

Coastal Zone Canada and Youth Forum 2010

University of Prince Edward Island
Charlottetown, Prince Edward Island, Canada

Youth Forum

Youth on the Coast
July 23 to 25, 2010

Conference

Healthy Oceans – Strong Coastal Communities
Voices for Change
July 25 to 29, 2010



*Prince
Edward
Island*
CANADA

Fisheries, Aquaculture
and Rural Development

Hosted by the
Prince Edward Island
Department of Fisheries, Aquaculture and Rural Development
on behalf of the Coastal Zone Canada Association



CZC 2010 Conference Data Stick Guide

Welcome to the Coastal Zone Canada 2010 Conference Program data stick guide. This comprehensive document has been designed to provide delegates with a user friendly means of navigating through the conference program and presenter abstracts. The document stimulates smooth flow, effortless access and above all, access to prior presenter information to employ when selecting sections of interest in the conference program. Listed below are a few key instructions that will allow the user the ability to achieve maximum accessibility:

- To access the guide, adobe acrobat or adobe reader will be required. Adobe reader is a free product that can be easily downloaded
- Delegates can simple browse through the conference program, click on a desired presentation title and have that presenters abstract surface
- Return to your prior place in the conference program by simply clicking on the title of the abstract
- In the content of the abstracts, * denotes the presenter of the abstract
- Abstracts that were not received for inclusion into this document, will be accessible via the conference website and at the Social Media Help Desk
- If there is a problem accessing the guide or a requirement for extra assistance, please approach the social media workstation for support

For up to date and ongoing information regarding the conference, please visit the Coastal Zone Canada 2010 Conference website and the Social Media Help Desk.

Conference Program
COASTAL ZONE CANADA 2010
 25-29 July 2010, University of Prince Edward Island
 Charlottetown, Prince Edward Island
Healthy Oceans – Strong Coastal Communities
VOICES FOR CHANGE

For final details, including the presentation schedule and room assignments, please consult the print version of the Conference program and amendments issued during the Conference.

SUNDAY, 25 JULY 2010	
09:00 - 21:00	McDougall Hall, Schurman Market Square REGISTRATION AND INFORMATION DESK
10:00 - 17:00	FIELD TRIP: GREENWICH TO BRACKLEY, PRINCE EDWARD ISLAND <i>Organizers: Gavin Manson, Geological Survey of Canada, Natural Resources Canada; Robin Davidson-Arnott, University of Guelph; and Donald Forbes, Geological Survey of Canada, Natural Resources Canada</i> Participants in this 7 hour excursion will gain insight into past, present and future shoreline processes affecting the central North Shore of Prince Edward Island. Beginning with a short hike and a picnic lunch at a research site in the scenic Greenwich dunes, the trip will proceed west to Brackley Beach, making stops at sites in and outside of the PEI National Park. These sites are helpful in explaining the coastal geomorphology and the erosional and depositional processes that have shaped this iconic section of shoreline.
18:00 - 21:00	McDougall Hall, Schurman Market Square OPENING RECEPTION - <i>Finger food, refreshments and cash bar</i> Welcoming Remarks: • Coastal Zone Canada Association: Grant Gardner, President • University of Prince Edward Island: Wade MacLauchlan, President • Province of Prince Edward Island: Hon. Richard Brown, Minister of Environment, Energy and Forestry • Canadian Coastal Science and Engineering Association: Michael Davies, President

MONDAY, 26 JULY 2010 - MORNING	
08:00 - 17:00	McDougall Hall, Schurman Market Square REGISTRATION AND INFORMATION DESK
08:30 - 12:00	Duffy 123 OPENING PLENARY
08:30 - 09:30	WELCOMING ADDRESSES • Introductions and Overview of the Coastal Zone Canada Calls to Action: Grant Gardner, President, Coastal Zone Canada Association • Message from the Government of Canada: Senator Michael Duffy, Prince Edward Island member of the Senate of Canada • Message from the Province of Prince Edward Island: Hon. Neil LeClair, Minister of Fisheries, Aquaculture and Rural Development • Message from First Nations: Chief Brian Francis, Abegweit First Nation
09:30 - 10:00	YOUTH ON THE COAST 2010 A culturally diverse group of young people, aged 16 to 26, participated in the Youth Forum held on July 23-25 in conjunction with CZC 2010. They learned about coastal issues, shared skills and perspectives, and created a series of video messages and their Call to action for the CZC 2010 Conference. A Discussion Café on the Youth's Call to Action will take place from 15:30-17:00 this afternoon. <i>Moderator: Irene Novaczek, Institute of Island Studies, University of Prince Edward Island</i>
10:00 - 10:30	NUTRITION BREAK: McDougall Hall, Schurman Market Square
10:30 - 12:00	KEYNOTE ADDRESSES THE CRISIS FACING THE WORLD'S COASTS AND OCEANS and THE STATE OF CANADA'S COASTS AND OCEANS Alanna Mitchell and David MacDonald Despite our growing and increasingly integrated approaches to coastal and ocean management, most of the world's coastal zones continue to decline in environmental quality. These keynote addresses will provide a global and the Canadian perspective on the challenges we face in our coastal zones and what needs to be done in the immediate years ahead. <i>Alanna Mitchell is a journalist and author who writes about science. She is the author of the book "Sea Sick: The Global Ocean in Crisis" (2009). Ms. Mitchell was awarded the 2010 US Grantham Prize for excellence in environmental journalism.</i> <i>The Hon. David MacDonald is a former Member of the Parliament of Canada and Ambassador to Ethiopia. He was the first chair of the House of Commons Environment Committee and he participated in the Earth Summit in Rio de Janeiro in 1992. He is organizing the first Parliamentary Forum on the health and future of the oceans, to be held in Ottawa this fall.</i> <i>Moderator: Larry Hildebrand, Environment Canada and Coastal Zone Canada Association</i>
12:00 - 13:30	LUNCH: WA Murphy Student Centre, MacMillan Hall

MONDAY, 26 JULY 2010 - AFTERNOON

13:30 - 15:00	Duffy 135 PLENARY PANEL AND DISCUSSION GOVERNING VOICES - THE CHALLENGES AND OPPORTUNITIES OF COASTAL MANAGEMENT IN CANADA Federal Perspective: Faith Scattolon, Regional Director-General, Fisheries and Oceans Canada, Maritimes Region First Nations Perspective: Russ Jones, Project Manager, Marine Planning, Haida Nation Provincial / Territorial Perspective: Justin Huston, Coastal Zone Advisor, Nova Scotia Department of Fisheries and Aquaculture Municipal Perspective: John Charles, Planner, Halifax Regional Municipality Canada has made substantial, although still insufficient, progress in its efforts to bring more integrated and collaborative approaches to coastal governance. The panellists, representing the governance spectrum in Canada, will present their views on both the challenges and the opportunities as we move towards a fully integrated and well managed coastal environment in Canada. Moderator: Ratana Chuenpagdee, Memorial University and International Ocean Institute-Canada						
15:00 - 15:30	NUTRITION BREAK: McDougall Hall, Schurman Market Square						
15:30 - 17:00	PAPER SESSIONS				DISCUSSION CAFÉ	PANEL	WORKSHOP
	Room: McDougall 328 Session theme: ECOSYSTEM HEALTH Chair: Tim Webster, Applied Geomatics Research Group	Room: McDougall 329 Session theme: COASTAL AND OCEAN GOVERNANCE Chair: Elizabeth De Santo, Dalhousie University	Room: McDougall 242 Session theme: MARINE RESOURCE MANAGEMENT Chair: Delly Keen, Fisheries and Oceans Canada	Room: Kelley 211 Session theme: INTEGRATED COASTAL AND OCEAN MANAGEMENT LAW AND POLICY Chair: Sue Nichols, University of New Brunswick	Room: Schurman Market Square Topic: YOUTH ON THE COAST Leads: Kaley MacDonald and Scott Bradley The Discussion Café will follow up on the discussions at the Youth Forum held on July 23-25 in conjunction with CZC 2010.	Room: Duffy 135 Topic: PARTICIPATORY ACTION RESEARCH: ALLOWING COASTAL COMMUNITIES, POLICY-MAKERS AND RESEARCHERS TO JOINTLY EXPLORE STRATEGIES TO ADAPT TO CLIMATE CHANGE Moderator: Guy Jobbins, International Development Research Centre	Room: McDougall 243 Topic: TIME FOR A PROVINCIAL / TERRITORIAL VOICE? DOES CANADA NEED THE EQUIVALENT OF THE US COASTAL STATES ORGANIZATION? Convenor: Larry Hildebrand, Coastal Zone Canada Association US Coastal States Organization voice, Kristen Fletcher, Executive Director US Federal voice, Gary Magnuson,
15:35 - 15:55	Eutrophication of Prince Edward Island inlets, Gary Bugden, Fisheries and Oceans Canada	Towards a coastal area definition for Nova Scotia, Chris Burbidge, Dalhousie University	Small-scale fisheries: connecting human rights, fishing rights and food sovereignty, Tony Charles, St. Mary's University	Canada and St. Pierre and Miquelon transboundary relations: battles and bridges, Phillip Saunders and David VanderZwaag, Dalhousie University			

15:55 - 16:15	Macro-tidal salt marsh ecosystem response to culvert expansion , Tony Bowron, CB Wetlands & Environmental Specialists	Finding common ground on a term to facilitate improved management in a large diverse area of the earth's surface: the coastalshed , Paul Boudreau, ACZISC Secretariat	Tourism and fisheries: conflict and complementarity in Canada and the Caribbean , Patrick McConney, University of West Indies	Ecosystemic legal regime development in the Gulf of Maine: efforts and impediments , John Duff, University of Massachusetts		Due to low adaptive capacity, Africa is the continent most vulnerable to climate change, and rapidly growing and urbanising coastal communities face complex, dynamic and diverse threats to advances in human development. This panel offers perspectives on the climate challenges faced by African coastal communities and the opportunities for generating solutions through multi-stakeholder action research.	National Oceanic and Atmospheric Administration (NOAA) • US State voice, John Watkins, Ohio Office of Coastal Management • Provincial voices: David MacEwen, Prince Edward Island Dept of Fisheries and Aquaculture - Justin Huston, Nova Scotia Dept of Fisheries and Aquaculture - Nicole Hynes, Newfoundland and Labrador Dept of Fisheries and Aquaculture <i>Note: Workshop continues until 17:00.</i>
16:15 - 16:35	Airborne LiDAR fluorescence analysis for the quantification of water quality characteristics , Stephanie Rogers, Acadia University	At the table: the role of women in Prince Edward Island fisheries management , Sarah Roach-Lewis, Women for Environmental Sustainability	Canada - Spain collaboration on sustainable mussel aquaculture , Ramón Filgueira, Dalhousie University	An evaluation of coastal management policies in British Columbia , Haley Haggerstone, Surfrider Foundation			
16:35 - 16:55	Water Education, Monitoring and Outreach Program, Prince Edward Island , Samantha Doucette and Tracy Brown, Bedeque Bay Environmental Management Association	Setting a new course for coastal management in Canada , Colleen Mercer Clarke, Dalhousie University	Integrated Coastal Zone Management in Atlantic Canada: the case of Atlantic herring , Rob Stephenson, Fisheries and Oceans Canada and Dan Lane, University of Ottawa	Integrated Coastal and Ocean Management law and policy in the European Union and Canada: comparing approaches and lessons in complex jurisdictions , Aldo Chircop and Ryan O'Leary, Dalhousie University			

						Enda Tiers Monde • Adaptation to sea level rise and climate extreme events: a case study from Morocco, Abdellatif Khattabi, École nationale forestière d'ingénieurs • Participatory assessment of socioeconomic vulnerability to sea level rise: case study Gamasa - Ras El Barr coastal area, Egypt, Mohamed Abdrabo, University of Alexandria • Questions / discussion Note: Panel continues until 17:00.	
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MONDAY, 26 JULY 2010 - EVENING

16:15

FIELD TRIPS

HELD CONCURRENTLY

BASIN HEAD MARINE PROTECTED AREA AND THE SOURIS WATERSHED PROJECT, PRINCE EDWARD ISLAND

Organizers: Delly Keen and Randy Power, Fisheries and Oceans Canada and Fred Cheverie, Souris and Area Branch of the PEI Wildlife Federation

Delegates will take a scenic drive to eastern PEI to visit the Basin Head Marine Protected Area (MPA). The Basin Head ecosystem, designated as an MPA in October 2005, is inhabited by a rich diversity of plants, fish, mammals and birds. Most notable is the unique form of Irish moss (*Chondrus crispus*) which has a life cycle and habitat limited to the Basin Head ecosystem. Delegates will have the opportunity to learn about the MPA and its special strain of Irish moss. Delegates will also learn about a project involving the enhancement of wildlife habitat and water quality in the Souris River, and the Watershed Evaluation of Best Management Practices Project, which is evaluating the watershed scale effects of utilizing spring ploughing versus fall ploughing following the hay crop in a potato-grain-hay rotation system.

COVEHEAD WATERSHED, PRINCE EDWARD ISLAND

Organizer: Sarah Jane Bell, Southeast Environmental Association

The Friends of Covehead-Brackley Bay Watershed Group will lead delegates through four sites to illustrate examples of effective highway erosion reduction measures, natural springs, and other stream improvement measures including brush mats, digger log, rock dams, cleaned springs, hanging culverts, and stream crossings. The trip will conclude with a short presentation of recent watershed activities and an open discussion. Delegates will be taken through the scenic community of Stanhope, adjacent to the Stanhope Golf Course.

TUESDAY, 27 JULY 2010 - MORNING						
08:00 - 19:00	McDougall Hall, Schurman Market Square REGISTRATION AND INFORMATION DESK					
08:30 - 10:00	PLENARY: Duffy 135					
08:30 - 09:00	OBSERVATIONS AND INSIGHTS FROM DAY 1: Social Network Update TODAY'S GOALS AND OBJECTIVES: Grant Gardner, President, Coastal Zone Canada Association					
09:00 - 10:00	PANEL AND DISCUSSION BRIDGING VOICES - LINKING LAND AND OCEAN PLANNING AND MANAGEMENT • Brian Emmett, Vice President, Archipelago Marine Research Ltd • Tim Hennessey, Professor of Marine Affairs, University of Rhode Island • Colleen Mercer Clarke, Landscape Architect and Coastal Ecologist One of the highest priorities identified in all Coastal Zone Canada conferences to date and in the international dialogue on integrated coastal and ocean planning and management is the need to bridge the land-sea divide. Land-sea integration, one of the most fundamental principles of Integrated Coastal and Ocean Management, remains its most resistant challenge. This Panel will review international expectations and national approaches to addressing this issue, and highlight practical steps that must be taken to overcome this divide. <i>Moderator: Peter Ricketts, Carleton University and Coastal Zone Canada Association</i>					
10:00 - 10:30	NUTRITION BREAK: McDougall Hall, Schurman Market Square					
10:30 - 12:00	PAPER SESSIONS				WORKSHOP	PANEL
	Room: McDougall 243 Session theme: COMMUNITIES AND ICOM <i>Chair: Tony Charles, Saint Mary's University</i>	Room: McDougall 328 Session theme: ARCTIC ISSUES <i>Chair: Brad Barr, National Oceanic and Atmospheric Administration (NOAA)</i>	Room: McDougall 242 Session theme: COASTAL AND OCEAN GOVERNANCE <i>Chair: Aldo Chircop, Dalhousie University</i>	Room: McDougall 329 Session theme: RISK ANALYSIS AND DECISION MAKING <i>Chair: Matthew Hardy, Fisheries and Oceans Canada</i>	Room: McDougall 246 Topic: INFORMATION MANAGEMENT FOR INTEGRATED COASTAL AND OCEAN MANAGEMENT <i>Convenor: Paul Boudreau, ACZISC Secretariat</i>	Room: Duffy 135 Topic: TRANS-BOUNDARY ENVIRONMENTAL INDICATORS: MAKING COMPLEX SYSTEMS UNDERSTANDABLE <i>Moderator: Susan Russell-Robinson, US Geological Survey</i>
10:35 - 10:55	Ten years of bridging land and sea: snapshots of a collective and regional approach to sustainability in a coastal zone, Chantal Gagnon, Southern Gulf of St. Lawrence Coalition on Sustainability	Science to policy Marine Protected Area development in Canada's Arctic Ocean environment, Candace Newman, Natural Resources Canada	Our coast: the role of "State of the Coast" reporting in addressing Nova Scotia's priority coastal issues, Sean Weseloh McKeane, Nova Scotia Dept of Fisheries and Aquaculture	A proposed risk-based management approach for managing activities affecting Canada's oceans, Martine Giangioppi, Fisheries and Oceans Canada	The Workshop will highlight progress in, and the continuing challenges of, information management. Presenters will provide overviews of information management, online mapping and the latest in research on assessing the impact of information on management. Following the	Panellists will describe and illustrate different indicator suites used to assess the state of ecosystems, showcase products designed to strengthen decision-making and environmental management, and discuss lessons learned from working with decision-makers
10:55 - 11:15	Community-led Integrated Coastal Zone Management: a case study from Malpeque Bay, Prince Edward Island, Orlando Harvey, Dalhousie University	Satellite remote sensing in the Mackenzie River Delta, Michael Brown, Dalhousie University	Key elements of ocean and coastal governance: values, images and principles, Ratana Chuenpagdee, Memorial University	Airborne LiDAR for coastal zone risk mapping in the Maritime Provinces, Tim Webster, Applied Geomatics Research Group		

11:15 - 11:35	Incorporating the coastal concerns of primary stakeholders in St. Margaret's Bay, Nova Scotia into the planning and management of the coast, Alexi Baccardax, Dalhousie University	Recent shoreline changes in the western Canadian Arctic, Dustin Whalen, Geological Survey of Canada, Natural Resources Canada	The importance of legislative frameworks for Integrated Coastal Zone Management programmes: a case study of the India experience, Tony George Puthucherril, Dalhousie University	A pilot project for the conservation of capelin in the estuary and the Gulf of St. Lawrence using a risk-based approach, Gilles Tremblay, Fisheries and Oceans Canada	opening comments, an open discussion will be promoted amongst all participants in an effort to develop a common view on the current state of information management and the priorities for future improvement. Presenters include:	and other user groups. Additionally, there will be a presentation on blending traditional knowledge and science to help understand and manage environmental resources and protect mother earth. Presenters include:
11:35 - 11:55	TBA	The value of maritime heritage to Arctic conservation, Brad Barr, National Oceanic and Atmospheric Administration	The Arctic Council Working Group for Protection of the Arctic Marine Environment's contributions to coastal and ocean governance, Julie Potter, Fisheries and Oceans Canada	Nova Scotia coastal infrastructure risk assessment, Andrew McGillis, W.F. Baird & Associates Coastal Engineers Ltd	• Paul Boudreau, ACZISC Secretariat • Justin Huston, Nova Scotia Dept of Fisheries and Aquaculture • Mary Lynn McCourt, PEI Dept of Environment, Energy and Forestry • Elaine Toms, Dalhousie University • Bertrum MacDonald, Dalhousie University • Peter Wells, Dalhousie University, International Ocean Institute-Canada and BoFEP <i>Note: Workshop continues until noon.</i>	• Gulf of Maine: Christine Tilburg, Gulf of Maine Council on the Marine Environment; Kathryn Parlee, Environment Canada; and Susan Russell-Robinson, US Geological Survey • Coast Salish Annual Canoe Journey: Sarah Akin and Eric Grossman • Georgia Basin - Puget Sound: Jennie Wang, Environment Canada • Great Lakes: Nancy Stadler-Salt, Environment Canada • Discussion / questions <i>Note: Panel continues until noon. A Discussion Café on this topic will take place from 13:30-15:00 this afternoon.</i>
12:00 - 13:00	LUNCH: WA Murphy Center, MacMillan Hall					

TUESDAY, 27 JULY 2010 - AFTERNOON

13:00 - 13:30	Duffy 135 PLENARY LOCAL VOICES AT THE FRONT LINE – STRENGTHENING COASTAL COMMUNITIES Melanie Wiber, Professor, Department of Anthropology, University of New Brunswick and Randall Angus, Director of Integrated Resource Management, Mi'kmaq Confederacy of Prince Edward Island This presentation will highlight on-the-ground experiences and ongoing issues relating to coastal community engagement in ocean and coastal management. The presentation will explore the knowledge, capacity building and policy change needed to increase community inclusion in these processes. <i>Moderator: Kathryn Parlee, Environment Canada</i>						
13:30 - 15:00	PAPER SESSIONS				WORKSHOPS		DISCUSSION CAFÉ
	Room: McDougall 243 Session theme: COASTAL COMMUNITIES AND COASTAL MANAGEMENT <i>Chair: Madelaine Patterson, Coastal Community-University Research Alliance</i>	Room: McDougall 328 Session theme: COASTAL MANAGEMENT STRATEGIES <i>Chair: Wayne Barchard, Environment Canada</i>	Room: McDougall 242 Session theme: AQUACULTURE <i>Chair: Neil MacNair, Prince Edward Island Dept of Fisheries and Aquaculture</i>	Room: McDougall 329 Session theme: SOCIAL, ECONOMIC AND CULTURAL VALUES IN SUPPORT OF ICOM <i>Chair: Ray MacIsaac, Fisheries and Oceans Canada</i> <i>A Discussion Café on this topic will take place this afternoon.</i>	Room: McDougall 246 Topic: LINKING CULTURES TO PROTECT MOTHER EARTH: GOVERNANCE FOR CONSERVATION <i>Convenors: Marianne Janowicz and Hugh Akagi, Bay of Fundy Ecosystem Partnership (BoFEP)</i>	Room: Kelley 211 Topic: THE C-CHANGE INTERNATIONAL COMMUNITY-UNIVERSITY RESEARCH ALLIANCE (ICURA) PROJECT <i>Convenor: Dan Lane, C-Change ICURA</i>	Room: Schurman Market Square Topic: TRANS-BOUNDARY ENVIRONMENTAL INDICATORS: MAKING COMPLEX SYSTEMS UNDERSTANDABLE <i>Lead: Susan Russell-Robinson, USGS</i>
13:35 - 13:55	Building capacity for Integrated Coastal Management: civil society engagement in high schools, Velta Douglas, University of New Brunswick	Coastal management: bridging the land-water divide, Marc Ouellette, Fisheries and Oceans Canada	The growth and challenges of aquaculture in Prince Edward Island, Kim Gill, Prince Edward Island Dept of Fisheries and Aquaculture	Ecosystem-based management and science tools for coastal communities, Jon Grant, Dalhousie University	The Workshop will explore the evolution of the Western concepts of Conservation. It will also explore the foundations of Aboriginal culture (traditional governance structures and oral traditions), seeking ways of reforging the relationship among cultures to protect Mother Earth.		This Discussion Café is a follow-up to the Panel held this morning (Tuesday, 27 July) from 10:30 to noon on this topic. Questions to be discussed include: • What indicators do the three trans-boundary efforts have in common? • Are there combinations of similar
13:55 - 14:15	Institutional gaps in Canadian community-based management: the case of the Fundy Fixed Gear Council, Hubert Saulnier and Carolea White, Fundy Fixed Gear Council	Linking land to ocean in coastal planning: a comparative study of municipalities in Iceland and Norway, Morten Edvardsen, Norwegian University of Life Science	Overview of the oyster enhancement program conducted by the Prince Edward Island Shellfish Association, Frank Hansen, PEI Shellfish Association	Piloting the mapping of socio-cultural values and place attachment on a small island, Irene Novaczek, Institute of Island Studies			

14:15 - 14:35	Alternative dispute resolution: can it advance the stated policies of Integrated Management in Canadian fisheries and oceans?, Courtenay Parlee, Coastal CURA	Thinking outside the sandbox: why management strategies for sandy beaches benefit from a plover's eye view, Sue Abbott, Bird Studies Canada	The development of the salmon aquaculture industry in southwestern New Brunswick, Bay of Fundy, 1978 to the present: changes in selected farm parameters and management policies, Blythe Chang, Fisheries and Oceans Canada	Community governance perspectives support social-ecological systems and resilience, Lisette Wilson, Dalhousie University	Presenters: • Peter Wells, Dalhousie University, International Ocean Institute-Canada and BoFEP • Gkisedtana-moogk, Wampanoag elder • Alma Brooks, Maliseet elder <i>Note: Workshop continues until 15:00.</i>	scenarios, and to prepare Community Adaptation Action Plans to address the anticipated changes. Presenters: • Community adaptation to coastal climate change: Canada and the Caribbean, John Clarke, University of Ottawa • Project research methodology, Dan Lane, University of Ottawa • C-Change partner and community of interest, Don Poole, City of Charlottetown (TBC) • Caribbean community experience and work to date, Patrick Watson and Michael Sutherland, University of West Indies • Discussion / questions <i>Note: Workshop continues until 15:00.</i>	indicators that could be used to make indices? • What capacity building efforts between Canada and the United States, or between the three trans-boundary indicator efforts, would greatly advance data collection or monitoring to deliver best indicators to local and regional decision-makers • What indicator tools need to be developed or improved to greatly increase ease of use and widen the pool of users?
14:35 - 14:55	Learning to share: communication and information flow regarding the south west New Brunswick finfish aquaculture industry, Donna Curtis, University of New Brunswick	Designing integrated coastal zone programs for reducing non-point source pollution, Timothy Hennessey, University of Rhode Island	Sea lettuce (Ulva) in Prince Edward Island, Cynthia Crane, Prince Edward Island Dept of Environment, Energy and Forestry	The Green Shores rating and certification system for coastal developments, Brian Emmett, Archipelago Marine Research			

