integration of ecological, sociological, and economic knowledge.



Maryann Watson

I believe that sustainable solutions for coastal management will come from understanding the impact of decisions on all of the communities involved. The Sobey fund for Oceans provides me with a unique opportunity to learn to use an interdisciplinary approach to achieve both environmental and social goals.

Sobey Fund for Oceans Committee 2013-2014

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To be the foremost provider of interdisciplinary education for marine management professionals, thereby advancing sustainable ocean uses and healthy marine environments.

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***Our sincere thanks to the presenters, participants,
artists, chairs, judges, rapporteurs and volunteers
who have contributed their time and talent to
make this a memorable event.***

We are very grateful to all of our sponsors and supporters: the Sobey Fund for Oceans, NEXUS Coastal Resource Management, Faculty of Science Alumni Association, MBA Cooperate Residency Program, Dalhousie Bookstore, Sobey Fund for Oceans Steering Committee and Marine Affairs Student Society

We would like to thank and recognize those who made our opening program so special and without whose presence our conference would have been much diminished. Special thanks are due Martha Stiegman and Kerry Prosper for sharing their film *Seeking Netukulimk* and time with us. A very special thank you to our panelists Sherry Pictou, Dr. Fred Metallic and Kerry Prosper, as well as our moderator Dr. Claudio Aporta. We thank Shelley Young for opening our conference with the Mi'kmaq honour song. A big thank you to Dr. Chris Moore, Dean, Faculty of Science for formally opening the conference. We thank Dr. Robert Fournier, Interim Director of the Marine Affairs Program for his opening remarks and for Co-Chairing the Sobey Fund for Oceans Steering Committee with Dr. Robert Rangeley. We sincerely thank Mr. Robert Sobey for generously providing educational opportunities for future ocean leaders.

Special thanks to our judges Dr. Robert Fournier, Dr. Stephanie Boudreau, Jenny Baechler, Alanna Gauthier, Tamara Wilson, and Stacie Sybersma. Thank you to Susan MacLeod, Shelly Young and Marina Young for their contributions to the interactive sessions. We would also like to acknowledge Chris Milley, MAP Alumni, and the many others who have generously given up their time to support our conference and students.

A very special thank you is due to Becky Field for her guidance and support in helping us plan for this conference. Others without whom our efforts would not have been possible include Matthew Kennedy, Heather Frausell, Colin Craig, Katheryn Minty, Sarah Schwarz, David Barkhouse (Dalhousie University Bookstore), Campus Copy (Dalhousie Student Union). We would also like to acknowledge the staff and faculty of the Marine Affairs Program.

Our sincere thanks to the presenters, participants, artists, chairs, judges, rapporteurs and volunteers who have contributed their time and talent to make this a memorable event.

To all our student volunteers who deserve special recognition for making this conference a reality: *Logistics Sub-Committee* - Sarah Chamberlain (Chair), Cameron Christensen, Stacie Sybersma, and Randel Thompson. *Promotion Sub-Committee* - Chloe Ready (Chair), Shelby McLean, Alana Vineberg, and Sonia Jind. *Content Sub-Committee* - Danielle Scriven (Chair), Amber Giles, Sarah Chamberlain, Elise Will, Nicolas Winkler, Sonia Jind, and Ainsley Allen.

In particular, we would like to acknowledge Cameron Christensen for his extraordinary work on securing the venues, Randel Thompson for organizing the outreach table at the Halifax Seaport Market, Alana Vineberg for the special edition conference swag, and Chloe Ready for her work on the wiki and conference promotion. We thank Elise Will and Liz Wilson for their work on the abstract booklet, as well as the Abstract Submissions Ad Hoc Committee chaired by Sonia Jind. Thank you to everyone who spent time putting up posters and helping out at promotional events. We are very grateful to Amber Giles for her efforts in bringing together the film directors and panel members who have been generous enough to share their time and knowledge with us.

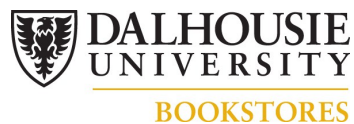
A sincere thank you also goes to Liz Wilson – a fantastic conference coordinator whose patience and guidance have been a key element in making this possible. This conference reflects the dedicated teamwork demonstrated by the fulltime and part time students of the Marine Affairs Program 2013-2014 year, under the organization and leadership of the conference chair Nicolas Winkler.



Thank You to our Sponsors!



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