TUESDAY, 27 JULY 2010 - AFTERNOON

15:00 - 15:30	NUTRITION BREAK: McDougall Hall, Schurman Market Square					
15:30 - 17:00	PAPER SESSIONS			COMMUNITY FORUM	DISCUSSION CAFÉS	FIELD TRIP
	Room: McDougall 243 Session theme: COASTAL ISSUES <i>Chair: Patricia Manuel, Dalhousie University</i>	Room: McDougall 328 Session theme: MARINE PROTECTED AREAS <i>Chair: Laura Park, Fisheries and Oceans Canada</i>	Room: McDougall 242 Session theme: COASTAL PROCESSES <i>Chair: Terence Day, Okanagan College</i>	Room: McDougall 329 Topic: COASTAL COMMUNITIES AND COASTAL MANAGEMENT <i>Convenor: Coastal Community-University Research Alliance (Coastal CURA)</i> The Community Forum will focus on practical issues faced by coastal communities, and lessons learned by these communities, in dealing with the management of coasts and oceans across Canada (and beyond). The forum will facilitate discussions among coastal communities, community organizations, NGOs, researchers and other participants, to explore next steps in policy and practice, and opportunities for building on connections across the country. Questions for discussion may include:	HELD CONCURRENTLY Room: Schurman Market Square Topic: SOCIAL, ECONOMIC AND CULTURAL VALUES IN SUPPORT OF INTEGRATED COASTAL AND OCEAN MANAGEMENT <i>Lead: Ray MacIsaac, Fisheries and Oceans Canada</i> This Discussion Café is a follow-up to the Paper Session held this afternoon (Tuesday, 27 July) from 13:30 to 15:00 on this topic. Room: Schurman Market Square Topic: LIFE AFTER THE OCEAN MANAGEMENT RESEARCH NETWORK (OMRN): WHO SPEAKS FOR OUR OCEANS AND COASTS? <i>Lead: Dan Lane, Ocean Management Research Network (OMRN)</i>	MUSSEL AQUACULTURE IN PRINCE EDWARD ISLAND: AN EDUCATIONAL CRUISE DOWN THE MONTAGUE RIVER <i>Organizer: PEI Dept of Fisheries, Aquaculture and Rural Development</i> The cruise will stop at one of the aquaculture leases in the Montague River to witness a typical mussel harvesting operation and see how the farmers are managing the recent tunicate fouling problem. Delegates will also get a chance to examine how the lobster fishery on the Island operates and discuss the state of the fishery. An educational lobster trap will be hauled. Dinner is included.
15:35 - 15:55	Communication networks for Integrated Management: a case study of the Placentia Bay/Grand Banks Large Ocean Management Area, Amy Tucker, Memorial University	Exploring areas of ecological significance along the Atlantic Coast of Nova Scotia for conservation planning, Aimee Gromack, Fisheries and Oceans Canada	Analysis of the short and long-term processes involved in coastline erosion, Nathan Crowell, Applied Geomatics Research Group			
15:55 - 16:15	A temporal and spatial assessment of persistent marine debris accumulation seaward of the Cardiff Bay Barrage, South Wales, UK, Michael Phillips, Swansea Metropolitan University	Management planning for Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site, Norm Sloan, Parks Canada	Coastal morphology and the implications of sand mining: West Point, Prince Edward Island, Michael Davies, Coldwater Consulting Ltd			
16:15 - 16:35	Mapping of eelgrass (Zostera marina) landscapes: data for a spatially complex mosaic, Jeffrey Barrell, Dalhousie University	Commercial fisheries closures in Marine Protected Areas on Canada's Pacific Coast: the exception not the rule, Carrie Robb, Living Oceans Society	Coastal erosion and climate change / variability impacts in the Pacific Rim National Park Reserve, British Columbia, Hawley Beaugrand, University of Victoria			

16:35 - 16:55	Challenges of successful integrated coastal zoning: lessons from the southern part of the Gulf of Thailand, Suvaluck Satumanatpan, Mahidol University	Basin Head post Marine Protected Area designation: monitoring and management, Ray MacIsaac, Fisheries and Oceans Canada	Geomorphology, sedimentology, and management issues: Hog Island (Pemanggiag) sandhills, Prince Edward Island, Norm Catto, Memorial University	• What are the most significant barriers to the participation of coastal communities in integrated ocean and coastal management? • What are the top three priorities to improve the role of coastal communities in integrated ocean and coastal management institutions? • What role should governments, research organizations, coastal communities, NGOs, and others play in overcoming the barriers and tackling the above priorities? <i>Note: Forum continues until 17:00.</i>	This Discussion Café will pose several questions: • How can the study of the human dimensions of oceans and coastal policy be delivered? • What is the role of the government in the study of the human dimensions of oceans and coastal policy? • What are the roles of researchers, coastal communities, industry, and stakeholders in contributing to oceans and coastal policy? The Discussion Café will include members of the OMRN Network Secretariat (including Maureen Woodrow, Executive Director, and Kaitlin Fahey, Coordinator), as well as OMRN Board Members, Working Groups members, and members present.	
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TUESDAY, 27 JULY 2010 - EVENING

18:00 - 19:00	McDougall Hall, Schurman Market Square POSTER SESSION AND DISPLAYS – <i>author(s) present and refreshments available</i> <i>Note: The posters will be available for viewing throughout the Conference.</i> • Aboriginal oral knowledge, Hugh Akagi, Bay of Fundy Ecosystem Partnership • Assessment of scenic preferences and aesthetic resources in Washington State coastal parks using internet-based geospatial techniques, Anthony Gabriel, Central Washington University • Basin Head post Marine Protected Area designation: monitoring and management, Marie-Hélène Thériault and Julie Whalen, Fisheries and Oceans Canada • Dalhousie University's Marine Affairs Program, Becky Field, Dalhousie University • Ecosystem indicators and tools in the Gulf of Maine, Christine Tilburg, Gulf of Maine Council on the Marine Environment • From science to policy making: investigating the use and influence of marine environmental grey literature, Suzuette Soomai, Dalhousie University • Habitat models for species at risk in the Bay of Fundy, Martha Baldwin, Dalhousie University • Identifying priority marine conservation areas on the US west coast using MARXAN, Jo Smith, The Nature Conservancy • Impacts of climate change on coastal communities and mangrove ecosystems: local vulnerabilities and local perceptions, Tiffanie Rainville, Dalhousie University • Macro- and meso-tidal wetland restoration in Canada's Maritime Provinces, Nancy Neatt, CB Wetlands & Environmental Specialists • Preliminary analysis of information needs of coastal and ocean managers, Jennifer Weldon, Dalhousie University • Quantification of coastal erosion and rock cliff recession: photogrammetric analysis and environmental monitoring, Acadian Peninsula, New Brunswick, Julie Patry-Hérard, Université du Québec à Rimouski • Towards participatory governance in the fish marketing system: Canada and the Caribbean, Sarita Williams-Peter, Dalhousie University
19:00 - 20:00	Andrew Hall 142 ANNUAL GENERAL MEETING OF THE COASTAL ZONE CANADA ASSOCIATION (CZCA) <i>Everyone is welcome - refreshments available !!!</i> The meeting will be followed by discussions of the future of the CZCA.

WEDNESDAY, 28 JULY 2010 - MORNING

08:00 - 17:00	McDougall Hall, Schurman Market Square REGISTRATION AND INFORMATION DESK					
08:30 - 10:00	Duffy 135 PLENARY SESSION					
08:30 - 09:00	OBSERVATIONS AND INSIGHTS FROM DAY 2: Social Network Update TODAY'S GOALS AND OBJECTIVES: Grant Gardner, President, Coastal Zone Canada Association					
09:00 - 10:00	PANEL AND DISCUSSION VOICES FOR THE FUTURE - PLANNING FOR THE IMPACTS OF CLIMATE CHANGE - William Kamphuis, Professor Emeritus, Faculty of Engineering and Applied Science, Queens University - Donald Forbes, Research Scientist, Geological Survey of Canada, Natural Resources Canada <i>Moderator: Michael Davies, President, Canadian Coastal Science and Engineering Association (CCSEA)</i>					
10:00 - 10:30	NUTRITION BREAK: McDougall Hall, Schurman Market Square					
10:30 - 12:00	PAPER SESSIONS				WORKSHOP	PANEL
	Room: McDougall 243 Session theme: COASTAL ISSUES <i>Chair: Sean Weseloh McKeane, Nova Scotia Dept of Fisheries and Aquaculture</i>	Room: McDougall 328 Session theme: MARINE SPATIAL PLANNING <i>Chair: Brad Barr, National Oceanic and Atmospheric Administration</i>	Room: McDougall 242 Session theme: COASTAL PLANNING <i>Chair: Karen Traversy, Coastal Coalition of Nova Scotia</i>	Room: McDougall 329 Session theme: COASTAL MANAGEMENT <i>Chair: Pete Zuzek, W.F. Baird & Associates Coastal Engineers Ltd</i>	Room: Kelley 211 Topic: WORKING TOGETHER FOR CLIMATE CHANGE ADAPTATION <i>Convenors: Gary Davidson and Beate Bowron, Canadian Institute of Planners</i>	Room: Duffy 135 Topic: CLIMATE CHANGE ADAPTATION IN ATLANTIC CANADA <i>Moderator: Will Green, Nova Scotia Dept of Environment</i>
10:35 - 10:55	Maine's working waterfront access pilot program , Hugh Cowperthwaite, Coastal Enterprises Inc	Institutional dimensions and environmental justice implications of maritime spatial planning , Elizabeth De Santo, Dalhousie University	Coastal planning for adaptation to climate change in the Halifax Regional Municipality, Nova Scotia: scenarios for a 100-year planning horizon , John Charles, Halifax Regional Municipality	The Alternative Land Use Services (ALUS) Program: going above and beyond legislation , Shawn Hill, Prince Edward Island Dept. of Environment, Energy and Forestry	The purpose of this learning module is to introduce planners and related professionals to climate change issues and to determine actions that can be taken to adapt to climate change in local communities.	• Introduction to the Regional Adaptation Collaborative concept , Mary-Ann Wilson, Natural Resources Canada • Changes to the climate in Atlantic Canada , Gary Lines, Environment Canada • Developing an Atlantic Collaborative , Tammy Keats, Newfoundland and Labrador Dept of Environment and
10:55 - 11:15	A critical look at the components of Coastal Zone Management - with reference to the Philippines and Canada , James Ross, Nova Scotia Community College	TBA	Planning for the future: preparing young professionals for coastal planning and climate change , Patricia Manuel, Dalhousie University	The indicators framework for evaluating Integrated Coastal Management in Korea , Jiyeon Choi, Korea Maritime Institute and International Ocean Institute-Canada	The workshop will be delivered in an interactive manner and will cover four main topic areas:	

11:15 - 11:35	Coastal erosion along the south eastern coastline of the Avalon Peninsula, Newfoundland, Sheridan Thompson-Graham, Memorial University	Spatial planning and legal interests: lessons from the St. Margaret's Bay, Nova Scotia marine cadastre pilot, Sue Nichols, University of New Brunswick	Marine planning as a tool to address threats to First Nations communities, Russ Jones, Haida Fisheries Program	Coastal management at the local level: developing land-use standards and best management practices for municipal and First Nation governments in the Bras d'Or Lake watershed, Nova Scotia, Jason Naug, Fisheries and Oceans Canada and Shelley Denny, Unama'ki Institute of Natural Resources	• Causes and impacts of climate change • How will climate change? Obtaining and understanding climate change information • How will my community be impacted? Assessing opportunities, risks and vulnerabilities • How can I respond? Planning your climate change response <i>Note: Workshop continues until noon.</i>	Conservation • Overview of the coastal projects of the Atlantic Climate Adaptation Solutions (ACAS) Association, Robert Hughes, New Brunswick Dept of Environment (TBC) • Discussion / questions <i>Note: Panel continues until noon.</i>
11:35 - 11:55	Modeling fecal coliform particle transportation in the Annapolis Basin of Nova Scotia using MIKE 21: examining the relationship between water quality and clam bed closures, Peter MacDermott, Applied Geomatics Research Group	Marine spatial planning and gaps in marine conservation in Washington State, Jo Smith, The Nature Conservancy	Swimming with eelgrass: a holistic science approach to integrating human and natural systems in Malibu Bay, Massachusetts, Lisa Greber, University of Massachusetts	TBA		
12:00 - 13:00	LUNCH: WA Murphy Student Building, MacMillan Hall					

WEDNESDAY, 28 JULY 2010 - AFTERNOON

13:00 - 14:30	PAPER SESSIONS			WORKSHOPS		CHARRETTE
	Room: McDougall 243 Session theme: COASTAL ISSUES <i>Chair: Michael Phillips, Swansea Metropolitan University</i>	Room: Duffy 135 Session theme: VULNERABILITY AND ADAPTATION TO CLIMATE CHANGE <i>Chair: Marc Ouellette, Fisheries and Oceans Canada</i>	Room: McDougall 242 Session theme: COASTAL ENGINEERING AND TECHNOLOGY <i>Chair: Mike Pearson, GeoNet Technologies Inc</i>	Room: McDougall 329 Topic: SCOPING A MARINE AND COASTAL RIGHTS REGISTRY FOR CANADA: NEEDS AND PRIORITIES <i>Convenors: Jean Gagnon, Natural Resources Canada and Darren Williams, Fisheries and Oceans Canada</i> A Marine and Coastal Registry (Marine Cadastre) Task Team has been established to prepare a business case for securing a long-term commitment for investment in the development of a national marine and coastal rights management regime for Canada. The purpose of the Workshop is to present the work of the Task Team to date and to receive feedback on the need for and the expected outcomes of Marine Cadastre. <i>Note: Workshop continues until 17:00.</i>	Room: McDougall 328 Topic: DECISION SUPPORT TOOLS FOR ECOSYSTEM-BASED MANAGEMENT <i>Convenor: Bruce Hatcher, Cape Breton University</i> The Workshop will explore current examples of theory and practice in the development of decision-support tools for Integrated Coastal Zone Management in Canada and beyond. Examples are the use of GIS-based scenario models to portray alternative futures in terms of land use maps and movies for watershed ecosystems under different regulatory regimes. <i>Note: Workshop continues until 17:00.</i>	Room: Kelley 211 Topic: VOICES FOR CHANGE: ACHIEVING THE WELL MANAGED COAST <i>Moderator: Colleen Mercer Clarke</i> A charrette is a problem-oriented multi-participant forum that promotes collaborative efforts to resolve specific issues in planning and design. In this session conference participants will focus on finding practical and effective solutions to the barriers that challenge coastal management in Canada. Charrette Plenary: A brief outline will be provided on the structure and expectations of the charrette process. Participants will identify the issues to be addressed by teams working in break-out sessions. Break-out session topics may include: - defining the coasts in Canada - overcoming jurisdictional conflicts - improving economic evaluation
13:05 - 13:25	Coverage of coastal zone issues in undergraduate physical geography textbooks, Terence Day, Okanagan College	Impacts of climate change on storminess and coastal erosion in the Gulf of St. Lawrence, Jean-Pierre Savard, Ouranos	Modelling the effects of reduced sea ice on storm waves, currents and sediment transport on the north shore of Prince Edward Island, Gavin Manson, University of Guelph and Geological Survey of Canada, Natural Resources Canada			
13:25 - 13:45	Remote sensing of suspended particulate matter concentrations in the upper Bay of Fundy, Gary Bugden, Fisheries and Oceans Canada	The relationship between coastal erosion and sandy beach invertebrate community structure on the north shore of Prince Edward Island, Mitchell MacMillan, University of Prince Edward Island	Mesoscale measurement and modelling of coastal foredune dynamics, Greenwich Dunes, Prince Edward Island, Robin Davidson-Arnott, University of Guelph			
13:45 - 14:05	Particle dynamics of integrated multi-trophic aquaculture sites, Lindsay Brager, Dalhousie University	Le littoral acadien du sud du Golfe du St-Laurent : vulnérabilité et résilience, Omer Chouinard, Université de Moncton	Application of ecosystem-based management principles to design erosion mitigation alternatives for Point Pelee National Park in Ontario, Peter Zuzek, W.F. Baird & Associates Coastal Engineers Ltd			

14:05 - 14:25	The role of sufficiency economy philosophy in poverty alleviation: a preliminary exploration in coastal Thailand, Ratana Chuenpagdee, Memorial University	Living by our wits: linking climate change adaptation and coastal policy in Nova Scotia, Jennifer Graham, Ecology Action Centre	Geocontainment technology in coastal protection, Andy Lister, Canadian Geocontainment Alliance			• bridging the gulf between science and management • using the Internet to advance knowledge and action • sharing existing planning tools • building coastal provincial and territorial coastal policy • empowering local action, and • improving coastal science. Charrette Plenary: Teams will regroup to present their proposed solutions, milestones and individual and organizational assignments. <i>Note: The charrette continues until 17:00.</i>
14:30 - 15:00	NUTRITION BREAK: McDougall Hall, Schurman Market Square					

WEDNESDAY, 28 JULY 2010 - AFTERNOON

15:00 - 16:30	PAPER SESSIONS			WORKSHOPS		DISCUSSION CAFÉ	CHARRETTE
	Room: McDougall 243 Session theme: COASTAL ENGINEERING AND TECHNOLOGY <i>Chair: William Kamphuis, Queens University</i>	Room: McDougall 135 Session theme: COASTAL COMMUNITIES AND CLIMATE CHANGE <i>Chair: Jean Lambert, Agriculture and Agri-Food Canada</i>	Room: McDougall 242 Session theme: VULNERABILITY AND ADAPTATION TO CLIMATE CHANGE <i>Chair: Norm Catto, Memorial University</i>	Room: McDougall 329 Topic: SCOPING A MARINE AND COASTAL RIGHTS REGISTRY FOR CANADA: NEEDS AND PRIORITIES <i>(continuation)</i>	Room: McDougall 328 Topic: DECISION SUPPORT TOOLS FOR ECOSYSTEM-BASED MANAGEMENT <i>(continuation)</i>	Room: Schurman Market Square Topic: NOVA SCOTIA'S COASTAL POLICY - ENVIRONMENTAL NON-GOVERNMENTAL ORGANIZATION PERSPECTIVES <i>Lead: Jennifer Graham, Ecology Action Centre</i> The Province of Nova Scotia is in the process of developing a Sustainable Coastal Development Strategy. This Discussion Café is an opportunity to discuss the contents of the strategy, drawing on the knowledge and experience of participants on policy options for coastal governance, zoning, land use regulations, stewardship and other key topics.	Room: Kelley 211 Topic: VOICES FOR CHANGE: ACHIEVING THE WELL MANAGED COAST <i>(continuation)</i>
15:05 - 15:25	Planning coastal infrastructure under conditions of sea level rise and climate change, Michael Davies, Coldwater Consulting Ltd	Building resilient coastal communities in British Columbia: a case study of climate change and adaptation in Ucluelet, Mary Liston, University of Victoria	Sea-level rise studies in the Maritime Provinces: what have we learned and where are we going?, Kyle McKenzie, Nova Scotia Dept. of Environment				
15:25 - 15:45	Adaptation to sea level rise, storm surges and erosion, Mike Pearson, GeoNet Technologies Inc	Coastal communities challenges to deal with climate change in the St. Lawrence River estuary and Gulf, Steve Plante, Université du Québec à Rimouski	Integrating climate change adaptation into marine and coastal management: examples from North America, Rachel Gregg, EcoAdapt				
15:45 - 16:05	The integration of ground-based and airborne laser scanning for coastal zone mapping, Tim Webster, Applied Geomatics Research Group	Impacts of climate change on coastal communities and mangrove ecosystems: local vulnerabilities and local perceptions, Tiffanie Rainville, Dalhousie University	The role of current-induced erosion in the recent proliferation of coastal protection structures along Carron Point in New Brunswick, Dominique Bérubé, New Brunswick Dept of Natural Resources				

16:05 - 16:25	Flood-risk mapping from storm surges and future sea level rise in eastern Canada, Kathryn LeBlanc, Acadia University	Vulnerability and adaptation in coastal communities: a case study of historic and current adaptation on Change Islands, Newfoundland and Labrador, Maureen Woodrow, University of Ottawa and Stages and Stores Inc	Comparative analysis: two methods of using a Geographic Information System (GIS) to determine community vulnerability to climate change in New Brunswick, Shawn Dalton, University of New Brunswick				
WEDNESDAY, 28 JULY 2010 - EVENING							
19:00 - 23:00	Peake's Wharf, Charlottetown Historic Waterfront SEAPORT SOIRÉE: Conference Banquet, featuring Prince Edward Island LOBSTER, MUSSELS, OYSTERS and LIVE ENTERTAINMENT !!!						
THURSDAY, 29 JULY 2010 - MORNING							
08:30 - 12:00	McDougall Hall, Schurman Market Square REGISTRATION AND INFORMATION DESK						
09:00 - 12:00	Duffy 135 CLOSING PLENARY SESSION						
09:00 - 09:30	CUMULATIVE OBSERVATIONS AND INSIGHTS: Social Network Update TODAY'S GOALS AND OBJECTIVES: Grant Gardner, President, Coastal Zone Canada Association						
09:30 - 10:00	PRESENTATION AND DISCUSSION VOICES FOR CHANGE: ACHIEVING THE WELL MANAGED COAST - the results of the Planning Charrette Colleen Mercer Clarke, Charrette moderator						
10:00 - 10:30	NUTRITION BREAK: Duffy 135						
10:30 - 11:30	KEYNOTE ADDRESS OIL SPILLS AND THE OFFSHORE AND COASTAL ENVIRONMENTS Mervin Fingas Dr. Fingas is a scientist focusing on oil and chemical spills. He was Chief of the Emergencies Science Division of Environment Canada for over 30 years. His specialties include: spill dynamics and behaviour, spill treating agent studies, remote sensing and detection, and in-situ burning. The 2 nd edition of his book, "Basics of Oil Spill Cleanup", was published this year. Moderator: Peter Wells, Dalhousie University and International Ocean Institute-Canada						
11:30 - 11:50	CZC 2010 DECLARATION AND CALL TO ACTION: Grant Gardner, President, Coastal Zone Canada Association						
11:50 - 12:00	INVITATION TO COASTAL ZONE CANADA 2012, RIMOUSKI, QUÉBEC: Gilles Tremblay, Fisheries and Oceans Canada						
12:05	CONFERENCE CLOSING						

Eutrophication of Prince Edward Island Inlets

*Gary Bugden, Cynthia Crane, Yefang Jiang, Herb Vandermeulen, Kerry MacQuarrie, Mike VandenHeuve

Abstract:

Nutrient enrichment or eutrophication is one of the leading causes of water quality impairment in coastal marine environments.

Eutrophication results in degraded environmental conditions such as the explosive growth of toxic or nuisance algae, loss of submerged aquatic vegetation, depleted dissolved oxygen levels in the water column and changes in aquatic community structure.

Nutrient enrichment of Prince Edward Island (PEI) estuaries due to agricultural runoff is a significant issue. Many PEI estuaries are known to experience anoxic events in which oxygen is completely depleted. A simple model incorporating only estimated tidal flushing and nitrogen loading for a selection of PEI estuaries is used with some success to predict which estuaries will experience anoxia and to estimate the loading reductions required to limit anoxic events.

Contact: Gary Budgen,
Physical Oceanographer,
Fisheries and Oceans Canada

Towards a Coastal Area Definition for Nova Scotia

Lucia M. Fanning and *Christopher Burbidge

Abstract:

Today, many national and sub-national governments around the world are establishing or revising formal coastal policies and management programs to improve the quality of life of coastal residents and address emerging social, economic, and environmental issues. An essential attribute of any coastal management program is a clearly defined spatial boundary over which the program will apply. This paper discusses the efforts undertaken by coastal management experts to assist the Government of Nova Scotia with this task. It focuses on essential criteria and potential options available for defining Nova Scotia's coastal management area so that it could effectively address six priority coastal issues identified in the province's coastal management framework.

Experts identified the human, natural and administrative criteria considered necessary for determining the appropriate areal extent for each of the six issues and recommended that coastal management efforts in Nova Scotia should focus on managing activities and impacts within an "area of interest" while minimizing upstream impacts by collaborating with other efforts occurring in an "area of influence". This "area of interest" for Nova Scotia was understood to be the area where coastal problems occur, and is distinct from the "area of influence" where problems originate.

In recommending a coastal area for management that was limited to the area where problems were occurring, the potential for duplication of effort with other initiatives currently being undertaken by the province was seen to be minimized. Additionally, the administrative challenges of attempting to manage upstream areas as part of the coastal zone were also reduced. At the same time, by highlighting both the "area of interest" and the "area of influence" as essential to effective coastal management, this approach was seen as supportive of sectoral and departmental mandates while promoting cross-sectoral and interdepartmental collaboration within the province.

Contact: Christopher Burbidge,
Dalhousie University

Small-Scale Fisheries: Connecting Human Rights, Fishing Rights and Food Sovereignty

Sherry Pictou and *Tony Charles

Abstract:

Small-scale fisheries are found around the world. Their appearance in Canada is quite different than in developing countries, but all are characterized by their operation close to shore, their use of relatively small and individually owned vessels, and their close ties – socially, culturally and economically, to coastal communities.

In recent years there has been a growing recognition of how closely some apparently diverse areas of government policy interact in affecting small-scale fishers and their communities. This is particularly true in the case of three key concerns: (a) social, economic and human rights, (b) fishing rights, and (c) food security and food sovereignty. In some cases, the connection among these is clear, as in the reality that access to food is a human right, but in other cases, interactions arise more indirectly, notably through fishery management. For example, decisions made about rights over access to the fishery and rights to be involved in managing the fishery both interact with the human rights of fishers and coastal communities, directly affecting socioeconomic wellbeing and poverty levels. Similarly, in many fisheries, such as those of Canada's First Nations and those in many developing countries, access to the fishery interacts with access to food, through impacts on food sovereignty – “the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems” (Declaration of the Forum for Food Sovereignty).

This presentation explores the three themes of human rights, fishing rights and food sovereignty, together with the various interactions among them, highlighting current efforts, particularly in civil society, to develop and promote integrated approaches to improve the wellbeing of small-scale fishers globally.

Contact: Tony Charles, Professor,
Management Science, St. Mary's University

Canada and St. Pierre and Miquelon transboundary relations: battles and bridges

Phillip Saunders and David VanderZwaag, Dalhousie University

Abstract:

Unlike the United States, Canada and the EU turned their attention to coastal and marine management relatively recently, and in different ways. Canada enacted the Oceans Act in 1996 and adopted an oceans strategy in 2002, followed by a national oceans action plan. ICZM initiatives are increasingly occurring at the provincial and territorial level. The EU adopted a community wide maritime policy in 2008 and although it took the first steps towards the development of an ICZM policy as early as 1996 it is still in the process of articulating a framework for community-wide practice. In late 2008 the EU's DG Mare adopted a potentially-ground-breaking directive concerning a Roadmap for Maritime Spatial Planning: Achieving Common Principles in the EU, but without fully resolving the relationship with parallel ICZM functions of the DG Environment and the European Environmental Agency. At the national level, by 2005 at least nine European coastal States developed ICZM strategies covering 64% of the European coastline, a much higher percentage than Canada, then or now. Some European States have had ICZM initiatives in place since the 1980s (e.g., Netherlands, France, Spain). Several of these states are now embarking on MSP initiatives, but the relationship between MSP and ICZM is not clear.

Canada and the EU have complex intergovernmental issues and processes. There are diverse policy, legislative and institutional approaches at the national level in the EU, and in the Lisbon Treaty era the Commission will need to consider how to intervene in an already crowded policy space and devise a framework that will facilitate harmonization among member states. Both Canada and the EU have diverse coastal and marine regions and place heavy emphasis on spatial planning and are developing "regional approaches;" both also need to consider long-term horizons for certain coastal actions well beyond political cycles.

Contacts: Phillip Saunders, Schulich
School of Law,
Dalhousie University

David VanderZwaag, Marine &
Environmental Law Institute,
Schulich School of Law, Dalhousie University

Participatory action research: allowing coastal communities, policy-makers and researchers to jointly explore strategies to adapt to climate change

Guy Jobbins

Abstract:

Due to low adaptive capacity, Africa is the continent most vulnerable to climate change, and African communities face complex, dynamic and diverse threats to advances in human development made over the last half century. The four research projects in this panel will explore some of these challenges in a coastal context: sustaining fisheries, coping with rapidly growing and urbanizing coastal populations, protecting natural ecosystems, and planning effective coastal protection works. The presentations will offer perspectives on how participatory action research (PAR) is helping coastal communities in Egypt, Senegal, Cape Verde, and Morocco to strengthen capacity for adaptation to climate change.

An approach that engages research users in the process, from defining the problem to carrying out and monitoring the research, participatory action research (PAR) is uniquely suited to the task of strengthening the capacity of people, institutions and societies to adapt to climate change. It privileges solving real world problems over producing papers for scientific publication, and typically involves a shared learning cycle of issue identification, planning, action, and reflection.

The four research projects represented in this panel are part of the Climate Change Adaptation in Africa Program (<http://www.idrc.ca/ccaa>), supported Canada's International Development Research Centre (IDRC) and the United Kingdom's Department for International Development (DFID), which aims to strengthen adaptive capacity to climate change in Africa.

Contact: Guy Jobbins
Senior Program Officer
Climate Change Adaptation in Africa
International Development Research Centre

Macro-tidal salt marsh ecosystem response to culvert expansion

*T. Bowron, N. Neatt, D. van Proosdij, J. Lundholm and J. Graham

Abstract:

This purpose of this paper was to examine the vegetative, sedimentary, nekton and hydrologic conditions pre-restoration and the initial two years post-restoration at a partially restricted macro-tidal salt marsh site.

Replacement of the culvert increased tidal flow by 88%. This was instrumental in altering the geomorphology of the site, facilitating the creation of new salt marsh pannes, expansion of existing pannes in the mid and high marsh zones and expansion of the tidal creek network by incorporating relict agricultural ditches. In addition, the increase in area flooded resulted in a significant increase in nekton use, fulfilling the mandate of a federal habitat compensation program to increase and improve the overall availability and accessibility of fish habitat.

The restoration of a more natural hydrological regime also resulted in the die-off of freshwater and terrestrial vegetation along the upland edge of the marsh. Two years post-restoration, *Salicornia europaea* (glasswort) and *Atriplex glabriuscula* (marsh orach) were observed growing in these dieback areas. Similar changes in the vegetation community structure were not observed at the reference site however, the latter did contain higher species richness.

This study represents the first comprehensive, quantitative analysis of ecological response to culvert replacement in a hyper-tidal ecosystem. These data will contribute to the development of long term data sets of pre- and post-restoration, and reference marsh conditions to determine if a marsh is proceeding as expected and to help with models that are aimed at predicting the response of marshes to tidal restoration at the upper end of the tidal spectrum.

Contact: Tony Bowron, CB Wetlands
& Environmental Specialists

Finding common ground on a term to facilitate improved management in a large diverse area of the earth's surface: the coastalshed

Michael J.A. Butler, *Paul R. Boudreau and Claudette LeBlanc

Abstract:

Since the publication of the Brundtland report [1] in 1987 managers, scientists and citizens have struggled to effectively describe and communicate about the geographic area of interest for integrated coastal and ocean management (ICOM). In the 1987 report, under the section "Oceans: the balance of life", it states: "Five zones bear on this management: inland areas, which affect the oceans mostly via rivers; coastal lands - swamps, marshes, and so on - close to the sea, where human activities can directly affect the adjacent waters; coastal waters - estuaries, lagoons, and shallow waters generally - where the effects of land-based activities are dominant; offshore waters, out roughly to the edge of the continental shelf; and the high seas, largely beyond the 200-mile EEZs of coastal states' control." We deal here with the first four of the five zones.

Since this report, numerous terms refer to these four zones such as "coastal and ocean", "coastal zone", etc.. None properly capture the necessary linkages among the land, freshwater, estuarine and marine ecosystems.

To address this challenge, we propose a new word "coastalshed" to simply express the area of the globe that is comprised of the ocean area under the jurisdiction of a national government, the adjacent coastal and estuarine area as well as the land and freshwater in the sub-watersheds adjacent and feeding into this marine area. Essentially we wish to extend the concept of "watershed" from the freshwater, downstream through the estuaries and out into the open ocean. The purpose is to clearly delineate a geographic area that requires integrated and collaborative management.

As a demonstrative example, we apply this model to Canada as a means of presenting some of the advantages and disadvantages of the introduction of a new term into an already difficult lexicon.

Contact: Paul Boudreau, COINAtlantic
Project Manager, ACZISC

Tourism and Fisheries: Conflict and Complementarity in Canada and the Caribbean

*P. McConney and A.T. Charles

Abstract:

The integration of tourism and fisheries poses serious challenges in coastal areas as different as those of Canada and the Caribbean.

Conflict occurs on many levels. The most obvious and often contentious is competition for physical space at sea and ashore. Hotels seek the same real estate as fishing harbours and haul out sites. Fishing boats and tour boats both require scarce berths. Fishers and tour operators may head to the same locations for plying their trade. On the other side of the coin there may be significant complementarity. Tourists seek out fishing villages for the vestiges of authentic coastal culture. Such tourists serve as sources of alternative or supplementary revenue to fishers and their households whether through tours, meals, craft, accommodation or other means. In situations of either conflict or complementarity there are livelihoods at stake. Whether coastal management decisions take into account interactions between tourism and fisheries, and whether they thereby enhance or constrain coastal livelihood opportunities, may depend on the nature and quality of governance.

Using examples from Canada and the Caribbean, we discuss these issues and the institutional arrangements for governance that may improve coastal management and livelihoods.

Contact: Patrick McConney, Senior Lecturer,
University of the West Indies Cave Hill Campus

Ecosystemic legal regime development in the Gulf of Maine: efforts and impediments

John A. Duff

Abstract:

In 1984, the International Court of Justice (ICJ), at the behest of the United States and Canada, delineated a maritime boundary – the Hague Line - between the two nations partitioning the Gulf of Maine. In doing so, the ICJ did what King Solomon would have counseled against, slicing a living system in two. Twenty-five years after the decision, with a wealth of new information about the status, trends, and challenges of the Gulf of Maine ecosystem, a simple question arises: does the Hague Line (along with other jurisdictional boundaries and delineations) facilitate or frustrate eco systemic regime building?

This paper employs a law/policy analytical framework to examine how, if at all, five boundary lines have played a role in efforts to engage in ecosystem management in the Gulf of Maine: 1) the Hague Line delineating the US-Canadian boundary; 2) the Massachusetts state-US Federal boundary line; 3) the Maine state-US Federal boundary line; and 4-5) the New Hampshire state maritime boundary lines with Maine and Massachusetts.

Contact: John A. Duff,
Associate Professor,
University of Massachusetts, Boston

Airborne LIDAR fluorescence analysis for the quantification of water quality characteristics

*Stephanie Rogers, Tim Webster, Nelson O'Driscoll and Bill Livingstone

Abstract:

The purpose of this research was to evaluate the use of a remote sensing technique from an aircraft to detect dissolved organic matter (DOM) in fresh water and estuarine environments. DOM is one of the main components associated with eutrophication in the coastal zone and can be detrimental to aquatic ecosystems. It is important to monitor and measure DOM levels to determine areas which may be susceptible to eutrophication and other water quality issues.

In August 2008, Laser Induced Fluorescence Light Detection and Ranging (LIF LiDAR) was used to assess the water quality of various areas in the Maritime Provinces. The method works by exciting particulate matter in the water using a laser wavelength of 308nm. Only a consumer grade global positioning system (GPS) used during these flights and lacked an Inertial Measurement Unit (IMU) which caused the calculated position of the fluorescent point measurements to be erroneous by hundreds of meters. Geometric corrections were performed on the LIF LiDAR dataset to facilitate comparisons with in-situ grab samples that were taken at the time of the flights. These grab samples were analyzed in the lab for dissolved organic carbon (DOC), using a total organic carbon (TOC) analyzer, and DOM, using Spectral Fluorescence Signature (SFS) analysis, similar to the method used by the LIF LiDAR. Preliminary correlation analysis tests show discrepancies between the three datasets. Broad patterns of DOM variability are clearly evident in the LIF LiDAR data which show a dilution process from the Annapolis River into the Basin and distinct differences between a highly-coloured lake and a clear water spring-fed lake on South Mountain. Investigation into the strengths of these correlations in all areas is still being conducted.

Contact: Stephanie Rogers, Graduate Student,
Applied Geomatics Research Group/Acadia University

At the table: the role of women in Prince Edward Island fisheries management

Sara Roach-Lewis, Irene Novaczek, Susan Fitzpatrick

Abstract:

This paper explores the role of women in fisheries management on Prince Edward Island (PEI). It is the result of collaboration between the University of PEI and Women for Environmental Sustainability (WES). To answer the question of who should be at the fisheries management table, it is logical to take a look at who is actively involved in fishing.

The idea to produce this exploration of women's roles in the PEI fishery came out of the recognition that women and young people could be seen on fishing boats, but the available statistics on PEI fisheries say nothing about how and to what extent women and youth are involved in fisheries or fisheries management. There are no statistics to show the numbers of men and women who are holding core licenses ("primary") and helpers' permits ("corks"), or who are engaged in work on shore and in the home (such as book-keeping, purchasing, marketing, child care, and preparing food for harvesters) that directly supports family fishing enterprises. Women and the work they do are essentially invisible - to the point where, if asked, many women engaged in fisheries-related work do not identify themselves as fishworkers.

In this research report we document the perceptions of people living in coastal communities regarding women's role in the fishery. Our participants have helped us understand some of the barriers that prevent women's participation in management and decision-making, and how management processes could be made more inclusive and effective. Our goals are:

- raise awareness and understanding of women's contributions to the fishery;
- recommend ways to make fisheries management more inclusive and effective;
- inspire and empower women who want to take their place at the management table; and
- strengthen the social economy organizations working in the fisheries sector, whether these be fishers' associations, community development agencies, or women's organizations.

Contact: Sara Roach-Lewis, Chair,
Women for Environmental Sustainability (WES)

Canada - Spain collaboration on sustainable mussel aquaculture

*R. Filgueira, J. Grant, P. Cranford, S. Robinson, M.J. Fernandez-Reiriz and U. Labarta

Abstract:

The ESSMA project (Ecological Sustainability of Suspended Mussel Aquaculture) is a Canadian – Spanish collaborative research project designed to provide sustainability indicators, modelling capacity, ecological engineering approaches to farm management, and expertise in large-scale mussel aquaculture assessments for Canadian and Spanish coastal ecosystems. The ESSMA project is a collaboration between DFO, Dalhousie University, and Institute of Marine Research, (Vigo) comprising four components with field sites in Canada (Cape Breton) and Spain (Galicia):

Component 1: Bay-Scale Phytoplankton Interactions with Mussel Aquaculture.

Objective: Directly determine the magnitude and spatial and temporal extent of phytoplankton depletion in intensively cultured embayments and recommend related, ecological indicators and sustainability thresholds.

Component 2: Food depletion and implications for farm management strategies at the local scale.

Objective: Determine the local effect of cultured bivalve biomass on phytoplankton concentration and the effect of food depletion on mussel growth, also parameterized within a mathematical model used to optimize mussel production at the local scale.

Component 3: Application of Integrated Multi-Trophic Aquaculture (IMTA) concepts to the mussel culture industry.

Objective: Evaluate the potential of the ecological engineering concept of IMTA based on a natural recycling concept where the by-products from mussel culture become inputs for another species within the same culture system, which would help to achieve a balance between commercial production and environmental sustainability.

Component 4: Carrying capacity and spatial arrangement.

Objective: Develop bay-scale carrying capacity models for optimizing spatial arrangement of aquaculture sites and determining the standing stock biomass to optimize sustainable mussel culture using a seston depletion criterion.

The overall objective of the ESSMA project is knowledge of near- and far-field bivalve environmental effects and methods for estimating and optimizing suspended bivalve production. This contributes to the development of effective ecosystem-based management tools and strategies that will promote the sustainability of the bivalve aquaculture industry.

Contact: Dr. Ramón Filgueira
Postdoctoral fellow
Dalhousie University

An Evaluation of Coastal Management Policies in British Columbia, Canada

Haley Haggerstone and Rick Wilson

Abstract:

Since 2000, the Surfrider Foundation has published an annual State of the Beach report, which is available online at www.surfrider.org/stateofthebeach. The report evaluates coastal management policies, the availability of data and information, and the status of nine key indicators of beach health in 25 coastal states. These indicators include beach access, surf zone water quality, beach erosion, erosion response, beach fill, shoreline structures, beach ecology, surfing areas and websites.

As a first step towards potentially expanding the geographic scale of this report, research was conducted in 2008 to evaluate the same beach health indicators in British Columbia, Canada. In general, coastal management in British Columbia was found to be more fragmented than in the United States. This fragmentation is due primarily to the lack of an equivalent to the Coastal Zone Management Act as well as a centralized Coastal Zone Management Agency or governing body in British Columbia. Furthermore, the geographic isolation of this coastal province creates barriers for coastal managers and agencies alike. The absence of dense coastal development along much of the coast tends to minimize common coastal management concerns involving coastal erosion and subsequent erosion response actions, such as beach fill and shoreline armoring. There are, however, issues pertaining to the overall lack of coastal water quality regulations. In marine ecosystems, water quality testing is focused primarily on fisheries as opposed to human health. Throughout the province, recreational water quality is only monitored in Vancouver and Victoria. Along the west coast of Vancouver Island water quality testing is conducted solely for the purposes of monitoring shellfish stocks.

Overall, coastal management policies in British Columbia are convoluted between the various levels of government and restricted by a lack of funding, which has resulted in an overall lack of regulations and protection for the coastal regions of the province.

Contact: Haley Haggerstone, Surfrider Foundation

Setting a new course for coastal management in Canada

*Colleen S.L. Mercer Clarke, John Roff and Shannon Mala Bard

Abstract:

For over thirty years nations throughout the world have been working to implement integrated approaches to coastal management (ICM). Yet conditions within the world's coasts have continued to deteriorate. This research sought out the shared constraints to effective ICM practice as they have been reported in the literature, and compared them to the challenges faced in Canada, where progress towards ICM has been described as glacially slow.

The research also challenged the popular myth that, as Canadian coasts are as yet largely unimpacted by human activities, we have more time to implement changes in monitoring and management. Concluding that integration is an inspiring but impractical goal, the paper suggests an alternative perspective and framework for the management of the coastal landscape. CoastWORKS sets a new course for Canadian governments and society, one that does not require either federal leadership or new institutional systems, but is based on self-organization at the provincial and local scale demanding more from the governance systems we already have in place.

Contact: Colleen Mercer Clarke,
Dalhousie University

Integrated coastal zone management in Atlantic Canada: the case of Atlantic herring

Robert L. Stephenson¹ and Daniel E. Lane²

¹ *Fisheries and Oceans Canada, St. Andrews, New Brunswick*

² *University of Ottawa, Ottawa, Ontario*

Abstract:

Management of marine activities in the coastal zone in Canada is evolving rapidly. This development is driven by the practical need to take into account multiple objectives of the marine ecosystem in a broader, more holistic and cohesive decision process, characterized by the participation of multiple and engaged decision makers. This paper reviews recent developments in integrated management processes in Atlantic Canada with particular focus on developments in the Atlantic herring fishery including efforts by federal and provincial governments, and the commercial industry to prepare a spatial-based planning program for southwest New Brunswick (the SWNB Marine Planning Initiative) and the recent review of herring management by the Fisheries Resource Conservation Council (FRCC). The case of herring demonstrates the need for a practical ecosystem approach to management, consideration of the complexities of the ecological system and interactions among activities, and a more participatory form of governance. Future challenges of effective integrated management include the rationalization of sector-based plans with area-based considerations for planning of multiple activities, and governance and decision making with authority to act operationally that will allow efficient and viable activities within an inclusive participatory structure.

Contact: Robert L. Stephenson
Department of Fisheries and Oceans
St. Andrews Biological Station

Daniel E. Lane
Telfer School of Management
University of Ottawa

Integrated Coastal and Ocean Management law and policy in the European Union and Canada: comparing approaches and lessons in complex jurisdictions

Aldo Chircop and Ryan O'Leary, Dalhousie University

Abstract:

Unlike the United States, Canada and the EU turned their attention to coastal and marine management relatively recently, and in different ways. Canada enacted the Oceans Act in 1996 and adopted an oceans strategy in 2002, followed by a national oceans action plan. ICZM initiatives are increasingly occurring at the provincial and territorial level. The EU adopted a community wide maritime policy in 2008 and although it took the first steps towards the development of an ICZM policy as early as 1996 it is still in the process of articulating a framework for community-wide practice. In late 2008 the EU's DG Mare adopted a potentially-ground-breaking directive concerning a Roadmap for Maritime Spatial Planning: Achieving Common Principles in the EU, but without fully resolving the relationship with parallel ICZM functions of the DG Environment and the European Environmental Agency. At the national level, by 2005 at least nine European coastal States developed ICZM strategies covering 64% of the European coastline, a much higher percentage than Canada, then or now. Some European States have had ICZM initiatives in place since the 1980s (e.g., Netherlands, France, Spain). Several of these states are now embarking on MSP initiatives, but the relationship between MSP and ICZM is not clear.

Canada and the EU have complex intergovernmental issues and processes. There are diverse policy, legislative and institutional approaches at the national level in the EU, and in the Lisbon Treaty era the Commission will need to consider how to intervene in an already crowded policy space and devise a framework that will facilitate harmonization among member states. Both Canada and the EU have diverse coastal and marine regions and place heavy emphasis on spatial planning and are developing "regional approaches;" both also need to consider long-term horizons for certain coastal actions well beyond political cycles.

Contact: Aldo Chircop, Professor of Law
Marine & Environmental Law Institute
Schulich School of Law, Dalhousie University

Ryan O'Leary, Dalhousie University

The socioeconomic and institutional basis for climate change adaptation in Small Island Developing States: the case of Cape Verde Islands

R. Sanches, M. Alves, J. Pessoa, L. Alves, J. Forte and A. Costa

Abstract:

Adaptation is a complex process where boundaries of natural and socioeconomic systems are fuzzy. Rural populations, including fishing communities, usually rely directly on natural resources for food, water and shelter. Their location is determined by the proximity of the natural resources necessary for their economic activities. Even modern economic activities such as tourism are extremely influenced by the availability of natural resources. Thus, any changes in the ecological system will have high impact on rural and fishing communities as well as on the tourism industry.

In Small Island Developing States (SIDS), land is an important constraint and in many cases each location is unique. Farmers and fishermen claim for technological protection against natural hazards which can be unaffordable and retreat is hardly an option for those communities.

As a consequence of climate change, an increase in social conflicts as well as a complete rearrangement of social, economic and cultural framework can be expected, leading to increased poverty.

A strategy which combines social changes and adaptive ecosystem management that build resilience into human and ecological systems and the introduction of socially accepted technologies is the most advantageous way to deal with an uncertain future in SIDS.

This paper analyzes the current socioeconomic and ecological situation in Cape Verde and Sao Tome and Principe Islands, pulling out insight for Climate Change Adaptation Strategies in SIDS.

Contacts: Anildo Costa, President, Sol & Vento

La pêche Ouest africaine au risque des changements climatiques : pour une cohérence dans les politiques d'adaptation

Cheikh Guèye, Enda Tiers Monde

Résumé :

La plupart des changements climatiques ont des impacts négatifs sur la pêche, notamment sur les écosystèmes marins et côtiers, la biodiversité des espèces halieutiques, leurs habitats. Certaines ressources halieutiques diminueront tandis que d'autres espèces à forte valeur commerciale migreront vers d'autres zones de pêche ou régions, où elles seront moins accessibles aux pêcheurs. Les stress environnementaux induits par les changements climatiques et la surexploitation des ressources vont accentuer la pression sur la pêche, et entraîneront la raréfaction des ressources halieutiques avec comme conséquence l'émergence des conflits liés à l'accès et au contrôle de ces ressources. En outre, ces impacts auront aussi des effets néfastes sur la sécurité alimentaire et les revenus des communautés qui dépendent des ressources halieutiques.

Si le secteur de la pêche artisanale en Afrique de l'Ouest concerne 5 millions de personnes et l'activité de pêche est menacée en outre par le déclin des ressources, les pratiques de pêche destructrices, la détérioration des écosystèmes et les conflits entre différentes pêches, on imagine très bien les conséquences d'une aggravation de la crise de la pêche et de la nécessité d'une adaptation rapide et de la résilience des écosystèmes marins, côtiers, fluviaux et lacustres ainsi que des communautés tributaires des ressources halieutiques, pour l'amélioration de la production de pêche et la gestion durable des ressources halieutiques.

Le programme Adaptation des Politiques de Pêche en Afrique de l'Ouest (APPECCAO) croise données scientifiques et savoirs endogènes et populaires dans une prospective partagée entre acteurs et décideurs du secteur des pêches, au niveau local, national et régional. L'entrée par les politiques et leur cohérence cherche à intégrer la pêche dans les politiques, les programmes et la planification au développement (PANA, Plan de gestion du littoral, PNAE, DSRP, Plan de secours d'urgence et de lutte contre les catastrophes naturelles, ...etc.).

Personne contacte: Cheikh Guèye
Chargé de prospectives et stratégies internationales
Enda Tiers Monde

Adaptation to sea level rise and climate extreme events: a case study from Morocco

Abdellatif Khattabi

Abstract:

The purpose of the project titled: "Enabling stakeholders in Moroccan coastal management to develop sustainable climate change adaptation policies and plans" implemented in the eastern Mediterranean coast of Morocco within the framework of Climate Change Adaptation in Africa (CCAA), funded by IDRC and DFID, is to reduce the vulnerability of coastal communities to the impacts of sea level rise, coastal flooding, and related extreme weather events. The project aims to strengthen the policy- and decision-making capacity for strategic coastal land use planning and management, and the development of specific policies and plans for the study area. Some of the research questions relate to the impacts of development and others address the difficulties in preparing strategic adaptation plans and managing uncertainty, and the role of participatory policy and planning processes. It has contributed to the goal of CCAA through improving the adaptive capacity of Morocco to reduce the vulnerability of coastal populations to sea level rise. This article outlines the challenges faced and lessons learned during the project implementation over the three years period (2007-2010).

Contact: Abdellatif Khattabi, Professor,
École Nationale Forestière d'Ingénieurs

Participatory assessment of socioeconomic vulnerability to sea level rise: case study Gamasa – Ras El Barr coastal area, Egypt

*M. Abdrabo, M. Hassaan and I. Elshinnawy

Abstract

The Nile Delta is one of the most threatened areas by sea level rise (SLR) due to physical and human factors. Although the Nile delta has attracted considerable interest of researchers focusing mainly on the biophysical impacts of SLR, little attention was given the socioeconomic vulnerability of the coastal population need to be closely examined.

The paper, in hand, intends to focus on demonstrating the value of stakeholder participation in evaluating the trade-offs between adaptation options to SLR in the stretch between Ras El Bar and Gamasa along Egypt's northern coast. The results revealed potential massive loss of socioeconomic assets due to SLR with varied degree of vulnerability in different parts of the study area and among different groups of the residents. Also, the results showed that adopting participatory approach has been facing a number of serious challenges that need proper tackling, the first of which is short term perspective for both officials and communities alike. This is due to the need to meet present pressing basic needs at the present. Moreover, the difficulty of complementing the assessment of socioeconomic impacts and vulnerability to SLR at sectoral, individual or household levels, was noticed as one of the main challenges. This is because there is a mismatch between future sectoral impacts and present perception and reaction to the issue of SLR by existing population. Dealing with such a challenge would entail carefully developing questionnaire forms and application of field surveys and consultation processes. Also, it was noted that high levels of mistrust that exists between local stakeholders and outside parties. Such mistrust need to be overcome through efficient communication strategy, that identifies target groups as well type and contents of the message, while being able to assess potential feedbacks and signals to be sent by any of those stakeholders.

Contact: Mohamed Abdrabo, Professor of
Environmental Economics, Institute of
Graduate Studies and Research-University of Alexandria

Ten years of bridging land and sea: snapshots of a collective and regional approach to sustainability in a coastal zone

Chantal Gagnon, Southern Gulf of St. Lawrence Coalition on Sustainability

Abstract:

The Southern Gulf of St. Lawrence Coalition on Sustainability was founded in 1999 to address the sustainability of a very unique and important coastal watershed – the Southern Gulf of St. Lawrence. Bridging ocean, straights, rivers and land, the Gulf is a water body that connects many different ecosystems and peoples. Resource depletion and population exodus of the 1990s inspired government, academics, businesses, First Nations and NGOs to come together to address the sustainability of the Gulf. The Coalition was created and has since been involved in numerous community, academic, governments and NGO lead projects and initiatives to address sustainable integrated management approaches to issues of importance to the Gulf and its communities.

In this presentation we would like to share the experiences gained through these 10 years. We would like to show snapshots of our initiatives and share how these have helped bridge the human relations and knowledge gaps that prevent the establishment of sustainable solutions to coastal issues. We would like to share where these initiatives are leading us and what this means for integrated coastal management, local planning and strengthening our communities in light of a changing ecological, economic and social world.

Some of our initiatives we will highlight include: Community Monitoring Programs; Community University Research Alliances; Government – NGO – Academic Collaborations (SECOA - Northumberland Straight Ecosystem Working Group); NGO – First Nations efforts in climate change adaptation; Coastal rural women and sustainability; and Sustainability Indicators.

We hope through this presentation to engage the participants in a discussion of approaches used to bridge social, economic and environmental aspects of coastal management and planning across jurisdictions, cultures and sectors of interests. We also hope to motivate the participants in wanting to become more engaged in their local community organisations and in coastal sustainability initiatives. Finally, we hope that our model can inspire participants, regardless of region, country, language or culture, to create their own regional cross-culture, cross-sector, democratically lead, bridge building efforts.

Contact: Chantal Gagnon, Executive Director
Southern Gulf of St. Lawrence Coalition on Sustainability
<http://www.coalition-sgsl.ca>

Science to Policy MPA Development Canada's Arctic Ocean Environment

Candace Newman

Abstract:

Within the next decade, ocean warming will lead to changes in the spatial location and distribution of fish species, to the creation of dead zones, areas of minimal ocean productivity, and to enhanced ocean acidification. More changes, however unknown, are expected. Despite this uncertainty, management decisions will have to be made because it is not realistic to wait for a complete and perfect understanding of these systems before committing to a path of action. From a scientific perspective, it is important to identify what biophysical changes can be expected in Canada's Arctic Ocean environment. From an analyst perspective, it is important to identify how this information can be appropriately integrated into marine protected area objectives and planning.

In this study, we ask the question, "What biophysical information about the arctic will be most important for setting policies and regulations?" To this end, we investigate existing predictive biophysical models and their outputs and accuracies, and determine a means of evaluating their usefulness for informing policies. We also explore existing MPA Arctic policies from around the world and determine how they may contribute to enhancing Canada's priorities for managing the Arctic Ocean environment.

Contact: Candace Newman,
Science and Technology Policy
Advisor, Natural Resources Canada

Our Coast: The role of “State of the Coast” reporting in addressing Nova Scotia’s priority coastal issues

Sean Weseloh McKeane

Abstract:

In December of 2009 the Government of Nova Scotia released the “State of Nova Scotia’s Coast Report”. This report, the first of it’s kind in Atlantic Canada, gives an overview of the condition of Nova Scotia’s coastal areas and resources. It describes physical, ecological, and socio-economic characteristics of the coast, and examines in more detail six priority coastal issues. The report provides a baseline of information from which to determine future trends, and more importantly acts as a starting point for informed discussion both inside and outside government.

This presentation will discuss the challenges and opportunities that arose while developing this report, key findings, and how the Government of Nova Scotia is using this information to move forward to develop a Coastal Strategy.

Contact: Sean Weseloh McKeane, Coastal Coordinator,
Nova Scotia Department of Fisheries and Aquaculture

A proposed risk-based management approach for managing activities affecting Canada's oceans

Darren Williams and *Martine Giangioppi

Abstract:

Fisheries and Oceans Canada (DFO) is moving toward ecosystem-based and integrated management. Ecosystem-based management is the management of human activities so that marine ecosystems, their structure, function and overall environmental quality are not compromised and are maintained at appropriate temporal and spatial scales. It recognizes that human activities must be managed in consideration of the interrelationships between organisms, their habitats and the physical environment, based on the best science available. It also means taking into account cumulative impacts of all human activities on the ecosystem within that area.

The Oceans Directorate within DFO is developing an Integrated Oceans Risk Analysis Framework as part of the ecosystem-based management toolbox. The Framework outlines the stages involved in undertaking a risk analysis, as well as a rationale for doing so. The benefits of risk analysis include the ability to justify and defend decisions, view risk objectively, prioritize resources, identify research and information needs. It is a tool intended to provide decision-makers with an objective, repeatable and documented assessment of the risks posed by a particular course of action. A risk-based approach helps managers prioritize issues and focus efforts related to activities which are considered to have the greatest potential impact.

Risk-based decision-making approaches are recognized by DFO as a key to effective ecosystem-based management. The Framework will provide viable management options to decision-makers and integrated oceans management practitioners based on the level of risk associated with activities that affect oceans resources. Since the scope of the Framework is intended to include all oceans activities in or affecting Canada's estuarine, marine and coastal waters it could also be used by stakeholders, scientists, other relevant experts (i.e. economists, sociologists), other federal government departments, provincial departments, Aboriginal people, First Nations and the general public.

Contact: Martine Giangioppi,
Oceans Advisor,
Fisheries and Oceans Canada

Community-led Integrated Coastal Zone Management: Case Study from Malpeque Bay, Prince Edward Island

Olando Harvey

Abstract:

The Oceans Act 1996 highlights amongst other principles, Canada's commitment towards Integrated Coastal Zone Management (ICZM). The Oceans Act assigns the Department of Fisheries and Oceans the role of developing and implementing ICZM programs to manage activities affecting the marine environment in collaboration with relevant stakeholder. Consequently, this paper sets forth a framework for the development and implementation of a community-led Integrated Coastal Zone Management (ICZM) program.

The paper accomplishes this by first outlining the theoretical approach to the process of program development and implementation; then utilizes the Malpeque Bay, Prince Edward Island as the case study for practical application of this theoretical approach. The fact that the a significant proportion of the user conflicts that currently exist within Malpeque Bay can be directly attributed to sector-base management of the four major sectors (fishing, aquaculture, aquaculture and tourism) utilizing the limited space of the bay coupled with expressed interest of the island's First Nations to develop and implement a community-led ICZM initiative makes the Malpeque Bay an ideal case study for this new framework. The paper outlines the stages of developing and implementing an ICZM program; the organisational structure of the management body; methods for achieving stakeholder participation; and various decision support methodologies.

Contact: Olando Harvey, Graduate
Student, Dalhousie University

Satellite Remote Sensing in the Mackenzie River Delta

*Michael Brown and Jonathan Grant

Abstract:

It is predicted that due to global climate change, precipitation patterns worldwide will be altered, thereby directly affecting river volumes, and ultimately the coastal regions into which they discharge. Originating in the Great Slave Lake, the Mackenzie River is the second largest river system in North America, and the fourth largest opening into the Arctic Ocean. Given its immense size, and its proximity to the Arctic, it is likely that the effects due to climate change in the coastal region of the Mackenzie River at its opening in the Beaufort Sea will be both significant and pronounced.

It is therefore necessary to monitor the river delta so that future effects of climate change may be assessed, and proper management tools can be in place. Unfortunately the dynamic nature of coastal waters does not allow most traditional field methods to fully capture their range and variability. In contrast, satellite remote sensing can provide data that is both frequent and of a necessary spatial resolution to assess these complex waters.

Here we summarize recent findings of a current project that uses high-resolution (250 meter) MODIS-Aqua imagery as an index of turbidity in the Mackenzie River Delta. This imagery allows for the spatial and temporal characterization of turbidity within the delta. A unique aspect of this project is the existence of an in situ turbidity dataset we collected. These measurements, along with local wind speed, rainfall, and river gauge data can be used to ground truth the satellite imagery. As a result we can construct synoptic maps of satellite-based turbidity that can be incorporated into regional models.

Contact: Michael Brown, Visiting
Researcher, Dalhousie University

Key Elements of Ocean and Coastal Governance: Values, Images and Principles

*Ratana Chuenpagdee and Svein Jentoft

Abstract:

Ocean and coastal governance is a challenge posed mainly by the diversity, complexity and dynamics of the oceans and coasts, as well as their spatial and jurisdictional scales. These characteristics call for an integrated approach, which has been widely endorsed and implemented, often with an emphasis on the inclusion of a broad range of stakeholders in the participatory planning and decision-making process.

Some have argued that this approach has a tendency to undermine the importance of the basic scientific and integrated knowledge about the oceans and coasts that should inform management decisions, especially when too much effort is oriented toward reconciling multiple use conflicts.

Here we submit that the premise for sound ocean and coastal governance goes beyond scientific knowledge and stakeholders' participation, but rests upon the understanding of the values (V), images (I) and principles (P) that influence, drive and motivate stakeholder's actions and behaviour. An exploration into the V-I-P and how these meta-level elements inter-relate and inform governance structures and mechanism is an area of research that is required for initiatives such as ocean zoning, marine spatial planning and integrated coastal management that are being implemented around the world. The baseline knowledge about V-I-P also helps enhance the robustness of the governance system.

Contact: Ratana Chuenpagdee,
Associate Professor,
Memorial University of Newfoundland

Airborne LiDAR for coastal zone risk mapping in the Maritimes

Tim Webster

Abstract:

Several coastal areas around the Maritimes have been surveyed with airborne LiDAR sensors to construct high resolution digital elevation models (DEMs). This type of sensor uses a narrow laser pulse that is able to measure ground elevations to a high precision even under the forest canopy. These high density high precision elevation points are used to construct bare earth DEMs that can be used to route water flow utilizing a GIS.

The Maritimes experiences storm surges, which are a result of low atmospheric pressure and wind raising the water level, on the order of 1-2 m above normal levels. When storm surges coincide with high spring tides many areas are at risk of coastal flooding and erosion. There have been several studies utilizing this technology to construct flood risk maps including: Charlottetown, PEI; southeast New Brunswick and Annapolis Royal, NS. GIS is used to map the storm surge still water level and route the water on-land ensuring connectivity of the ocean to the low lying areas inland. In order to determine the risk or probability of a high water event occurring, a time series of water levels are analyzed.

Tide gauge records provide these data in order to generate the return periods of high water events and can be assigned to the flood inundation maps to produce flood risk maps. Future sea-levels projections as a result of climate change and local crustal subsidence can be incorporated into the probability statistics of high water levels.

Natural Resources Canada has recently funded a climate change adaptation project with the Atlantic Provinces (Regional Adaptation Collaboration – RAC). One component of this project is to evaluate the coastal risk for several communities in Nova Scotia utilizing LiDAR. The communities include: Yarmouth, Lunenburg County, Minas Bite, Oxford to Port Howe, and the Tantramar marsh-Amherst Fundy shore.

Contact: Tim Webster,
Research Scientist,
Applied Geomatics Research Group

Information management for Integrated Coastal and Ocean Management

Paul Boudreau, ACZISC Secretariat

Workshop Abstract:

Integrated Coastal and Ocean management (ICOM) must deal with the management of space and resources that span land, freshwater, estuarine and marine environments. It also involves consideration of environmental and socio-economic factors. As a result, effective ICOM requires a great deal of information from a wide variety of sources, and this information needs to be shared amongst federal, provincial and municipal agencies, First Nations, academia, NGOs, etc.

Some of the challenges of getting timely access to accurate data are being addressed by modern mapping and information management technologies. Yet, with all of the technologies that are available, success comes down to individuals and agencies providing appropriate and secure access to their information in formats that managers can use.

The Workshop will highlight progress in, and the continuing challenges of, information management. Presenters will provide overviews of information management, online mapping and the latest in research on assessing the impact of information on management. Following the opening comments, an open discussion will be promoted amongst all participants in an effort to develop a common view on the current state of information management for ICOM and the priorities for future improvement.

Presenters include:

- Paul Boudreau, ACZISC Secretariat
- Justin Huston, Nova Scotia Dept of Fisheries and Aquaculture
- Mary Lynn McCourt, Prince Edward Island Dept of Environment, Energy and Forestry (TBC)
- Elaine Toms, Dalhousie University
- Bertrum MacDonald, Dalhousie University
- Peter Wells, Dalhousie University, International Ocean Institute - Canada and Bay of Fundy Ecosystem Partnership

Contact: Paul Boudreau
COINAtlantic Project Manager
ACZISC Secretariat

Trans-boundary environmental indicators: making complex systems understandable

Susan Russell-Robinson

Abstract:

Environmental indicators have been developed for three settings in the Canada-United States trans-boundary region: Puget Sound-Georgia Basin, Great Lakes and Gulf of Maine. While the three efforts seek to assess the state of ecosystems based on accepted indicators, there are a number of differences between the efforts, including the criteria for selecting indicators, the approaches for collecting data on annual and seasonal bases, and methods for delivering information to targeted users. Participants will hear from representatives of the three indicator efforts, who will describe and illustrate the different indicator suites, showcase products designed to strengthen decision making and environmental management, and discuss lessons learned from working with decision makers and other user groups. Additionally, there will be a presentation about partnering between Coast Salish Nation, members of western Washington Tribes and British Columbia First Nations and the U.S. Geological Survey to blend traditional knowledge and science to help understand and manage environmental resources and protect mother earth. During annual summer canoe voyages in Puget Sound and the Strait of Georgia, measurements are made of current water quality conditions and compared with data collected during other journeys. A panel session will follow the presentations, where audience participants will be asked to pose questions about the indicator programs, facilitating comparison between the three programs and stimulating ideas about new directions for data collection, use of indicators and communication with stakeholders.

Contact: Susan Russell-Robinson,
Associate Program
Coordinator, U.S. Geological Survey/DOI

Incorporating the coastal concerns of primary stakeholders in St. Margaret's Bay, Nova Scotia into the planning and management of the coast

*Alexi Baccardax, Cathy Conrad and Lucia M. Fanning

Abstract:

The use of the coast of St. Margaret's Bay (SMB), Nova Scotia, is changing and this is a cause for concern for the residents of the SMB area. Some of these changes and their causes include decreased public access to coastal land, degrading water quality, sea level rise and rapid development projects.

Currently, mechanisms to transfer community based knowledge to decision makers in SMB are weak. Often community actions in the management of SMB coast are solely reactionary, initiated when a proposed activity or activity in progress is seen as inappropriate. This is of particular frustration to primary coastal stakeholders, including the St. Margaret's Bay Stewardship Association (SMBSA), which is one of the main organizations in the area that tracks and responds to environmental changes. The lack of efficient mechanisms to determine what coastal stakeholders view as important issues, and to incorporate these concerns into planning and management of the coast, is not an issue in SMB alone. Neither is the lack of integration among departments an apparent requirement for planning and management. It is repeated in every coastal community in Nova Scotia and is not unlike many coastal communities in various provinces around Canada.

This paper will discuss (1) how the coastal concerns of the residents of SMB are currently being collected and incorporated into planning and management by decision makers; (2) analyze how this process can be improved; and (3) assess what can be learned about improving the process, using Bluenose Coastal Action Foundation, (based in Mahone Bay), Nova Scotia (NS), as a case study for comparison.

Contact: Alexi Baccardax,
Graduate Student,
Dalhousie University

Recent shoreline changes in the western Canadian Arctic

*Dustin Whalen, Steve Solomon, Donald Forbes and Gavin Manson

Abstract:

Coastal change in the western Canadian Arctic has been documented using aerial photography and ground based measurements at various time intervals between 1952 and 2000. Much of the coastline is known to be eroding at long term rates of 1-2 m/a but can be in excess of 20 m/a. Past studies have suggested that decadal rates of change for this region have remained relatively constant since 1972.

Recently acquired topographic LiDAR data, aerial photography and satellite imagery will be used to look at annual to multi-annual coastal change rates in the Mackenzie Delta and surrounding region over the past 8-9 years. Preliminary work suggests that annual rates of erosion for the study area increased slightly over this time period. Contributing factors that have lead to the increase of coastal erosion in the past decade may include increased magnitude and frequency of storms and slope instabilities of the bank related to the thaw of ice-rich sediments.

The combination of different digital data sources in a GIS and high resolution ground-based measurements will be used to calculate these findings where available. In addition to coastal regions, a number of inland lakes and river banks will be included in the study to show the correlation between areas where thaw induced slope failure processes may control rates of change and exposed coastal areas where rates are possibly controlled more by meteorological and hydrodynamic forcing and local to regional sediment dynamics. A better understanding of coastal erosion and its relationship to the changing morphology of coastal and inland waterways will aid in future decision-making for development and management of one of the most rapidly changing coastlines in the world.

Contact: Dustin Whalen,
Geological Survey of
Canada, Natural Resources Canada

The Importance of legislative frameworks for Integrated Coastal Zone Management programmes: a case study of the India experience

Tony George Puthucherril

Abstract:

The unique characteristics of coastal eco-systems which primarily involve inter-linkages between the aquatic and terrestrial components of these eco-systems and the close interface between humans and these components necessitates that there be a unique management framework to sustainably manage these areas and resources.

Integrated coastal zone management has been developed as the key management response to meet this challenge. So crucial is the value of this tool that in coming years it will be the primary mechanism within which adaptive responses will have to be built-in to deal with the far reaching impact of climate change on coastal areas and resources particularly that of sea level rise. In fact, integrated coastal zone management is widely being touted as the ultimate panacea to most of the problems that impair the sustainable development of coastal areas and resources. However, several of the ICZM programmes as is currently conceived and implemented in several coastal countries have failed to deliver. Even though reasons can be many and varied, one major factor is the lack of sufficient legislative support for such programmes.

Accordingly, the objective of this paper is to understand whether it is absolutely necessary to have a legislative framework to facilitate the operation of ICZM? In other words, are we to have coastal zone management legislation as a condition precedent before initiating programmes for ICZM? For a pointed analysis, the present study will examine the Indian legislative experience on Coastal Zone Management. India has been chosen for this case study as the problems facing the coastal regions of this country and the kind of responses that have been crafted to manage these concerns, goes to the very root of some of the critical issues which coastal managers are frequently confronted with while operationalising integrated coastal zone management programmes.

Contact: Tony George Puthucherril, JSD Candidate,
Schulich School of Law, Dalhousie University

A pilot project for the conservation of capelin in the estuary and the Gulf of St. Lawrence using a risk-based approach

Martine Giangioppi and *Gilles Tremblay

Abstract:

Pathways of effects (PoE) are graphic conceptual models that describe how human activities can cause change in an ecosystem and, in turn, have impacts on societies, cultures and economies. They illustrate the pathways along which effects propagate from human-induced pressures to effects on ecosystem components.

PoE models are a key component of ecosystem risk management. They enable decision-makers to gain a better understanding of the issues in order to be able to identify priorities and focus their efforts on the management and regulation of activities that have the most significant impacts on marine ecosystems.

A PoE pilot project on capelin conservation was carried out in 2009 by Fisheries and Oceans Canada, Québec Region. Capelin is a forage species that plays a key role in the St. Lawrence food web by transferring energy from primary and secondary producers, on which it feeds, to higher trophic levels, which feed on it. The beaches used by this species as spawning habitat are often exposed to major human-induced stresses. Biological, sociocultural and economic PoE models have been developed by a departmental multidisciplinary working group to identify potential issues.

The next step in the project is to characterize the risks that may arise from pressures on capelin conservation in order to prioritize the issues. The costs, benefits and impacts on the social, financial and environmental aspects of various scenarios of impacts on spawning habitat and capelin abundance will be identified during this step. The various stakeholders in capelin conservation will be involved.

Contacts: Gilles Tremblay,
Fisheries and Oceans Canada

Martine Giangioppi,
Fisheries and Oceans Canada

The value of maritime heritage to Arctic conservation

Brad Barr

Abstract:

Potential threats to Arctic resources from the expansion of human uses resulting from climate change are being widely discussed and analyzed. To most effectively address these critical issues, it is essential to build awareness, interest and support of the public and decision makers. Fortunately, the Arctic has a rich history and heritage, with compelling stories that capture the imagination of the public. The value of the investigation and preservation of this heritage is important in itself, but the value to raising awareness and building a broader constituency of support for Arctic research, conservation and management can be greatly enhanced by integrating a focus on Arctic maritime heritage. The current NOAA/ONMS "Lost Fleets of the Western Arctic" initiative, investigating and interpreting the demise of commercial whaling in North America, is an example of how such a project can accomplish this important goal.

Contact: Brad Barr,
Senior Policy Advisor,
NOAA Office of National Marine Sanctuaries

The Arctic Council Working Group for Protection of the Arctic Marine Environment's contributions to coastal and ocean governance

Renée Sauvé and *Julie Potter

Abstract:

The Arctic has become an area of intense international focus as conditions in the Region continue to change due to the effects of climate change, and as new opportunities and challenges continue to emerge. The changing environment and increased focus make it increasingly important for Arctic states to demonstrate leadership in the Arctic, and their ability to effectively govern the Arctic marine and coastal environment.

The Working Group for the Protection of the Arctic Marine Environment (PAME) is the marine working group of the circumpolar Arctic Council responsible for promoting the conservation and sustainable use of the Arctic Ocean. PAME considers a full range of policy issues related to the state of the Arctic marine environment, including pollution prevention, marine biodiversity, and marine resource development, and conducts projects that are intended to inform and advise decision-makers of important issues and trends. For example, PAME recently conducted the world's first comprehensive Arctic Marine Shipping Assessment (2009), and is in the process of conducting a multi-phased Arctic Ocean Review project, which will review existing international framework and measures that are in place for the conservation and sustainable use of the Arctic marine environment.

PAME's work is essential to protecting the Arctic marine and coastal environment by supporting initiatives that increase our understanding of marine issues in the Arctic and push for greater circumpolar cooperation for stronger norms and environmental standards for effective governance of the Arctic Ocean. PAME activities will assist with improving the health, productivity, and overall protection of the Arctic marine and coastal environment, as well as assist Arctic States in demonstrating their ability to effectively govern the Arctic Ocean.

This presentation will highlight the important work of PAME and Canada's contributions from an international policy perspective; and, how this contributes to effective coastal and ocean governance in the Arctic.

Contact: Julie Potter,
International Fisheries Officer,
Fisheries and Oceans Canada

Nova Scotia Coastal Infrastructure Risk Assessment

*Andrew McGillis, Ian MacCallum, Chris Moir and Pete Zuzek

Abstract:

Baird recently completed Phase 1 of a Province wide risk assessment for holdings of the Nova Scotia Department of Transportation and Infrastructure Renewal. The pilot study was focused on highway infrastructure at risk to coastal erosion, flooding, storm surges and sea level rise. The investigation quantified current design parameters, such as extreme water levels (tides and storm surge) based on historical trends and for anticipated sea level rise scenarios. At each site, a variety of engineering alternatives were developed to mitigate the risks, which in some cases involved re-locating the infrastructure. The ultimate goal was long-term sustainable infrastructure that would withstand future coastal forces and minimize maintenance costs.

Contacts: Andrew McGillis, W.F. Baird &
Associates Coastal Engineers Ltd

Ian MacCallum, NS Department
of Transportation and Infrastructure Renewal

Chris Moir, NS Department of
Transportation and Infrastructure Renewal

Pete Zuzek, W.F. Baird
& Associates Coastal Engineers Ltd

Building Capacity for Integrated Coastal Management: Civil Society Engagement in the High Schools

*Velta Douglas, Maria Recchia and Melanie Wiber

Abstract:

This paper reports on an innovative high school curriculum module that introduces integrated coastal management problems to high school students. The module focuses on management problems in Saint John Harbour, New Brunswick, and seeks to build capacity for civil society engagement in coastal zone management. The module was tested in three separate high school classes in two different Saint John high schools and was designed to meet curriculum needs in English. It included student involvement in media production, as well as a mock stakeholder's meeting. The paper will provide results on student levels of engagement and on media outcomes. It will also provide some discussion of the appropriate grades and subjects in which problems of resource management can be introduced.

Contacts: Velta Douglas,
University of New Brunswick

Melanie Wiber, Professor,
University of New Brunswick

Coastal Management: bridging the land-water divide

*Marc Ouellette and Roland Cormier

Abstract:

The coastal zone is a complex mosaic of variable zones of influences along the land-water interface. It is an area of high ecological complexity and productivity given its intrinsic connectivity between habitats and processes of the freshwater and marine aquatic ecosystems. Also, it is an area of complex anthropogenic interactions with variable social, cultural and economic components. Furthermore, it is the zone where aquatic ecosystems are the most vulnerable to pressures caused by human activities where management lies within a complex jurisdictional backdrop. Canada is a maritime nation. It is bordered by the Pacific, Atlantic and Arctic Oceans, it as the world's longest coastline (at about 244,000 km), and also borders interior freshwater 'seas', the Great Lakes. Eight out of our ten provinces border on the oceans, as do our three Territories. Given this backdrop, integrated coastal management seems a formidable challenge, but it is possible and it is critical that we do it efficiently.

Under the Health of the Oceans Initiative, four Centre of Expertise were established within the Oceans sector of the Department of Fisheries and Oceans in order to better understand and address integrated coastal and oceans management issues. The objective of the CoE on Coastal Management is to clarify DFO's role in coastal zone management in relation to its Federal, Provincial and Territorial partners. Given that the primary role of DFO in coastal management is related to informing relevant jurisdictions in their decision-making processes, the CoE will focus its efforts in the development of ecosystem-based frameworks and tools in relation to cumulative effects and risk assessments. It will leverage products and practices presently developed for large oceans management areas. This will be achieved via a network of regional, national and international experts validating approaches and also contributing to the overall knowledge base of coastal management practices.

Contact: Marc Quellette, Coordinator,
Oceans Centre of Expertise on
Coastal Management, Fisheries and Oceans Canada

Ecosystem-based management and science tools for coastal communities

Jon Grant

Abstract:

Coastal communities are faced with a variety of planning and development issues, including impacts from agriculture, aquaculture, industry and urbanization. The challenge of ecosystem-based management is to integrate health and sustainability of the coastal environment with the well-being and prosperity of coastal residents.

Science tools that measure system health are a vital part of this equation. Traditionally, environmental impacts are measured in a very local sense, with little attention to the far field. However, the far-field is the link to effects at the ecosystem scale. Science tools applied in support of these goals must be applicable at multiple spatial scales, cost effective, sensitive to habitat quality objectives, and available to implementation and participation among coastal residents.

Among these tools, sediment profile imaging (SPI) is presented as an ideal indicator of benthic health. GIS is used in mapping SPI at ecosystem (baywide) scales, and geostatistics used for quantitative analysis. Examples and application to coastal Nova Scotia are presented with specific reference to aquaculture impacts and community involvement.

Contact: Jon Grant,
Professor,
Dalhousie University

Institutional Gaps in Canadian Community-Based Management: the Case of the Fundy Fixed Gear Council

Carolea White and Hubert Saulnier

Abstract:

In a recent paper, Peacock and Annand (2008) argue that support for community based management of the groundfish fleet in the Scotia Fundy region is provided by the Department of Fisheries and Oceans (DFO). The DFO ensures that overall conservation objectives are met and that community allocations are respected (p. 106). They also specify that individual vessel landings are provided to boards to assist them in their management efforts. Recent reports from groundfish management boards in the Bay of Fundy, however, suggest that the government has failed to meet its obligations in this regard, and is seriously undercutting the effectiveness of community based management in the process.

The Fundy Fixed Gear Council was formed in 1996 to manage groundfish quota, which was allotted to the Digby Management Board by the DFO. The Digby Management Board must divide this quota amongst its 150 members in the Fixed Gear less-than-45-foot boat sector. Increasingly it has been difficult to receive accurate up-to-date landing reports for the group or for individual fishermen in a timely fashion. With the 100% Dockside Monitoring imposed on the fishermen at their expense, it is unclear to the Digby Management Board why it is so difficult to get these reports to the FFGC quickly. There are extreme consequences for the fisherman should he go over the allotted quota. This is just one example of the institutional gaps that exist between the status quo and the theory of community-based management. If the DFO will not work effectively with the management boards, community-based management cannot succeed.

Contacts: Carolea White,
Fundy Fixed Gear Council

Hubert Saulnier,
Fundy Fixed Gear Council

Linking land to ocean in coastal planning: a comparative study of municipalities in Iceland and Norway

Morten Edvardsen

Abstract:

On the basis of a comparative study of Stryn/Stranda in Norway and Isafjordur in Iceland, the author is searching for the links between land use planning (LUP) and water resource management (WRM), especially the sea part. The study is also considering the possible links in public planning to the mediation of geohazards, which are prominent in both locations.

Contact: Morten Edvardsen,
Professor,
Norwegian University of Life Science

Piloting the Mapping of Socio-cultural Values and Place Attachment on a Small Island

*Irene Novaczek, Ann Howatt, Josh MacFadyen and Fogho Ikede

Abstract:

As climate change unfolds, Prince Edward Island, Canada will be vulnerable to impacts including sea level rise, changing precipitation, destructive storms, salt water intrusion and coastal erosion. Losses of natural and built heritage will have serious implications for mental health and general well-being of the population. Having tools at hand that provide some degree of local control, advance planning, adaptive action and emergency preparedness will help reduce or mitigate losses and associated stress.

Because of their acute vulnerability, manageable scale and clear boundaries, small islands are increasingly active sites for research into climate change impacts and human responses, and test sites for the new forms of collaborative decision-making and governance that will be required to cope with impacts of climate change in coastal zones. The Institute of Island Studies is testing approaches to socio-cultural values mapping in the coastal zone, using Prince Edward Island as a test site. This presentation will explain how we are documenting socio-cultural values and place attachment using GIS technologies that will allow the data to be overlaid with climate change scenarios. The intent is to stimulate discussion, planning and action at the community level to adapt to projected climate change impacts.

Contact: Irene Novaczek,
Institute of Island Studies

Linking Cultures to Protect Mother Earth: Governance for Conservation

H. Akagi, C. Gagnon and *M. Janowicz

Abstract:

As a follow-up to two Talking Circles held in 2009, and in an effort to further develop an understanding between the Aboriginal and non-Aboriginal communities on the meaning of “conservation”; CZ2010 is seen as the perfect opportunity to bring together many of the original Talking Circle participants while allowing any others who might be interested to participate.

One of the many messages from the two talking circles already hosted by BoFEP, the Passamaquoddy Nation, the NB Conservation Council, the Southern Gulf of St-Lawrence Coalition on Sustainability and Saint Thomas University Native Studies, is how the concept of conservation is deeply rooted within each culture, yet inextricably different between the cultures.

Westerners see Conservation as a fairly recent concept based on a deepening interest in preserving portions of the natural world in the midst of the pillage created by the paramount incentive of economic gain. Aboriginals who have either maintained or recovered their culture; however, see this as a means of preserving life for all creatures while protecting Mother Earth for all future generations.

This workshop will explore the evolution of Western concepts of Conservation. It will also explore the foundations of Aboriginal culture (traditional governance structures and oral traditions) seeking ways of re-forging the relationship among cultures to protect Mother Earth.

This session will include: two speakers on the Western tradition of Conservation and two speakers on Traditional Aboriginal governance and oral tradition. This will conclude with a half hour question and answer session.

Contact: Marianne Janowicz,
Vice-President, BoFEP

Community Adaptation to Coastal Climate Change: Canada and the Caribbean

John D. Clarke and *Dan Lane

Abstract:

In 2007, a group of researchers in Canada and the Caribbean came together under the leadership of the Telfer School of Management, University of Ottawa and the University of the West Indies, St. Augustine, Trinidad and Tobago to propose a project on assisting coastal communities in adapting to the impacts posed by projected sea level rise and severe storms associated with climate change.

As one of the first four successful projects of the new ICURA (International Community-University Research Alliance) program sponsored by SSHRC and IDRC, the C-CHANGE project is now in the first year of a five year term. Working with interdisciplinary teams drawn from universities and the private sector of both Canada and the Caribbean, community partners in both areas will work to identify and map affected infrastructure, to assess their vulnerabilities, to develop risk management scenarios, and to prepare Community Adaptation Action Plans to address the anticipated changes. Project community partners include Charlottetown (PE), Isle Madame (NS), Gibsons (BC), and Iqaluit (NU) in Canada, and Georgetown (Guyana), Bequia (the Grenadines), the Belize Barrier Reef, and Grand'Rivière (Trinidad) in the Caribbean.

While the response mechanisms proposed for each community will reflect the unique conditions created by local environments, socio-economic conditions, cultures and governance systems, the methodologies employed are intended to be transferable to other communities facing similar challenges. C-CHANGE will also contribute to local capacity building and to the development of university curricula in Canada and the Caribbean.

Contacts: John D. Clarke,
C-Change Operations Manager

Dan Lane,
Professor, Telfer School of
Management, University of Ottawa

Trans-boundary environmental indicators: making complex systems understandable

Susan Russell-Robinson

Abstract:

Environmental indicators have been developed for three settings in the Canada-United States trans-boundary region: Puget Sound-Georgia Basin, Great Lakes and Gulf of Maine. While the three efforts seek to assess the state of ecosystems based on accepted indicators, there are a number of differences between the efforts, including the criteria for selecting indicators, the approaches for collecting data on annual and seasonal bases, and methods for delivering information to targeted users. Participants will hear from representatives of the three indicator efforts, who will describe and illustrate the different indicator suites, showcase products designed to strengthen decision making and environmental management, and discuss lessons learned from working with decision makers and other user groups. Additionally, there will be a presentation about partnering between Coast Salish Nation, members of western Washington Tribes and British Columbia First Nations and the U.S. Geological Survey to blend traditional knowledge and science to help understand and manage environmental resources and protect mother earth. During annual summer canoe voyages in Puget Sound and the Strait of Georgia, measurements are made of current water quality conditions and compared with data collected during other journeys. A panel session will follow the presentations, where audience participants will be asked to pose questions about the indicator programs, facilitating comparison between the three programs and stimulating ideas about new directions for data collection, use of indicators and communication with stakeholders.

Contact: Susan Russell-Robinson,
Associate Program
Coordinator, U.S. Geological Survey/DOI

Alternative Dispute Resolution: Can it advance the stated policies of Integrated Management in Canadian Fisheries and Oceans?

Courtenay E. Parlee

Abstract:

Over centuries, government regulators in Canada have put billions of dollars into researching the 'best methods' for managing the fisheries and oceans (Wiber & Bull, 2007). Currently the government has agreed to a policy initiative in support of IM by signing the UNCLOS, the Oceans Act and the Oceans Strategy. IM has been described as: "a contentious and dynamic process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources" (Bastien- Daigle et. al. 2008, p.97 in Wiber & Bull, 2009, p.2). One component that requires integration amongst the many different stakeholders in the fisheries and oceans is the problem of conflicting uses (McFadden 2008 in Wiber & Bull, 2009, p.2).

My research focuses on methods of conflict resolution in IM and I am developing a case study of a recent conflict in coastal management to understand the various positions of stakeholders and regulators. The conflict I have selected to analyze is between government regulators and Clam harvesters in Clam Harvesting Area 2 and I will assess consultation and conflict resolution processes in connection with the renewal of the leases in St. Mary's Bay and the new CSSP classifications. It will be examined through an ADR lens, more specifically, a transformational perspective. Preliminary results of the analysis will be established and presented.

Contact: Courtenay E. Parlee,
Masters Student, Coastal CURA

Thinking outside the sandbox: Why management strategies for sandy beaches benefit from a plover's eye view

Sue Abbott

Abstract:

Contact: Sue Abbott,
Nova Scotia Projects
Coordinator, Bird Studies Canada

The development of the salmon aquaculture industry in southwestern New Brunswick, Bay of Fundy, 1978 to the present: changes in selected farm parameters and management policies

*B.D. Chang and F.H. Page

Abstract:

A brief history of the development of the salmon farming industry in southwestern New Brunswick (SWNB), Bay of Fundy is presented, including changes in selected farm parameters and management policies.

The industry began with one farm in 1978; there are currently more than 90 approved marine finfish farm leases, covering much of the nearshore area of SWNB. The rapid growth of the industry has led to some conflicts with existing activities, especially commercial fisheries. Over the years, the criteria and management policies regarding site approvals have changed. Initially, sites were approved on a site-by-site basis. In 1991, some small areas were designated where development would be restricted or prohibited due to concerns for the high number of farms within some geographic areas and fisheries concerns. Bay management areas (BMAs) were first implemented in 2000, primarily to address fish health issues on farms. Also in 2000, larger controlled growth and exclusion areas were designated, where no new farm sites would be approved, although expansion of existing farms could be considered. A recent marine planning initiative was begun by the the federal and provincial governments to address the need to resolve marine resource management issues and conflicts within SWNB.

Contact: Blythe Chang, Biologist,
Fisheries and Oceans Canada

Community governance perspectives support social-ecological systems and resilience

*Lisette Wilson and Anthony Charles

Abstract:

This paper assesses local community understanding of social-ecological systems and resilience in the Annapolis Basin, Nova Scotia, with emphasis on community governance perspectives. The study focuses on the Annapolis Basin and River ecosystems and the social networks that interact with these ecological systems. While this interaction occurs through the utilization of ecosystem services, a reciprocal relationship may also exist, manifested in community-based coastal and ocean resource management initiatives that seek to support and enhance the health of the ecosystem. To examine these relationships, ten community based organizations and working groups were surveyed using a semi-formal questionnaire to determine: (1) the type and need for the community based initiative; (2) enabling factors (social, cultural, economic, environment) and organizational factors (including leadership, funding, networking) influencing the initiative's outcome and (3) the community's perceptions of systems resilience through the lens of these initiatives.

The results indicate that the initiatives implemented were largely in response to "external shocks" driven by environmental change, policy or a combination. Social-cultural factors such as community structure-diversity are important for both reducing and creating challenges, whereas the expansion of large corporations was the most influential negative economic factor. Networking and information transfer between community groups and other stakeholders was the most supportive organizational factor. Other variables that positively influenced social resilience included creativeness and diversity; learning during the process, commitment and hope for the future. A key message from this study is that while communities may not fully comprehend the conceptual models of social-ecological systems and resilience, they are still able to describe in their own words important changes to natural and social systems and the influence of enabling and organizational factors on resilience. Through collective community learning, an adaptive governance model may provide a fresh opportunity to strengthen social-ecological resilience in this area.

Contact: Lisette Wilson,
Student, Dalhousie University

Learning to Share: Communication and Information Flow Regarding South West New Brunswick Finfish Aquaculture Industry

*Donna G. Curtis and Maria Recchia

Abstract:

As Canada increasingly adopts co-management approaches to fisheries resources there has been a growing policy emphasis on information and data sharing between resource stakeholders. This paper will demonstrate however, through a case study example, that open communication and information flow between competing resource interest groups although ideal, is a much more complex task than it might first appear.

For almost three years we have been tracking the information flow surrounding issues of finfish aquaculture in the South West New Brunswick region of the Bay of Fundy. We have been building a time-line of communication flow between the Fundy North Fishermen's Association, an NGO representing the interest of local fishermen, various provincial and federal government departments and representatives from the aquaculture industry. Attempts to increase information and communication have been met with both success and failure. The patterns identified in our time-line analysis offers much needed lessons for improving communication and information flow for fisheries co-management.

Contact: Donna Curtis, Student,
University of New Brunswick

Designing Integrated Coastal Zone Programs for Reducing Non-point Source Pollution

Timothy M. Hennessey

Abstract:

The United States amended the Coastal Zone Management Act (Section 6217) in 1990 so as to bring EPA and NOAA together via 15 management measures which were to be implemented by the states to reduce non-point sources of pollution. This process of implementation proved to be exceedingly difficult for the states to accomplish due to costs, political factors and interagency conflict. The program was not fully in place until 2007- a full 17 years after the amendments were expected to go into force.

This paper deals with the factors which hindered successful implementation. One of the major lessons concerns designing mechanisms and tools to get agencies to work together on common problems (i.e. EPA and NOAA). Another lesson concerns the necessity to have political buy -in from the state prior to requiring them to implement a policy as demanding as this one.

Contact: Timothy M. Hennessey,
Department of Marine Affairs,
The University of Rhode Island

The GREEN SHORES Rating and Certification System for Coastal Developments

*Brian Emmett, John Harper, John Readshaw, Harriet Reuggeberg, and Gretchen Harlow

Abstract:

GREEN SHOREStm, a program of the Stewardship Centre of British Columbia, promotes sustainable use of coastal ecosystems through development planning and design that recognizes ecological features and functions (www.greenshores.ca). In 2009 Green Shores released a pilot version of a shore development rating and certification tool modeled after the LEED Green Buildings rating system (Green Shores for Coastal Developments). This rating system has been piloted on four coastal development and shore restoration projects in British Columbia, including South False Creek Olympic Village in Vancouver. This presentation will review the key elements of the rating system as well as the learning outcomes from the pilot projects and provide an update on current Green Shores initiatives, including an assessment framework for single waterfront properties (Green Shores for Homes).

In British Columbia the Green Shores program is increasingly viewed by local governments, community organizations and development professionals as a key resource for sustainable coastal developments. Local governments are often responsible for on-the-ground decisions with respect to shore development in their jurisdictions but lack the skills and resources to make informed decisions. Professionals (developers, engineers, architects, landscape architects) drive development design, but this group rarely includes trained coastal professionals. It is extremely important that coastal management and training efforts provide outreach and tools to these “de facto” coastal practitioners in a format that is readily acceptable and useable in their everyday work environment.

Contacts: Brian Emmett, Archipelago Marine Research Ltd.,

John Harper, Coastal and Oceans Resources Ltd.

John Readshaw, Sandwell Engineering Inc.

Harriet Reuggeberg, HBLanarc Consultants,

Gretchen Harlow, Canadian Wildlife ServiceHarriet

Communication networks for Integrated Management: a case study of the Placentia Bay/Grand Banks Large Ocean Management Area

*Amy Tucker and Ratana Chuenpagdee

Abstract:

Canada has established legislative and policy frameworks for Integrated Management (IM), designed to facilitate the sustainable use of coastal and ocean resources and space. The inclusion of stakeholder groups on the IM planning committees requires that adequate and effective communication takes place among members. We argue that an understanding about how communication functions within and between stakeholder groups is not only critical for successful IM, but can also help locate the limitations and opportunities for improving communication and enhance participation of some stakeholder groups.

Using the Placentia Bay/Grand Banks Large Ocean Management Area (PBGB LOMA) as the study site, we examine the extent to which the LOMA Committee, comprising 26 stakeholder groups, communicates among themselves and with the general public. Details about their communication, including frequency, methods, importance, type, challenges, strategies and channels, are investigated through interviews with group representatives. Following this, social network and qualitative analysis are performed. We find that there is a general lack of communication about the PBGB LOMA initiative, as its purpose and specific roles for members are often unclear. The majority of the stakeholder groups have considerable communications with others, with three being most central and five somewhat marginalized. Within most stakeholder groups there are formal communication channels for discussing the PBGB LOMA; however, in some it is rarely communicated. The importance of communication within and between stakeholder groups is recognized by participants, but its importance with the public varies greatly. Committee members indicate that communication is difficult within such a large area and identify lack of involvement from local groups such as economic development organizations and municipalities as a problem. Stakeholder groups currently do not have a sense of ownership over the PBGB LOMA initiative; however, this needs to occur for there to be effective communication, participation and governance.

Contact: Amy Tucker,
Graduate Student,
Memorial University

Exploring areas of ecological significance along the Atlantic Coast of Nova Scotia for conservation planning

Aimee Gromack¹, Karel Allard², Stan Johnston¹, Derek Fenton², Jen Ford¹

¹Department of Fisheries and Oceans Canada, Maritimes Region, Oceans and Coastal Management Divisions, Bedford Institute of Oceanography

²Canadian Wildlife Service, Environment Canada

Abstract:

Coastal zones worldwide are facing threats of anthropogenic pressures that compromise the ecological integrity of our fragile coastal ecosystems, consequently impacting the well-being of coastal communities. However, there is opportunity to implement effective protection and management of our coastal ecosystems to prevent future impacts and to maintain or even enhance our remaining healthy coastal ecosystems. Marine Protected Areas (MPAs) are one of several management tools which can be used to ensure the protection of natural and cultural resources in the coastal zone. Nova Scotia is a province almost entirely surrounded by ocean and is one of two coastal provinces without substantial marine protection.

The Department of Fisheries and Oceans, Maritimes Region is developing a report to assist with future efforts for conservation planning along the Atlantic coast of Nova Scotia, in collaboration with some provincial departments in the Nova Scotia government. This information will help form the basis for a more systematic approach to conservation planning along the Atlantic coast of Nova Scotia, including the identification of a coastal conservation areas network that may include federal MPAs, provincial protected areas, and other management tools. A Canadian Technical Report of Fisheries and Aquatic Sciences entitled, "*Identification of Ecologically Significant Areas for Conservation Planning on the Atlantic Coast of Nova Scotia: Ecological and Human Use Information*" describes this initiative in detail. Elements of the report will be presented including: the methodology by which the twenty areas were identified, ecological and human use information on one of the twenty sites, an overview of the data and information gaps, and the next steps for coastal conservation along the Atlantic coast of Nova Scotia.

Contact: Aimee Gromack,
Oceans Biologist, Marine Protected
Area Planning, Fisheries and Oceans Canada

Analysis of the short and long-term processes involved in coastline erosion

*N. Crowell, T. Webster, and S. Bondrup-Nielsen

Abstract:

Coastline erosion is of particular interest to policy makers, land planners, and inhabitants of any coastal community. The processes of erosion must be well understood in order to minimize risk to infrastructure and maintain sustainable habitats. Analysis focused on long and short term aspects of coastal erosion observed across the highly diverse coastline of Antigonish, Nova Scotia. The research addressed two major objectives: A) to develop a coastal erosion risk map which highlighted areas predicted to be prone to erosion based on historical observations and B) to obtain high precision measurements of glacial till banks susceptible to erosion by seasonal storm surges using a ground based light detection and ranging (LiDAR) system.

A broad analysis of long-term coastline change focused on average rates of erosion between 1939 and 2008. Historical changes were assessed by delineating coastline vectors based on orthorectified aerial photography (n=257) which spanned the length of the Antigonish coastline. Delineated coastline vectors will ultimately be used to quantify the average rates of scarp retreat and accumulation between temporally spaced aerial surveys which are predicated to range widely due to variable composition of bedrock and surficial geology throughout the coastal area. Local relief was measured using an airborne LiDAR system.

The survey will provide useful information regarding slope, vegetation densities, and drainage characteristics throughout the coastal zone. Detailed analysis of short-term till bank erosion focused on an eroding drumlin in the Dunns Beach area. A ground based LiDAR survey was conducted along a 200 m span of a drumlin in the fall of 2009. The survey achieved an average point spacing of 1 cm and will serve as a baseline for future change detection. Subsequent scans are planned for the spring of 2010. The analysis is anticipated to provide insight into the processes involved in erosion of the drumlin.

Contact: Nathan Crowell,
Research Student,
Applied Geomatics Research Group

A temporal and spatial assessment of persistent marine debris accumulation seaward of the Cardiff Bay Barrage, South Wales, UK

*Michael Phillips and Kathryn Tate

Abstract:

An investigation into persistent marine debris adjacent to the Cardiff Bay Barrage, South Wales, UK, was carried out to assess whether the barrage construction had affected litter accumulation, as well as investigating other influencing factors.

Litter data collected between 1997 and 2005 was compared with other variable data, including regional rainfall and mean beach level. Plastic debris was the dominant material collected for all surveys (average 56.2%), which is comparable with results from other UK beach studies. Metal drink cans were found in unusually large quantities and overall, glass and paper quantities were low in comparison to plastics and metal. Containers were the dominant category and this was linked to increases in the packaging industry. Although no specific source was identified, an 89% correlation between rainfall and amount of litter m⁻¹ over the survey area indicated a riverine source. Other sources indicated were sewage related, beach users, recreational vessels and fishing. Statistical analysis showed no significant difference between overall beach litter found at the start and end of the survey period.

However, analysis suggested that the breakwater had completely altered the pattern of litter accumulation adjacent to the barrage, and this influence decreased with distance. Mean beach level data from 1997 was compared to the corresponding number of litter items m⁻¹, giving a positive correlation of 72%, and average 2005 litter items m⁻¹ gave a positive correlation of 65%. Beach levels were found to influence litter accumulation; greater beach face volumes correlated with higher litter accumulations. However, beach gradient did not appear to influence results. The quantity of litter accumulating at the back beach position was twice that accumulating at the lower strandlines. It was concluded that litter behaved in a similar manner to other beach sediments.

Contact: Michael Phillips,
Head of Department,
Swansea Metropolitan University

Management planning for Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site

Norm A. Sloan

Abstract:

The signing of the *Gwaii Haanas Marine Agreement* in January, 2010 between Canada and the Haida Nation was the tipping point for the original commitment made in 1988 to create a marine conservation area off southern Haida Gwaii (Queen Charlotte Islands). Management of Gwaii Haanas will be innovative. Firstly, Gwaii Haanas is unique in being cooperatively managed between Canada and an indigenous group (the Haida Nation) as an integrated land and sea conservation area. Secondly, it is the first National Marine Conservation Area (NMCA) created by Parks Canada Agency as mandated under the *Canada NMCA Act* of 2002. Thirdly, it is the first area for which Parks Canada and Fisheries and Oceans Canada will partner to represent Canada to action cooperative management with a First Nation for area management. An interim management plan (IMP) has been submitted to Parliament as part of the mandatory documentation supporting permanent establishment under legislation. The management cooperative will have five years post-establishment to complete a formal management plan. The IMP's guiding principles and management objectives guiding the NMCA's early years are discussed.

Contact: Norm A. Sloan, Gwaii Haanas
National Marine Conservation Area
Reserve and Haida Heritage Site, Parks Canada

West Point, PEI - Coastal morphology and the implications of sand mining

*Davies, M.H. and Raymond, B.

Abstract:

This paper presents the findings of a study undertaken to evaluate shore processes and coastal morphology at West Point, PEI. This work, undertaken under contract to the Prince Edward Island Department of Environment, Energy and Forestry documents the dramatic changes that have occurred along the shoreline over the past century. A fifty year hindcast of offshore wave and ice conditions was used to compute decadal fluctuations in longshore sand transport. A regional sediment budget was established and used to evaluate the effects of local sand mining operations.

This paper demonstrates the usefulness of tools such as sediment budgeting for shoreline management. Results of this analysis showed conclusively that sand mining operations have directly resulted in large-scale shore erosion. Findings of this study contributed directly to the province's recent decision to revoke the Sand Removal from Beaches Regulations under the Environmental Protection Act.

Contact: Michael Davies,
President,
Coldwater Consulting Ltd.

Mapping of eelgrass (*Zostera marina*) landscapes; data for a spatially complex mosaic

Jeffrey Barrell

Abstract:

Eelgrass (*Zostera marina*) is an important component of coastal areas in Atlantic Canada, offering valuable ecosystem services to both natural and human communities. The presence of eelgrass provides habitat and substrate for biological communities, and helps to regulate physical and chemical conditions wherever it grows. Eelgrass habitat is also sensitive to changes in environmental conditions, leading to interest in its use as an indicator of coastal ecosystem health. As eelgrass is affected by forces varying over a range of spatial scales, it is important to understand the spatial dynamics of the eelgrass-environment relationship to assist with ecosystem assessment, monitoring, and the identification of priority conservation areas.

The current work investigates eelgrass habitat in a spatial context using principles and techniques from landscape ecology, geostatistics, remote sensing, and Geographic Information Systems (GIS). Spatial data representing eelgrass distribution are drawn from a high frequency single-beam sonar unit and from a helium blimp-based aerial photography platform. Each method offers a data type from which spatial information can be displayed and extracted. The data can then be processed using a variety of geospatial techniques depending on what end-user content is desired. Mapping and data processing techniques will be discussed, with the goal of providing spatially explicit eelgrass distribution data to habitat managers, scientists, and other interested parties.

Contact: Jeffrey Barrell,
 Dalhousie University

Commercial fisheries closures in Marine Protected Areas on Canada's Pacific Coast: the exception not the rule

*Carrie Robb, Karin Bodtker, Kim Wright, and Jennifer Lash

Abstract:

No-take Marine Protected Areas (MPAs), where all fishing is prohibited, are shown to provide benefits that include greater productivity of fish stocks due to increased densities, average sizes, and reproductive output. On the Pacific Coast of Canada in 2008, 161 MPAs had been designated by federal, provincial or municipal authorities. The objective of this study was to identify the number of these MPAs in which habitats and species are protected from commercial fishing.

We built a comprehensive spatial dataset illustrating commercial fisheries closures and overlaid this with a MPA dataset in a GIS. Results show that 160 of the 161 MPAs are open to some commercial harvesting within their bounds. One small municipal MPA and portions of three other MPAs are not open to commercial harvesting. We also examined the IUCN protected area categorization for each MPA and found the majority designated as IUCN Strict Nature Reserve (Type Ia), Wilderness Area (Type Ib), and National Park (Type II) marine reserves, which are intended to be free from exploitation. The incongruence between management intent and fisheries permitted suggests a management failure between designation of MPAs and implementation of fisheries management regulations.

Our recommendations include better coordination between the management of fisheries and the management of protected areas in Canada's Pacific Waters. Our analysis and recommendations are timely as Canada has made an international commitment as a signatory to the Convention on Biological Diversity to build a network of MPAs by 2012, in which at least 10% of each ecological region will be effectively conserved.

Contact: Carrie Robb,
Geographic Information Systems
(GIS) Specialist, Living Oceans Society

Coastal Erosion and Climate Change/Variability Impacts in Pacific Rim National Park Reserve

*Hawley E. R. Beaugrand & Ian J. Walker

Abstract:

To date, there has been little research on the morphodynamics of Canada's Pacific mesotidal beach-dune systems and their potential response to climate variability and change. Accordingly, this study examines and characterizes the morphodynamics of a mesotidal beach-dune system on Western Vancouver Island (Wickaninnish Beach) and investigates its potential response to extreme seasonal storms, climate variability events, and climate change trends. Research methods include repeat cross-sectional and full topographic surveys, repeat vantage photographs, airphoto analysis, and analysis of the wind, wave, and water level regime.

Initial survey results are informative only of seasonal changes. Longer-term monitoring will better reveal contemporary erosional/depositional trends of the beach-dune system. Airphoto analyses show Wickaninnish Beach has prograded at a rate of 0.2 m a⁻¹ from 1973-2007 and dune sand surface extent was reduced by 27.8%. Progradation can be attributed to a fall in relative sea level caused by regional tectonic uplift and a high dune rebuilding potential (aeolian sand transport potential = 9978.54 m³m⁻¹a⁻¹, resultant aeolian sand transport = 3230.55 m³m⁻¹a⁻¹ at 356 degrees). Loss of the dune sand surface is indicative of dune stabilization by native and invasive vegetation (e.g., *Ammophila arenaria*) likely due to recent increasing air temperatures and precipitation trends associated with climate change.

A threshold elevation for dune erosion was defined at 5.55 m aCD. Erosive water levels are reached, on average, two times per year. Statistical relations show average monthly observed water levels are significantly correlated to the Pacific Decadal Oscillation (PDO), the Northern Oscillation Index (NOI), and the Multivariate El Niño Southern Oscillation (ENSO) Index (MEI), and the monthly maximum observed water levels are significantly correlated to NOI and MEI. The strongest correlation ($r = -0.346$) is between the mean monthly observed water levels and NOI. This suggests climate variability signals are manifest in regional erosional water level regimes.

Contact: Hawley Beaugrand,
University of Victoria

Challenges of Successful Integrated Coastal Zoning: Lessons from the Southern Part of the Gulf of Thailand

*Suvaluck Satumanatpan, Pisase Senawongse, Oranuch Silpamaneephan and Phansa Chomchit

Abstract:

The concepts of coastal and marine special planning have been practiced in Thailand since 1992. Focusing on coastal zoning, Thailand has a variety of systems in place including that in mangrove areas, coral reefs, fisheries, national marine parks, and coastal environmental protected zones. Up to present, six coastal environmental protected zones have been announced by the Thai government. This paper presents an assessment of the measures at one coastal environmental protected zone in the southern part of the Gulf of Thailand covering the two provinces of Phetchaburi and Prachuap Khiri Khan by means of participation of related stakeholders. Results indicate that progress is being made towards meeting stated output objectives at the medium effectiveness level.

The objectives are: 1) controlling activities which cause coastal erosion; 2) controlling activities which cause pollution to coastal areas; and 3) controlling activities for the preservation and conservation of natural resources and the environment. Although the majority of the stated output objectives were achieved, severe coastal erosion, and surface water and coastal water pollution still exist in many places. This paper recognizes that monitoring, evaluation, and adaptive management techniques are fundamental components of effective coastal and marine management. In addition, this paper suggests that a good governance system is also vital and a key feature of successful integrated coastal management allowing for a high level of environmental protection alongside and a wide range of human activities.

Contact: Suvaluck Satumanatpan,
Associate Professor, Mahidol University

Basin Head Post Marine Protected Area Designation: Monitoring and Management

Venitia Joseph, Mireille Chiasson, Delly Keen, Glyn Sharp, Andrea Locke and Herb Vandermeulen, , Fisheries and Oceans Canada

Presenter: Ray MacIsaac, Fisheries and Oceans Canada

Abstract:

Monitoring and management in the Basin Head Marine Protected Area (MPA) was established in October 2005 under the Oceans Act. The objective of the MPA designation is to protect and conserve a distinct form of Irish moss (*Chondrus crispus*) and its habitat found in Basin Head, Prince Edward Island. This form does not have a holdfast and is held on the bottom by the byssal threads of blue mussel, is significantly broader than the normal type of Irish moss, reproduces almost exclusively through asexual fragmentation, and is located primarily in the northeast arm of the Basin.

As early as 2005, monitoring in Basin Head indicated a change in abundance and condition for this distinctive seaweed. By November 2007, the area of the *Chondrus* bed had declined from 0.65 hectares in 2005 to 0.2 hectares in 2007. The biomass had declined from 11.7 tons to 1.0 tons. Due to the dramatic decline, seed stock was preserved at the National Research Council seaweed cultivation facility at Sandy Cove, Nova Scotia for both restocking the basin when needed and for out planting experiments. In 2008, Science Advice was sought to review the status of Irish moss in Basin Head, and to identify potential factors contributing to the reported declines. Two potential causes were identified for the decline: 1) nutrient enrichment causing poor water and excessive algal blooms and 2) the presence of green crab which is a predator of the mussels that anchor the moss. In addition to the routine monitoring of water quality and Irish moss abundance, a green crab control pilot program was put in place in 2009. As well a watershed management plan has been developed and is ready to be implemented to address nutrient and other land-based issues. The results of the monitoring program and management actions are presented.

Contact: Venitia Joseph
Oceans and Science Branch
Fisheries and Oceans Canada, Gulf Region

Geomorphology, Sedimentology, and Management Issues, Hog Island (Pemamgiag) Sandhills, PEI

*Norm Catto and Gail Catto

Abstract:

The Hog Island Sandhills barrier island and dune complex, north coast, PEI, is one of the least disturbed coastal dune complexes in Atlantic Canada. The Sandhills, including four segments of dune-backed coast, encompasses 1496 ha, extending linearly for 113 km. The complex consists of transverse, parabolic, shield, and dome dunes. Smaller features superimposed on larger ones indicate both multiple periods of dune development and irregular reworking and redeposition of sand on dune surfaces. Internal structures indicate deposition by grain avalanching, viscous grainflow, and kinetic sieving. Erosional scoured surfaces containing adhesion ripples, adhesion warts, rain pit structures, and niveo-aeolian features are common. Crestal platforms, formed where periodic snow cover allows sand grains to adhere to the surface, are evident on transverse dunes.

Ongoing deflation of the dune complex is indicated by blowouts. Saucer blowouts are dominant in areas not subject to intensive human disturbance. Trough blowouts, indicative of human disturbance, range from 0.5 m to 4 m in depth. Large trough deflation hollows are present, with depths locally exceeding 11 m. The extent, style, and duration of human activity are significant influences on the rate and style of deflation. Anthropogenic pressure is the primary influence controlling the observed change from saucer to trough development, and the enhanced deflation evident in the trough blowouts and deflation hollows.

Comparison of the relatively undisturbed Hog Island Sandhills complex with other more disturbed dune-backed coastal areas of PEI indicates that the terrain has retained most of its natural landscape. However, signs of disturbance are evident along both the Gulf of St. Lawrence and Malpeque Bay coastlines. Increased tourism without appropriate forethought will result in significant damage to the Hog Island Sandhills from erosion of the dune complex, particularly the development of trough blowouts and deflation hollows, increased erosion, and substantial alteration of the dune landscape.

Contact: Norm Catto,
Professor,
Memorial University

Aboriginal oral knowledge

Hugh Akagi

Abstract:

This is a poster display meant to explain the pitfalls of Aboriginal Traditional Knowledge (ATK), Traditional Ecological Knowledge (TEK), Traditional Knowledge Systems (TKS), etc. while maintaining the need to preserve “ORAL” knowledge using “ORAL” tradition. The display will bridge the gap between the worlds using both traditional and modern elements.

The poster is also meant to compliment the BoFEP presentation: Linking Cultures to Protect Mother Earth.

Contact: Hugh Akagi, Board Member,
Bay of Fundy Ecosystem Partnership (BoFEP)

Assessment of Scenic Preferences and Aesthetic Resources in Washington State Coastal Parks Using Internet-Based Geospatial Techniques

*Anthony O. Gabriel and David S. Cordner

Abstract:

Shoreline management is often required to consider aesthetic values as part of decision-making processes, which has resulted in various efforts to identify and quantify visual attributes of landscapes. These have included various component-based field survey methods, visual preference surveys based on photography and field visits, as well as GIS analysis. This project developed a methodology for assessing aesthetic resources for parks along marine shorelines. First, an internet-based, scenic preference survey instrument was developed that combines digital aerial photographs, maps, and panoramic photographs to gather spatially referenced data concerning shoreline aesthetic resources from stakeholders via a web-based, Likert scale questionnaire. The interactive map, using OpenLayers, allows users to visit representative coastal views as a tourist, as well as spatially locate and evaluate scenic amenities in a 360 degree panoramic view, taken at the shore's edge and divided into four equal segments, each representing waterward, shoreward or alongshore views. The results of the survey may be used to rank-order view directions, locations, and parks on the basis of scenic preference. Survey results may also be statistically compared to measurements of the type and extent of physical landscape components evident in each 90 degree portion of the panoramic view.

The methodology includes geospatial techniques to analyze the results of the scenic preference survey in conjunction with physical, biological, and cultural information obtained from existing GIS databases. Using a 10 meter resolution digital elevation model that integrated top surface LIDAR data, viewsheds were constructed in ArcGIS for 40 locations, which were further divided into quadrants corresponding to the 90 degree portions of the panoramic views evaluated through the scenic preference survey. These quadrants were then geospatially analyzed to identify and quantify the landscape characteristics of each view, including geomorphic types and conditions, vegetation cover, habitat information, shoreline alterations, land use, and distance of vista.

Contact: Anthony Gabriel, Professor,
Center for Spatial Information,
Department of Geography – Central Washington University

Basin Head Post Marine Protected Area Designation: Monitoring and Management

Venitia Joseph, Mireille Chiasson, Delly Keen, Glyn Sharp, Andrea Locke and Herb Vandermeulen, Fisheries and Oceans Canada

Presenters: Marie-Hélène Thériault and Julie Whalen, Fisheries and Oceans Canada

Abstract:

Monitoring and management in the Basin Head Marine Protected Area (MPA) was established in October 2005 under the Oceans Act. The objective of the MPA designation is to protect and conserve a distinct form of Irish moss (*Chondrus crispus*) and its habitat found in Basin Head, Prince Edward Island. This form does not have a holdfast and is held on the bottom by the byssal threads of blue mussel, is significantly broader than the normal type of Irish moss, reproduces almost exclusively through asexual fragmentation, and is located primarily in the northeast arm of the Basin.

As early as 2005, monitoring in Basin Head indicated a change in abundance and condition for this distinctive seaweed. By November 2007, the area of the *Chondrus* bed had declined from 0.65 hectares in 2005 to 0.2 hectares in 2007. The biomass had declined from 11.7 tons to 1.0 tons. Due to the dramatic decline, seed stock was preserved at the National Research Council seaweed cultivation facility at Sandy Cove, Nova Scotia for both restocking the basin when needed and for out planting experiments. In 2008, Science Advice was sought to review the status of Irish moss in Basin Head, and to identify potential factors contributing to the reported declines. Two potential causes were identified for the decline: 1) nutrient enrichment causing poor water and excessive algal blooms and 2) the presence of green crab which is a predator of the mussels that anchor the moss. In addition to the routine monitoring of water quality and Irish moss abundance, a green crab control pilot program was put in place in 2009. As well a watershed management plan has been developed and is ready to be implemented to address nutrient and other land-based issues. The results of the monitoring program and management actions are presented.

Contact: Venitia Joseph
Oceans and Science Branch
Fisheries and Oceans Canada, Gulf Region

Ecosystem Indicators and Tools in the Gulf of Maine

*Christine M. Tilburg, Susan Russell-Robinson and Kathryn Parlee

Abstract:

The Gulf of Maine Council on the Marine Environment (GOMC) is a U.S.-Canadian partnership of government and nongovernment organizations focused on the health, environmental quality and productivity of the Gulf of Maine. In 2006, the GOMC identified priority indicators to monitor ecosystem health in the Gulf of Maine, including the Bay of Fundy. The Ecosystem Indicator Partnership (ESIP) led activities in six indicator theme areas (coastal development, climate change, contaminants, eutrophication, aquatic habitats, and fisheries and aquaculture). Subcommittees were established for each theme area, and currently more than 100 volunteers from local, state and federal governments, along with academics and partners from non-government organizations participate in one or more of these subcommittees. Following a consensus-based process, the subcommittees selected priority indicators for each of the theme areas.

As local and global efforts to minimize the impacts of climate change and non-point pollution increase, it is critical that managers know and understand current conditions. ESIP, with support from Environment Canada, Fisheries and Ocean Canada, U.S. Geological Survey, and U.S. Environmental Protection Agency, has moved ahead with status and trends analysis for two sets of the indicators: eutrophication and climate change. A wealth of data has been collected from around the Gulf. Both nitrogen loading and dissolved oxygen show marked differences from area to area. These local variations might require managers to be aware of specific local nitrogen and phosphorus inputs. On the other hand, the recent work on air temperature, sea level rise, and precipitation show general trends are similar throughout the region in terms of increasing air temperature, sea level, and extremes in precipitation. The ability to compare and contrast Gulf of Maine priority indicators will enable local managers to make choices on action based upon sound science.

Contact: Christine Tilburg,
Program Manager,
Gulf of Maine Council

From science to policy making: investigating the use and influence of marine environmental grey literature

Bertrum H. MacDonald,¹ Peter G. Wells,² *Suzette S. Soomai,³
Danielle M. Cossarini,¹ Ruth E. Cordes,⁴ and Gregory R.G. Hutton¹

¹ *School of Information Management, Dalhousie University*

² *School for Resource and Environmental Studies and Marine Affairs Program, Dalhousie University*

³ *Marine Affairs Program, Dalhousie University*

⁴ *Independent Information Consultant,*

Abstract:

Publication of grey literature has grown extensively because it is readily facilitated by widely accessible digital technologies. Annually, thousands of publications are generated worldwide often as grey literature. However, distribution and access to these publications can be problematic, even in the presence of open access systems, the Internet, and powerful search engines. Are the extensive resources (upwards of \$1 million per title) devoted to the production of such publications justified? This question is particularly significant in environmental contexts where decisions affecting the fate and future of terrestrial and marine-based ecosystems could and should be informed by currently available scientific information.

This poster outlines the framework and objectives of a research initiative being pursued by the authors. Using major case studies of governmental and intergovernmental organizations focused on marine environmental protection, the initiative is investigating several questions including: what is the influence of scientific grey literature? In policy decision-making contexts are research reports published as grey literature perceived differently than research published as papers in scientific journals (even when grey literature may undergo similar quality checks as journal papers)? And, how should information and publications be designed for effective discovery and ultimately for impact?

Through use of a suite of research methodologies (citation analysis, content analysis of public policy documents, interviews of key informants in public sector management, and surveys), a comprehensive understanding of information and knowledge diffusion and use in public sector settings is being developed. This research is of importance to many environmental organizations that communicate with audiences through grey literature.

Contacts: Bertrum H MacDonald, School of
Information Management, Dalhousie University

Peter G. Wells, School for Resource and Environmental Studies
and Marine Affairs Program, Dalhousie University

Habitat models for species at risk in the Bay of Fundy

*Martha Baldwin and Jon Grant

Abstract:

Under the Species at Risk Act, DFO has responsibilities for protection and recovery of populations at risk. The use of GIS models for the identification of critical habitat and essential ecogeographical variables is an important tool in species and habitat at risk protection. A joint research program between DFO and Dalhousie University seeks to determine the best approach to habitat modeling. GIS and remote sensing provide a cost-effective approach to these tasks, with the added benefit of addressing the ecosystem scale.

The Bay of Fundy is a zone of particular interest due to the presence of a variety of species at risk and its characteristic conditions of large tidal ranges and steep turbidity gradient. The inner Bay of Fundy salmon constitute a unique genetic subgroup of Atlantic salmon, spending their time at sea confined within the Bay of Fundy. Their spawning is tied to several dozen rivers within the bay; rivers, which are of increasing interest since COSEWIC gave iBoF salmon endangered status in 2001. The population seems to be declining due to a combination of mortality at sea and habitat conditions in the natal rivers. A systematic comparison of these rivers is an essential step to clarifying river attributes important to salmon at various life cycle stages, the determination of rivers or watersheds requiring further habitat protection, and the rivers or watersheds that would benefit most from restoration.

With the aide of GIS tools we produce a variety of variables, which characterize each river and relate them to adjacent salmon at sea, returns and densities recorded within the river. Assembling this data and information in a quantitative way is an approach that has great potential for expanding understanding at an ecosystem level of the endangered iBoF salmon.

Contact: Martha Baldwin,
Dalhousie University

Identifying priority marine conservation areas on the US west coast using MARXAN

*Joanna Smith, Richard Vander Schaaf, Dan Kelly and Ken Popper

Abstract:

The conservation of marine species and habitats is important for ecosystem function, long-term resilience to oceanic and climate change, and sustainable coastal communities.

On the west coast of North America, continental shelf and slope habitats are productive, rich ecosystems and prioritising areas for the long-term conservation of biodiversity is increasingly relevant for marine spatial planning and resource management. We conducted a spatially-explicit analysis for marine species and habitats over a 97,925 km² ecoregion in the California Current System, from Cape Mendocino, CA to Cape Flattery, WA, from the estuaries to the toe of the continental slope. We used an optimization site-selection algorithm, MARXAN, to empirically derive a solution set for 30 to 50% conservation goals with the fewest anthropogenic conflicts at an ecoregional scale.

Data in this analysis included benthic habitat, deep water canyons, kelp beds, estuaries, seabirds, marine mammals, corals, sponges, commercial groundfish species, and sea surface temperature and chlorophyll to capture dynamic oceanographic processes. The cost data included commercial ports, fisheries logbook information, and protected areas. Our results identify high biodiversity areas on the continental shelf and slope in numerous locations, and prioritise opportunities to address marine conservation across the northern portion of the California Current Ecosystem.

Contact: Joanna Smith,
Marine ecologist,
The Nature Conservancy

Impacts of Climate Change on Coastal Communities and Mangrove Ecosystems: Local Vulnerabilities and Local Perceptions

*Tiffanie Rainville and Tony Charles

Abstract:

Coastal communities in developing countries face a variety of stressors from both inland and marine sources, many of which will be exacerbated by climate change. Though global scientific predictions aid in characterizing vulnerabilities at global and national scales, there is a lack of awareness of how impacts have been and will be felt at the local level due to the significant regional differences that exist in terms of geological, social, oceanographic and biological processes. To contribute to the literature on these local implications, this study examined the mangrove ecosystems and coastal zones in two communities in Ecuador: Muisne, Esmeraldas and Portovelo, Manabí. Semi-structured interviews and participatory community 'green mapping' were conducted to glean information about the biophysical changes witnessed in the coastal zone and surrounding estuaries, based on local ecological knowledge as well as the local perceptions of climate change.

Results were compared with information from local organizations, national experts, government and global scientific data (ex. IPCC reports) in order to identify important knowledge gaps and key vulnerabilities. The study also assessed the role of mangrove forests in reducing vulnerabilities and as an adaptation tool at the local level. Preliminary results indicate that negative impacts seen in freshwater quality and availability, in mangrove health and the livelihoods of subsistence fishermen are of concern locally.

However, these changes are attributed to causes other than climate change, as both communities have been severely affected by the shrimp farm industry as well as the El Niño Phenomenon (1997-1998). While the communities have witnessed a variety of climatic changes in the area ranging from rainfall variability to sea level rise, it appears that climate change and its associated vocabulary are not yet fully understood at the local level.

Contact: Tiffanie Rainville,
Graduate Student,
Dalhousie University

Macro- and meso-tidal wetland restoration in Canada's Maritime Provinces

*N. Neatt, T. Bowron, D. Van Proosdij, J. Lundholm, J. Graham and R. Pett

Abstract:

In Canada's Maritime Provinces (Nova Scotia, New Brunswick, Prince Edward Island) salt marsh restoration is in its infancy. Salt marsh restoration projects in the Maritime Provinces have mostly been opportunistic in nature, or required by legislation (reactive, rather than proactive). Restoration projects have been undertaken in all three Maritime Provinces, with the majority of projects having occurred in the Bay of Fundy, the area of greatest historical loss. The unique hydrological and sediment conditions experienced in the Bay, combined with the historical significance of these marshes (dikelands), the severity of habitat loss (80%), the importance for migratory and endangered species, and its importance as a significant component of the Gulf of Maine ecosystem have served to focus restoration efforts on these marshes. Projects with the primary goal of restoring salt marsh have only been undertaken since 2005, and of those projects, few have involved long-term comprehensive monitoring programs. For most of these projects, restoration efforts (earthworks) have focused on the reduction or elimination of the primary restriction to hydrology (dike or causeway) and have relied on natural processes to restore the natural salt marsh flora and fauna to project sites.

This poster will highlight the research activities, partnerships, and legislative measures leading to the success of these projects. The focus will be on the six tidal wetland restoration (compensation) projects that are using the GPAC Regional Monitoring Program to monitor hydrology, soils & sediment, vegetation, fish and invertebrates. The results from the pre- and first three years of post-restoration monitoring for the Walton River project will be looked at to illustrate some of the lessons learned regarding the ecological condition of Bay of Fundy salt marshes and the response to restoration efforts.

Contacts: Nancy Neatt, CB Wetlands
& Environmental Specialists

Tony Bowron, CB Wetlands
& Environmental Specialists

A preliminary analysis of information needs of coastal and ocean managers

*Jennifer Weldon, Samantha Dutka and Elaine G. Toms

Abstract:

Managing coastal areas means balancing a host of competing interests that need to enable sustainable growth, while protecting human welfare and environmental health. To direct this process, environmental managers must digest a large amount of data and information to make the inevitable complex decisions. The challenge is the lack of adequate tools to facilitate the examination and assessment of an overwhelming and increasing amount of information in multiple domains. The objective of this research which is the initial step in a long term project is to understand how environmental managers in coastal and ocean areas use information to make decisions.

Interviews with these managers are being conducted using the critical incident technique, which focuses on tasks performed, the steps taken to accomplish each task, what sources of information are currently used or needed, and the challenges involved in finding relevant information. The outcome from this phase will be a series of use cases, a taxonomy of tasks performed by environmental managers, and the requisite information used to enable both.

The results will form the basis of a set of requirements that will drive the development of novel tools to facilitate coastal and oceans decision making. This is part of the next Generation Information Appliance (nGAIA) project funded by the Networks of Centres of Excellence (NCE) GRAND project.

Contact: Jennifer Weldon,
Graduate Student, Faculty
of Management, Dalhousie University

Quantification of Coastal Erosion and Rock Cliff Recession: photogrammetric analysis and environmental monitoring, Acadian Peninsula, New Brunswick

*Julie Patry-Herard and Daniel Germain

Abstract:

Sea-level rise is one of the biggest concerns associated with climate change. Because of a number of factors including local vertical land movements, regional differences in sea-levels may occur through the southern Gulf of St. Lawrence. In the north-eastern area of New Brunswick, where the land is sinking and the sea-level rose by 0.3 m in the last 100 years, the most important consequence of climate change is an acceleration of coastal erosion rates. Indeed, during the last decade, some coastal communities have already been facing various flooding and erosion problems.

In order to develop an evolutionary model of shoreline retreat along the cliffed coast, and investigate the relationship of the retreat pattern and climate change, we started recently an historical analysis of shoreline change and rock cliff retreat along the Acadian Peninsula coast by using digital photogrammetry and environmental monitoring (rock temperature and humidity). Wave-induced undercutting of the vertical cliff face is usually assumed to play a major role in cliff retreat rates, but our short-term observations suggest a synergistic influence of local (rock and joint parameters, ground water level) and regional (freeze-thaw cycles) factors. The hydrodynamics parameters appear of second importance after weathering, because sea ice limits wave development during winter. However, the declining trend for ice cover in the region coupled with a rising sea-level may contribute to increase rock cliff retreat in the near future.

Contact: Julie Patry-Herard,
Master Student,
Universite du Quebec a Montreal

Towards participatory governance in the fish marketing system: Canada and the Caribbean

Sarita Williams-Peter

Abstract:

The reduction of fisher poverty through the intervention of governments in the fish marketing system has been at the core of fisheries development and management plans in many countries. Over the past decade there has been an increased movement by governments towards participatory governance as a means of controlling complex social and economic problems. Participatory governance in the fisheries literature has been primarily focused on the co-management of fisheries resources for the purpose of conservation and sustainable use. This research assesses the state-influenced institutional mechanisms for the participation of fishers in the governance system of fish markets with attention to four different countries, Canada, Belize, Grenada and Saint Lucia.

The policy environment and organisational provisions for participatory governance at the macro, meso and micro level of fish marketing institutions will be examined. The data and information will be collected through the review of secondary literature and interviews with representatives of the institutions involved in the market system. The data and information will be analysed based on indicators that reflect participatory governance: transparency, accountability and meaningful participation. Insights drawn from the case studies could provide the state-influenced marketing institutions with best practices for participatory governance in the fish marketing system.

Additionally, the study is expected to highlight gaps in capacity and capability of state institutions to provide a participatory governance environment that promotes fisher participation in fish marketing. Furthermore, one of the principal goals of the Principal Ocean Governance Networks (PROGOVNET) is to develop and implement mechanisms in support of ocean governance. Therefore, the lessons learnt from this project can potentially be transferred to the Caribbean region to strengthen current initiatives to enhance the institutional capacity of fisher folk organisations and to sustainably expand fish markets.

Contact: Sarita Williams-Peter
Masters of Marine Management Candidate
Marine Affairs Program, Dalhousie University

Maine's working waterfront access pilot program

Hugh Cowperthwaite

Abstract:

Waterfront access for Maine's commercial fishermen is a pressing issue. Property values, property taxes and the rising costs of doing business on the coast are contributing to the conversion of commercial fishing properties for residential use. This has resulted in reduced water access for commercial entities along the coast. As these businesses continue to face the unprecedented pressures of rising fuel and bait costs, and low boat prices the current economic conditions continue to tempt commercial waterfront businesses to sell their property.

In an effort to reverse this trend, in 2005 Maine designed and created what has now become a \$5M Working Waterfront Access Pilot Program (WWAPP). The program was designed to invest in "economically significant" working waterfront access projects along Maine's coast by awarding applicants a cash grant through a competitive application process. All projects are scored against 5 core program criteria which consider the 1) economic significance, 2) availability of alternative properties, 3) community support, 4) threat of conversion to another use 5) the overall utility of the property. Each project requires a 1:1 dollar match and the applicant must agree to enter a "working waterfront covenant" with the state. The covenant is written specific to each property and essentially strips the future development rights from the property to assure that it will remain in commercial fishing use in perpetuity, the covenant also gives the state of Maine a right of first refusal if the property is ever to be sold.

CEI has been administering the WWAPP program since its inception on behalf of the state of Maine. The goal of the presentation will be to share with our Canadian neighbors and interested parties the experiences, challenges and lessons learned that Maine has had over the last 4 years with developing this "first of a kind program".

Contact: Hugh Cowperthwaite,
Fisheries Project Director,
Coastal Enterprises Inc.

Institutional Dimensions and Environmental Justice Implications of Maritime Spatial Planning

Elizabeth M. De Santo

Abstract:

This paper examines the developing framework for Maritime Spatial Planning (MSP) in the European Community (EC), in particular vertical and horizontal interactions between new and existing legislative components and ramifications for social environmental justice. The new Integrated Maritime Policy and Marine Strategy Framework Directive build on the existing Habitats Directive and Common Fisheries Policy, with an overarching goal to develop MSP in European marine waters. Given the bifurcation between nature conservation and fisheries management in the EC, with Member States responsible for the former whilst the Commission holds exclusive competence for the latter, achieving conservation objectives in areas at risk from fishing activities poses significant challenges.

An “ecosystem-based approach” to marine management is enshrined in the Integrated Maritime Policy and Marine Strategy Framework Directive and forms the basis of MSP. This concept is intended to encompass all aspects of an ecosystem, including the human element. Yet the modes of including meaningful public participation in the decision-making process for MSP remain undetermined. At the same time, the Aarhus Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters provides a role for non-governmental organizations to engage in MSP initiatives, on both regional and international levels.

This paper examines the European case and draws insights relevant to the application of MSP approaches in Canada.

Contact: Elizabeth De Santo,
Assistant Professor,
Dalhousie University Marine Affairs

Coastal planning for adaptation to climate change in Halifax Regional Municipality: scenarios for a 100-year planning horizon

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Abstract:

Climate-change adaptation planning is being developed in the Halifax Regional Municipality (HRM) within the context of the 25-year Regional Municipal Planning Strategy. This land use planning strategy adopted in 2006 recognizes the consequences of climate change and the need for scientific research to inform a comprehensive precautionary and adaptive coastal planning approach to minimize negative impacts of rising sea level. In order to provide accurate flood-limit mapping for the project, LiDAR data were acquired in 2007 to produce a high-resolution digital elevation model (DEM). The selection of flood levels for adaptation planning required an understanding of present and future sea-level rise, vertical land motion, extreme water levels (combined tide and surge), harbour seiche and wave runup. The resulting water levels were applied to the LiDAR DEM to visualise the extent and depth of flooding for a range of plausible events that could occur by the year 2100. These studies provide a scientific basis for a set of conceivable scenarios for a 100-year planning horizon.

Government, academic and private sector scientists, researchers and land use planners have partnered to complete a wide range of studies focused on adaptation to climate change stemming from this initial project. These include vulnerability to sea-level rise for commercial, residential, institutional, and park properties adjoining Halifax Harbour, as well as the North West Arm Seawall system and the Salt Marsh Trail network in Cole Harbour. Recommended adaptation strategies are currently being implemented.

The CZC conference presentation will focus on the contributions that scientific study can make to the practice of land use planning and the development of land use policies and associated by-laws for adaptation to the challenges of climate change. Project partners will provide overviews of work undertaken by HRM, Natural Resources Canada, Dalhousie University, the Applied Geomatics Research Group and Coldwater Consulting Ltd.

Contact: John Charles
Planner, Halifax Regional Municipality

The Alternative Land Use Services (ALUS) Program: going above and beyond legislation

Shawn J. Hill

Abstract:

This presentation focuses on the efforts of Island farmers to “grow” a better environment on Prince Edward Island. The province has a long history of agriculture and its importance to the economy cannot be understated. While PEI has aggressive legislation in place to protect the environment, the newly implemented Alternative Land Use Services (ALUS) Program is taking environmental stewardship on private agricultural lands to a whole new level.

The ALUS program is a brand of ecological goods and services (EG&S) programming in which farmers are rewarded annually for environmental services they provide above and beyond minimum legislated standards. Similar (EG&S) programs are common among Canada’s international trading partners, yet there is no national program to support Canadian producers. Prince Edward Island is the first province in Canada to have such a program throughout its entire jurisdiction.

The agricultural community is a key stakeholder in our environment and is well positioned to deliver ecological goods and services for the public good. They have often provided these services with little reward because the marketplace has not traditionally placed a value on good land stewardship. Since adopting the ALUS program as policy on Prince Edward Island, farmers are now getting rewarded annually for providing certain environmental services.

The ALUS program has an annual budget of one million dollars. The goals of the ALUS Program are to reduce soil erosion and siltation of watercourses and wetlands; improve water quality; improve and increase wildlife habitat; and reduce the impacts of climate change. The program goals are being achieved by retiring sensitive areas of land from annual crop production. The development of the program, challenges and results to date will be presented.

Contact: Shawn Hill,
Alternative Land Use Services Coordinator,
PEI Dept. of Environment, Energy and Forestry

A critical look at the components of Coastal Zone Management – with reference to the Philippines and Canada

*J.B. Ross and P.R. Boudreau

Abstract:

Although the concepts that make up Coastal Zone Management (CZM) have continued to evolve and improve, CZM has not gained much traction within the broader regulatory community or with the public. Advances towards its goals, both in Canada and on a global scale, have been disappointing at best. Continued improvement, through the development of new approaches and concepts are necessary if management is to contribute usefully to the preservation of coastal ecosystem integrity, services and resources in the future.

The authors contend that the present approach manages the wrong real estate, the wrong things, at the wrong scale, it targets the wrong people, and it makes the wrong people pay for it. These must all be critically re-examined if appropriate management is to gain a serious foothold in the political and socio-economic consciousness.

Using specific examples from both Buguey, Philippines, and Canada, the authors begin an examination of some of the components leading to a more holistic approach, that targets a more general audience, and addresses the reality of "globalness".

Contact: James Ross,
Instructor,
Nova Scotia Community College

Planning for the future: Preparing young professionals for coastal planning and climate change

*Patricia Manuel and Eric Rapaport

Abstract:

Coastal land use planning, watershed planning and climate change adaptation are prevalent themes in the education of students in the School of Planning, Dalhousie University. Over the past four years, in particular, students in our graduate and undergraduate professional planning programs have undertaken practice-based, independent and team projects exploring climate change impacts at the coast and their significance for land use, planning and development. These projects explore various aspects of coastal hazard, land use risks and policy and plan preparedness throughout Nova Scotia, particularly at the municipal level. Several projects have received funding from National Resources Canada; several have supported Halifax Regional Municipality's climate change adaptation planning for Halifax Harbour; one project was a detailed investigation of the flooding and erosion hazard and land use risk around the entire coast of St. Margaret's Bay, Nova Scotia. Students are also involved in climate change adaptation project work through the School's participation in Atlantic RAC (Regional Adaptation Collaboration).

Our paper illustrates community and practice-based approaches to educating students in climate change and coastal land use planning. The presentation will include an overview of recent projects; will consider the utility of these projects in the community (from community education and climate change preparedness to municipal policy and plan development); and will provide a more detailed look at two projects in the Halifax Regional Municipality. These projects occur in the context of one municipal jurisdiction but with different geographic scope (urban vs. rural) and different data quality (high vs lower resolution). Both projects have yielded useful results for the clients (Halifax Regional Municipality and the St. Margaret's Bay Stewardship Association). The contrast will demonstrate that good climate change planning and community awareness-raising is possible with lower as well as higher resolution data. Lower resolution data are the data typically available to rural municipalities.

Contact: Patricia Manuel, Associate Professor,
School of Planning, Dalhousie University

The Indicators Framework for Evaluating Integrated Coastal Management in Korea

*Jiyeon Choi, Jin-sook Yoon, Heejung Lee, Ji-Ho Jeong, Myoung-Kuk Jeong

Abstract:

During the last 40 years, in spite of diverse and unique natural and environmental values of coastal ecosystem coastal areas in Korea have suffered excessive coastal uses and development due to radical urbanization and industrialization. Since the Rio Summit (1992), The Korean government has endeavored to set up the legislation for integrated coastal management and has equipped with institutional devices governing coastal areas and resources. In recent 10 years, it has accomplished a great deal in the recent efforts, whereas has been numerous discussions on the deficiencies such as lack of integrated guidance and practical instrument for coordinating a wide scope of coastal uses and development. Lastly, as raising the necessity for realizing adaptive management and improving an effectiveness of integrated coastal management, the government has prepared a development of evaluation system for monitoring status and changes in the environmental, socio-economical, and institutional condition in the coastal areas.

This study aims to develop the indicators framework for evaluating integrated coastal management in Korea, and to assist the National Coastal Survey of the Ministry of Land, Transport and Maritime Affairs (MLTM) in improving the national performance measurement system for coastal areas. The methods and procedures used to develop the indicators are as follows: Firstly, we have worked out literature reviews and analyzed the data from national/local programs which have systematic survey. Secondly, coastal specialists were formed to review a coastal indicators framework that that would be appropriate for Korea's situation. Thirdly, we classified five areas of indicators, such as 1) coastal socio-economic, 2) coastal use & development, 3) coastal landscape & ecosystem, 4) coastal water, 5) coastal governance. Lastly, we identified 60 key indicators and 20 core indicator of key indicators.

Contact: Jiyeon CHOI,
Senior Researcher,
Korea Maritime Institute

Working together for climate change adaptation

Gary Davidson and Beate Bowron

Abstract:

With the assistance of the Climate Change Adaptation Branch of Natural Resources Canada (NRCan), the Canadian Institute of Planners (CIP) has developed a series of learning modules on climate change. One of these modules is a two-hour workshop session designed as an introduction to climate change. The purpose of this learning module is to introduce a planners and related professionals to climate change issues and to determine actions that can be taken to adapt to climate change in local communities.

This two-hour module is delivered in a highly interactive manner and covers four main topic areas. These are:

1. Causes and impacts of climate change
2. How will climate change? – Obtaining and understanding climate change information
3. How will my community be impacted? – Assessing opportunities, risks and vulnerabilities
4. How can I respond? – Planning your climate change response

CIP is very interested in working with fellow professionals to tackle the challenges of climate change adaptation. A description of CIP's climate change initiatives can be found at www.planningforclimatechange.ca.

Contact: Gary Davidson, Canadian Institute of Planners

Beate Bowron, Canadian Institute of Planners

Climate Change Adaptation in Atlantic Canada

Tammy Keats

Abstract:

Communities in Atlantic Canada are experiencing the impacts of climate change and this will intensify in the future. With the majority of Atlantic residents located near the coast and along inland waters, the infrastructure and resources they depend on are increasingly at risk.

Recognizing the need to help communities, the four Atlantic Ministers of the Environment agreed to work together under the Atlantic Adaptation Strategy. With the goal of helping communities, one of their first initiatives was to work collaborative on common climate change issues and seek funding from Natural Resources Canada's Regional Adaptation Collaborative (RAC) Program. Coordination was facilitated by the four Atlantic Departments of Environment through the formation of the Atlantic Climate Adaptation Solutions (ACAS) Association. ACAS Initiatives were designed to examine coastal and inland hazards including coastal erosion, storm surge and flooding; as well as, impacts on infrastructure and groundwater quality and quantity.

The collaboration facilitated through the RAC program spans the four provinces, local professional and community associations, technical experts and academia working together to help Atlantic communities. ACAS will assist with integrating adaptation into community planning and enhancing the capacity of communities and professional associations. Some expected outputs of this regional collaborative include: community-based vulnerability assessments, flood and hazard mapping for high risk areas, protocol development to assist with future work, a summary of infrastructure vulnerability, and recommended adaptation measures with practical examples from case study communities. Further, climate change adaptation will be integrated into annual conferences of professional associations including that for Atlantic planners, engineers and Municipal Associations.

This panel discussion will integrate an overview of the RAC Program; a review of future climate scenarios for Atlantic Canada and outline the ways in which jurisdictions in this region are working together with a wide variety of partners to help communities identify their vulnerabilities and adaptation options.

Contact: Tammy Keats, Manager of Resource
Program, Development Policy and Planning
Division, Department of Environment and Conservation

Coastal Erosion along the south eastern coastline of the Avalon Peninsula, Newfoundland

*Sheridan Thompson-Graham and Norm Catto

Abstract:

In March 2009 a coastal erosion project for Mistaken Point Ecological Reserve was undertaken with the purpose of understanding dominate erosional and depositional processes affecting the integrity of the coastline of Mistaken Point Ecological Reserve (MPER). The 5.7 km² coastline within MPER is internationally known for its 565 Ma Ediacaran fossil bearing horizons. The stratigraphic section contained within MPER is ~2.5 km thick, exposed as rock platforms and cliffs along an indented and morphologically variable coastline 24 km in length.

The primary catalyst for the project was the reserves entrance into Canada's official Tentative List as a potential UNESCO World Heritage Site. As a result, the importance of conservation management has been emphasized, with effectiveness that can only be assured once dominant process and rates of those processes are identified along specifically chosen sites within the reserve. The four sites chosen for assessment include: two sites within Pigeon Cove (Western MPER) and two sites within Mistaken Point (central MPER).

Thus far, observations have pointed to the following dominant erosional processes at all four sites: increased storm intensity and frequency, geological structure, angle of cove, as well as protective headlands that contribute to wave power and angle of hit. Sites with fossils present are also under threat of illegal casting (leaving behind erosive chemicals), and removal of fossils by diamond saw, creating weak points within the rocks structure. Foot traffic due to people visitation is of great concern at Mistaken Point, while frost action seems to be an issue of coastal wear at Pigeon Cove. At present, further quantitative analysis is being undertaken to understand the rates of erosion that might be present at each of the above sites.

Contact: Sheridan Thompson-Graham,
Graduate Student, Memorial University

Spatial planning and legal interests: lessons from the St. Margaret's Bay, Nova Scotia marine cadastre pilot

Sue Nichols

Abstract:

Marine spatial planning is a tool for managing the use of marine resources and space. Following on workshops held at the 2008 CZC Conference in Vancouver, where national and international examples of marine spatial planning were discussed, this presentation addresses the role of information on legal interests in spatial planning. A “proof of concept” demonstration of a marine cadastre (a record of legal interests) was conducted in 2008-09 by the University of New Brunswick in St. Margaret's Bay, Nova Scotia as part of COINAtlantic. This presentation will discuss the project, its potential role in marine spatial planning and the lessons learned.

Contact: Sue Nichols, Professor,
University of New Brunswick

Marine planning as a tool to address threats to First Nations communities

*Russ Jones, Catherine Rigg, Jason Thompson, Janet Winbourne and Chris McDougall

Abstract:

The Haida Nation is preparing a marine use plan for Haida ocean territory and at the same time is engaging with neighbouring First Nation and Federal government partners in a marine planning process for the Pacific North Coast Integrated Management Area (PNCIMA) in northern British Columbia.

The Haida vision is for an ocean with healthy intact ecosystems that continue to sustain Haida culture, communities, and an abundant diversity of life for generations to come. Threats to this vision include loss of community access to fisheries, a variety of potentially unsustainable fisheries, increases in shipping traffic in Haida Gwaii waters (including oil tankers), rising sea levels as a result of climate change, and an interest in salmon aquaculture (despite a current moratorium in northern BC). Opportunities include value-added marine and cultural tourism, development of an offshore windfarm project, joint ventures and revenue-sharing in recreational fisheries enterprises, and reinvigoration of the local seafood sector.

The Haida marine use planning process will be described including the important role of traditional knowledge in planning. Marine planning shows promise to address some but not all of these threats and will also facilitate opportunities through spatial planning and development of new governance structures that include First Nations as decision-makers.

Contact: Russ Jones, Project Manager,
Marine Planning, Haida Fisheries Program

Coastal Management at the Local Level: Developing Land-Use Standards and Best Management Practices for Municipal and First Nation Governments in the Bras d'Or Lake Watershed

Jason Naug and Shelley Denny

Abstract:

The Bras d'Or Collaborative Environmental Planning Initiative (CEPI), a partnership of federal, provincial, municipal, and First Nation governments, industry, academia, NGOs, and community members operating in the Bras d'Or Lake of Cape Breton, Nova Scotia, are currently in the process of developing an overall management plan for the lake and its watershed.

Part of this plan will be to support the adoption of land development standards within the watershed. There are currently no municipal government policies or bylaws aimed at protecting the Bras d'Or Lake from the potential impacts of land development. Similarly, few provisions are working to control development within the five First Nation communities on the Bras d'Or.

This presentation will review efforts of the CEPI to develop relevant policies and bylaws for adoption by the four municipal governments in the Bras d'Or watershed and efforts undertaken to facilitate their adoption. A complimentary process being undertaken in the First Nation communities targeting the Band Councils will also be profiled. Lessons learned from both processes and implications for other geographic areas will be shared.

Contact: Jason Naug,
Fisheries and Oceans Canada

Shelley Denny,
Unama'ki Institute of Natural Resources.

Modeling Fecal Coliform Particle Transportation in the Annapolis Basin Using MIKE 21: Examining the Relationship Between Water Quality and Clam Bed Closures

*Peter MacDermott, Tim Webster, and Bill Livingstone

Abstract:

Clam harvesting on the intertidal mudflats of the Annapolis Basin has taken place throughout history, becoming a major local industry during the 1800's and leading to the development of processing and shipping plants in the area. However, for the last 30 years an increasing number of harvesting zones have been temporary closed, or switched to depuration only harvesting due to bacterial contamination. At present a blanket approach is being taken to close clam harvesting zones after heavy rain fall events due to the lack of viable water quality data for the intertidal area. The surrounding communities of Digby, Smiths Cove and Bear River all have waste water treatment plants that release into the basin and are potential sources of contamination, especially if they are coupled with sewer/storm water infrastructure. Monitoring locations have been installed in the major tributaries of the Basin where pressure transducers record water level and flow as well as water quality samples are collected. With these inputs we are able to use a MIKE 21 hydrodynamic model to examine how particles of fecal coli form are transported and accumulate throughout the intertidal, providing key decision makers with valuable information for deciding on clam bed status.

Contact: Peter MacDermott,
Research Technician,
Applied Geomatics Research Group

Marine spatial planning and gaps in marine conservation in Washington State

Joanna Smith

Abstract:

In March 2010, the Washington State legislature enacted a new state law on Marine Spatial Planning, the first such law on the west coast of the United States, and only the second in the nation. One important question for future marine planning efforts will be to determine if current management practices adequately provide long-term protection for marine species and habitats?

We conducted a gap analysis for all Washington State and adjacent federal waters to assist a State effort to evaluate existing marine protections. The analysis used existing geospatial data sources to identify marine areas that met five specific criteria: managed explicitly for conservation, permanent and long lasting protection, year round protection, legal geographic coordinates, and within the study area.

The process for assigning conservation management status was developed using published gap analyses and peer review and included a combination of access, biological removals and seabed alterations. We inventoried more than 150 different areas under the jurisdiction of 11 different state, federal or private ownerships and found that marine protection fell under 10 different types/names in State waters and seven in federal. We merged overlapping management areas together and found as many as six different managers/owners in one location, with some managers/owners having up to 14 different closures of one type. Overall, less than 1% of State and federal waters had high or medium protection because most areas were open for biological removals and seabed alterations.

These results highlight the difficulties of a sector-by-sector approach to ensure high management protection, and provide an empirical basis to evaluate other models that might result in higher overall protection for marine resources.

Contact: Jo Smith,
Marine ecologist,
The Nature Conservancy

Swimming with Eelgrass: A holistic science approach to integrating human and natural systems in Malibu Bay Massachusetts

*Lisa Greber and Anamarija Frankic

Abstract:

Coastal ecosystems globally are under increasing stress from development, resource extraction, pollution and other causes; environmental degradation to these ecosystems has included the collapse of many fisheries, the loss of subaquatic vegetation, and potentially worrisome changes in the climate system. How might we manage more effectively, recognizing that “the environment sets the limits” for human activities?

This paper will present a three stage holistic science approach to living within environmental limits that was tested in a pilot project in Malibu Bay. The first stage is a baseline environmental and social assessment of ecological conditions at Malibu Bay, including monitoring for water quality and invasive species, transect surveys of the health and extent of salt marsh, and social science surveys of day users. These surveys address users’ knowledge of and support for the beach salt marsh as a proxy to determine potential support or opposition to restoration of eelgrass and eastern oysters.

The second stage is to develop GIS-based models using evolutionary computing techniques to evolve patterns of human use of the bay for swimming, boating, fishing, and other purposes that are integrated with potential salt marsh grass, eelgrass and oyster placements. The model will be designed to prioritize the system’s ecological needs that are the necessary basis for human economic and social ones.

The final stage of the project will involve sharing visualizations of a range of models to the communities surrounding the Bay, to determine if such models and visualizations aid communities in re-integrating their activities with the ecosystems around them.

It is hoped that this holistic science approach and the tools developed herein may also prove useful for the larger Green Boston Harbor Project as well as in other coastal settings facing similar issues.

Contact: Lisa Greber,
University of Massachusetts Boston

Coverage of coastal zone issues in undergraduate physical geography textbooks

Terence Day

Abstract:

Introductory physical geography is a popular first year undergraduate course taken by many students throughout North America. Typically, the majority of students are registered in arts, and take "Intro physical" in order to meet the science requirements for their BA degree. As such, the course offers an important opportunity for students from a wide range of backgrounds to learn about the science behind the issues that impact on coastal communities. But to what extent do introductory physical geography textbooks present coastal zone issues to students?

This work focused on three issues extensively researched by physical geographers and which we might reasonably expect to be prominent in introductory physical geography textbooks, viz.: coastal erosion; sea level rise, and; decline in coastal biodiversity.

Nine textbooks were examined (5 US; 3 Canadian; 1 UK) to determine their coverage of the issues. It was found that although the geomorphic products of coastal erosion were well described in all texts, the causes and contributing factors were only discussed in very general terms. Sea level rise received variable coverage. In those cases where there was moderate coverage, the focus was on modeled potential future effects, rather than data on recent change. With the exception of coral reefs, coastal biodiversity issues received little attention in any text.

It is clear that coastal zone issues receive relatively little consideration compared with coverage of inland environments in introductory physical geography textbooks. The lack of coastal material in the textbooks both reflects and reinforces an indifference to the pressing problems that confront coastal communities.

Contact: Terence Day,
Professor,
Okanagan College

Impacts of climate change on storminess and coastal erosion in the Gulf of St. Lawrence

*Savard Jean-Pierre and François Morneau

Abstract:

Risk management in the coastal zones will be deeply affected by climate change (CC). Sea level rise, changes in extreme levels and waves caused by storms are part of climate related factors that introduced new challenges in assessing coastal erosion and vulnerability of coastal infrastructures.

A study project on the impact of CC in the Gulf of St-Lawrence has been completed by Ouranos Consortium and his partners in 2008. This study has addressed several issues related to climate change in de GSL, such as the impact of CC on extreme sea level, sea ice and shore ice conditions, thaw and frost processes and several other physical processes that will be affected by CC. Assessing the impact of CC on extreme water levels and wave climate was a major part of this study. Atmospheric depressions travelling in the nebourhood of the GSL were characterized by combining several modelling tools, including a wave model driven by a 3D oceanic model of the GSL, a storm tracking algorithm, several meteorological models, reanalysis and a regional climate model and a coupled oceanic-ice-climate model. This new approach proved to be robust and efficient in assessing the impact of future storminess at specific test sites.

Validation tests have shown that it is possible identify major storm events that impacted specific coastal area, to assess the variability (frequency and intensity) of these storms over time and to model the evolution of these using climate models at regional level. Results were used to classify the exposure of various coastlines and to select specific adaptation options to reduce the resulting risk for coastal communities and infrastructures at the three test sites of the project (Sept-Îles, Percé and Magdalen Islands).

Contact: Savard Jean-Pierre,
Oceanographer, Ouranos

Modelling The Effects of Reduced Sea Ice on Storm Waves, Currents and Sediment Transport on the North Shore of Prince Edward Island, Canada

G.K. Manson^{1,2}

¹*Ph.D Candidate, University of Guelph, Guelph, Canada*

²*Coastal Geoscientist, Geological Survey of Canada, Dartmouth, Canada*

Abstract:

The north shore of Prince Edward Island (PEI) is a sandy, multi-barred coast with limited fetch in most directions but open to the Gulf of St. Lawrence for several hundred kilometers to the north. In the fall and winter, storms tracking northwards across Prince Edward Island and into the Gulf and can bring sustained winds from the northeast to northwest up to 110 km/h and generate waves up to 7 m significant height. In winter, sea ice of spatially and temporally varying concentrations reduces wave formation and wave-generated currents capable of transporting sediment. One predicted impact of changing climate is reduced sea ice in the southern Gulf of St. Lawrence. The Gulf has been predicted to be ice free by 2040 suggesting that annual cumulative wave energy will be greater than present day, with implications for storm-driven currents, sediment transport and rates of coastal change.

An optimal configuration of the Mike21 spectral wave, hydrodynamic and sand transport modules (commercially available from the Danish Hydraulics Institute) is developed for Brackley Bight and verified against S4 current meter and RALPH data collected during a sediment transport experiment in 1999. The model is successfully used to simulate storms under ice free conditions. Mike21 is found to not adequately include sea ice for detailed nearshore modelling purposes, so a novel technique is developed to better examine the interactions between sea ice, storm wave and current development and subsequent sediment transport and to contribute to understanding future sediment transport and evolution of the north shore of PEI.

Contact: Gavin Manson

Remote Sensing of SPM Concentrations in the Upper Bay of Fundy

*Gary Bugden and Gordana Lazin

Abstract:

Throughout history, anthropogenic modifications have caused extensive changes in the hydrological and geological characteristics of tidal rivers in many parts of the world. One local example of tidal river modification is the causeway constructed in the late 1960's in the Petitcodiac River near Moncton, New Brunswick.

This construction resulted in rapid, readily apparent, sediment accumulation on the immediate downstream side of the barrier. However, recent analysis indicates that the consequences of causeway construction extend nearly 34 km downstream. Because of these problems and the failure of the causeway to allow adequate passage for migratory fish it is slated for extensive modification in the near future.

Recent advances in remote sensing techniques allow ocean colour satellite imagery to be used to estimate the distribution of suspended particulate matter (SPM) in the coastal zone. A series of satellite images is used to develop baseline data on the distribution of SPM at the mouth of the Petitcodiac River before causeway modifications and, incidentally, in the region of recent tidal power generation experiments in Minas Basin.

Contact: Gary Bugden,
Physical Oceanographer,
Fisheries and Oceans Canada

The Relationship Between Coastal Erosion and Sandy Beach Invertebrate Community Structure on PEI's North Shore

*M.R. MacMillan and P. Quijon

Abstract:

Sea level rise influences the rate of shoreline erosion and constitutes one of the many factors causing spatial change among sandy beach habitats. Prince Edward Island's north shore is particularly vulnerable to surges and storms, with shoreline erosion rates as high as 330 linear cm/yr being recorded in the last decade. Since sandy beach invertebrates associated to exposed sandy beaches are assumed to be primarily controlled by species specific responses to swash climate and sediment characteristics, they should respond to physical changes such as those linked to erosion. We were prompted to document their community structure, and hypothesized that areas exposed to different levels of erosion will exhibit different intertidal characteristics and consequently, different faunistic densities and distributions.

We sampled 12 sandy beaches associated to three main types of backside formation: dunes, till and sandstone. At each beach we collected 5 core samples along 4 transects perpendicular to the shore from high to low tide (20 samples per beach). We measured slope and identified erosion levels based on proximity to Parks Canada's erosion monitoring stations. Densities were calculated as individuals/linear meter, with the highest overall densities found in a couple of sandy beaches associated with dunes. We found a significant relationship between erosion level and density that was best described by a power function. Unexpectedly, the relationship was positive, suggesting that beaches with higher erosion rates hold higher total densities as well.

We discuss these results in the light of the effects that physical disturbance is expected to exert over sandy beach invertebrate densities.

Contact: Mitchell MacMillan,
University of Prince Edward Island

Mesoscale Measurement and Modelling of Coastal Foredune Dynamics, Greenwich Dunes, Prince Edward Island

Irene Delgado-Fernandez ^{1, 2} and Robin Davidson-Arnott ¹

¹ Department of Geography, University of Guelph, Guelph, Ontario,

² Centre for Coastal & Marine Research, School of Environmental Sciences, University of Ulster, Coleraine, Northern Ireland

Abstract:

Measurement and modelling of aeolian sediment supply from the beach to coastal foredunes on a scale of months to years is complicated by the presence of a number of factors which may act to limit sediment supply from the surface and transport by wind, including: surface moisture, snow and ice cover and beach width.

Predictions of sand supply based on hourly average wind speed and using standard transport equations typically overestimate sand supply by up to an order of magnitude compared to measured deposition. The collection of a time series of hourly data over nine months using a system incorporating 3 digital cameras to measure beach surface moisture, beach width and the presence of snow and ice, as well as sensors for measuring wind speed and direction, and sediment transport has provided new insights into the dynamics of transport events driving sediment from the beach toward the foredune at Greenwich Dunes, Prince Edward Island National Park, Canada. The camera system also permits monitoring of storm events that may result in erosion of the toe of the dune and return of sediment to the littoral system.

This paper summarizes the key aspects of aeolian sediment movement for the period and utilises the data set to explore the development of a modelling approach that can be applied to improve prediction of sand supply to coastal dunes over periods of months and years and can enhance the management of coastal dune systems in cold climates.

Contact: Robin Davidson-Arnott,
Department of Geography,
University of Guelph

Particle dynamics of Integrated Multi-Trophic Aquaculture (IMTA) sites

*Lindsay Brager, Jon Grant and Peter Cranford

Abstract:

Aggregations of aquatic organisms, namely cultivated fish, produce large quantities of allochthonous particulate organic matter, such as feces. This has been shown to have negative effects on the surrounding environment.

Integrated Multi-Trophic Aquaculture (IMTA) has been developed as a means to minimize waste effects of fish farms on the water column and benthos and potentially increase economic return compared to monoculture. IMTA combines the cultivation of fed aquaculture species (e.g. finfish) with organic extractive species (e.g. bivalves) and inorganic extractive species (e.g. kelp). The Canadian IMTA Network (CIMTAN) is a strategic national network of researchers designed to develop commercial field aquaculture systems to mitigate organic and inorganic enrichment by capturing wastes and turning them into extractive crops. Although pilot IMTA projects in the Bay of Fundy have demonstrated success with increased production of mussels grown in proximity to salmon cages, little research has been done pertaining to the particle dynamics of IMTA systems.

Working under CIMTAN in a collaborative project between DFO and Dalhousie University, I will investigate the organic particle load generated from IMTA sites by examining particle transport and sedimentation in the water column and to the seabed. Towed sensor vehicles (BIOAcrobat), in conjunction with current meter moorings, will be used to spatially map particulate plumes. Sediment traps will be used for examination settling flux. Furthermore, sediment-profile images (SPI) will be taken below IMTA sites to investigate benthic impacts.

These methods will provide necessary information on the fluxes and biodeposition of particulate organic matter at IMTA sites to determine their net efficiency in extraction of waste nutrients and amelioration of benthic enrichment impacts.

Contact: Lindsay Brager,
Department of Oceanography,
Dalhousie University

Jon Grant,
Department of Oceanography,
Dalhousie University

Peter Cranford,
Department of Fisheries and Oceans

Le littoral acadien du sud du Golfe du St-Laurent : vulnérabilité et résilience

*Omer Chouinard ¹, Steve Plante ² et Gilles G. Martin ³

¹ *Université de Moncton*

² *Université du Québec à Rimouski*

³ *Collège Communautaire du Nouveau-Brunswick*

Résumé :

Le littoral acadien du Sud du Golfe du Saint-Laurent est particulièrement vulnérable aux inondations et à l'érosion causées par les changements climatiques. Dans cet exposé nous allons traiter de trois études de soit Pointe Duchesne, Le Goulet et Pointe Carron. Ces communautés ont des caractéristiques particulières : Pointe Duchesne, lieu de Villégiature, est à proximité de la ville de Shédiac. C'est un district local de service situé sur les côtes du Déroit de Northumberland. Il est sans autorité municipale et sa population, essentiellement anglophone, oscille de 1000 habitants de novembre à avril à 3000 habitants de mai à octobre. Le Goulet est une municipalité qui a vu sa population passée de 1150 habitants à 880 habitants de 1991 à 2006. Il s'agit d'un village de pêcheurs, essentiellement acadien et francophone, situé le long du Golfe du Saint-Laurent qui a subi une perte de population étant donné la crise dans le secteur des pêches à compter des années 1990. Pointe Carron composée de 60 résidences, sur les côtes de la baie des Chaleurs, est un endroit qui est passé de site de villégiature à des résidences permanentes depuis trente ans. Ce site côtier fait partie de la ville de Bathurst composée d'une population mixte (anglophone et francophone). Cette ville industrielle de 12,700 personnes est fondée sur l'industrie des pâtes et papier qui est en perte de vitesse étant donné les difficultés de l'industrie forestière. Nous avons mené une recherche-action participative dans ces trois communautés afin d'en arriver à des propositions qui émanent de la population locale en lien avec les différentes agences gouvernementales et les associations de développement durable. Nous voulons faire état du processus entrepris et des résultats qui se traduisent en politiques publiques. Les politiques publiques varient dans les trois cas et font état de la résilience communautaire.

Personne contacte: Omer Chouinard
Professeur, Université de Moncton

Application of Ecosystem-Based Management Principles to Design Erosion Mitigation Alternatives for Point Pelee National Park in Ontario

*Pete Zuzek, Brian Craig, Tammy Dobbie and Vicki McKay

Abstract:

Point Pelee is one of Canada's smallest National Parks and yet located in the ecologically rich Carolinian Zone of south-western Ontario features more species at risk than any other National Park in Canada. It is also a migratory corridor for over 370 species of birds and a popular destination for naturalists and beach enthusiasts alike. Unfortunately, the park's beaches and the fragile marsh ecosystems they protect are under siege due to a host of updrift anthropogenic impacts and management decisions made in the 20th century. These risks, in turn, negatively impact water quality, the beach ecosystem, and marsh habitat that support the critical species and recreational pursuits within the park.

Baird recently completed an investigation for Parks Canada and the Essex Region Conservation Authority to develop erosion mitigation strategies for the park within the context of the existing management plan focused on improving ecological integrity. In other words, it wasn't just beach nourishment and engineering structures to stop erosion. The alternatives were developed to enhance aquatic and terrestrial habitat while reducing the long term recession rates within the park.

Contact: Pete Zuzek,
W.F. Baird & Associates Coastal Engineers Ltd

Brian Craig,
Parks Canada

Tammy Dobbie,
Parks Canada

Vicki McKay,
Parks Canada

Scoping a marine and coastal rights registry for Canada: needs and priorities

Marine and Coastal Registry Task Team

Abstract:

A Marine and Coastal Registry (Marine Cadastre) Task Team has been established to prepare a business case for evaluating the need for and securing long term commitment for investment in the development of a national marine and coastal rights management regime for Canada.

The Task Team is co-chaired by Natural Resources Canada, Surveyor General Branch and Fisheries and Oceans Canada, Oceans Directorate. The work of the Team builds on the COINAtlantic initiative of the Atlantic Coastal Zone Information Steering Committee (ACZISC) in support of Integrated Coastal and Ocean Management (ICOM) and on the online marine cadastre prototype developed under the leadership of Dr. Sue Nichols, University of New Brunswick, for St. Margaret's Bay, Nova Scotia.

The Task Team has defined the Marine and Coastal Registry as an integrated system of registries that is fundamental to enable the systematic public recording of all recognised legal rights, restrictions, and responsibilities related to ocean and coastal space (legislative framework, people, data infrastructure).

The registry could be a key element of an Integrated Marine and Coastal Information System (IMCIS) covering Canada's ocean and coastal spaces and provide a foundation for the integrated management of Canada's oceans and their natural resources.

The Workshop will include presentations of the NRCan and DFO perspectives on a Marine and Coastal Rights Registry (Marine Cadastre) and an Integrated Coastal Marine Information System, and the COINAtlantic and St. Margaret's Bay initiatives. The Task Team will present its work to date and solicit feedback from Workshop participants on specific topics:

- What are your general impressions? Is a Marine Rights Registry required?
- How would you support such an initiative? What is required to get you engaged?
- Who should be involved in the development of a Marine Rights Registry?
- What are the primary outcomes/results such a system would allow you to achieve? How would you use it? Which questions does the system need to answer?
- What are the potential barriers for implementation?
- What do you think should be the next steps in making a Marine Rights Registry a reality?

Contacts: Jean Gagnon, Surveyor General Branch, Natural Resources Canada

Darren Williams, Oceans Directorate, Fisheries and Oceans Canada

WORKSHOP: Decision support tools for CZM

Bruce G. Hatcher

Abstract:

The importance of integration to land-sea planning and management in the coastal zone is well-recognized. The object of integration is generally acknowledged as the charismatic ecosystem or component. What remains vague, especially in the over-governed society of modern Canada, is the mechanism for integration of governance. A challenge is that various contributors to decisions come from very different cultures (academic, vocational, corporate and societal), and do not understand the information compiled to support decision making in the same ways. A wide range of accessible, common use tools can be used to facilitate collaborative decision making. They draw on experience in the natural, social, health, educational, political and management sciences; as well as the creative, recreational and entertainment arts to develop platforms and products that foster effective inter-agency and interpersonal communication. One example is the use of GIS-based scenario models to portray alternative futures in terms of land use maps and movies for watershed ecosystems under different regulatory regimes. The Workshop will explore current examples of theory and practice in the development of decision-support tools for ICZM in Canada and beyond.

Two or three invited speakers will be selected to highlight conceptual, technical and community aspects, and submitted papers and posters will be arranged to complement and contrast these perspectives. The chair will maintain strict control on scheduling and timing to allow documented discussion, leading to a brief output of ideas and examples.

Contact: Bruce Hatcher, Chair in Marine
Ecosystem Science, Cape Breton University

The role of sufficiency economy philosophy in poverty alleviation: A preliminary exploration in coastal Thailand

Kungwan Juntarashote and *Ratana Chuenpagdee

Abstract:

"Sufficiency economy" as a philosophy began in Thailand with the concept pronounced by its revered King in the 1970s. The question remains whether such idea is practical, especially when applied to places commonly associated with problems like resource overexploitation, multiple use conflicts, stakeholder marginalization, and poverty.

In this paper, we report findings from a study aiming to understand how coastal communities cope with the pressure affecting their livelihoods, how they go about alleviating poverty, and whether such mechanisms can be attributed to the sufficiency economy philosophy.

The study was conducted in four coastal communities using key informant interviews, group discussion and field observation. We found that the concept of sufficiency economy was repeatedly referred to. While all communities were vulnerable to changes and pressure of resource competition brought about by industrialized fisheries, coastal development and tourism, those expressing a strong pursuit of the sufficiency economy idea demonstrated better strategies in dealing with the situations.

We submit that a critical examination of the relationship between the sufficiency economy philosophy and poverty alleviation is useful in providing ways to breaking the vicious circle that poverty creates, and to creating satisfying lifestyle.

Contacts: Kungwan Juntarashote,
Kasetsart University, Thailand

Ratana Chuenpagdee,
Memorial University, Canada

Living by our wits: linking climate change adaptation and coastal policy in Nova Scotia

Jennifer Graham

Abstract:

Nova Scotia's coasts are identified as highly sensitive to climate change impacts. Current patterns of intensifying coastal development are increasing the vulnerability of coastal ecosystems and coastal infrastructure. Coastal planning and management are low-cost, effective ways to prepare for climate change. Nova Scotia is currently developing a Sustainable Coastal Development Strategy.

This paper explores how an effective provincial coastal policy can be an effective tool to help communities prepare for climate change using through adaptive management. It is based on a discussion paper prepared by the Ecology Action Centre on coastal policy options for Nova Scotia.

Contact: Jennifer Graham,
Coastal Coordinator,
Ecology Action Centre

Geocontainment technology in coastal protection

Alan Juncker and *Andy Lister

Abstract:

This presentation will offer information for coastal protection as it relates to Risk Reduction Systems & Techniques. It will explore aspects of a typical installation of 31,000 linear feet (9.5 km.) of geocontainment shore protection. Geocontainment technology provides a solution for protection of shorelines from erosion during storm events and has been successfully used in many hundreds of projects throughout the world.

Contacts: Andy Lister,
Technical Director,
Canadian Geocontainment Alliance

Planning coastal infrastructure under conditions of sea level rise and climate change

*M.H. Davies, D. Wiebe, N.J. MacDonald and J. Charles

Abstract:

The Halifax shoreline is presented as a case study in developing long-term planning strategies for waterfront municipal infrastructure. Three sites in the Halifax region have been assessed in terms of their evolution and performance over the past century and in terms of their expected exposure to increased sea levels under climate change scenarios. Structures examined include parks and pathways, seawalls and coastal revetment.

A comprehensive analysis has been developed that predicts the likelihood of failure or damage to a structure over time under conditions of rising relative sea levels. The analysis uses the results of tide and wave modeling along with engineering predictors of wave uprush, overtopping and structural damage. Under conditions of sea level rise, designing for an event such as the 1:100yr storm is complicated by the fact that nearshore wave conditions are continuously changing.

With this new method, the cumulative probability of failure of a structure is computed on a year-by-year basis in a manner that properly reflects the likelihood of failure increasing as sea levels rise. This approach provides a systematic method for planners and designers to account for climate change scenarios. Interestingly, this analysis clearly illustrates the sensitivity of nearshore facilities to the effects of sea level rise: In areas where shallow water causes the breaking of storm waves, increases in sea level can cause direct and non-linear increases in wave loading and overtopping. Consequently, shallow-water regions can be particularly vulnerable to climate change.

Contact: Michael Davies,
President,
Coldwater Consulting Ltd.

Building resilient coastal communities in British Columbia: a case study of climate change and adaptation in Ucluelet

Mary Liston

Abstract:

Despite the biophysical and social susceptibility of Canada's coastline to the potential impacts of climate change, little is known about how these changes will be experienced within particular coastal areas and communities, and perhaps even less is known about the resilience of these communities to absorb climate stressors and persist in the face of change. The purpose of the study is to increase understandings of the potential impacts of climate change on coastal and marine resources and ecosystems and the communities they support, and to increase the capacity of coastal resource-connected communities to absorb and accommodate these changes. This is done in a case study analysis of Ucluelet, British Columbia.

In considering the limitations of conventional climate impact assessment methodologies in understanding the scale and context-specific interactions and outcomes of climate change in particular coastal places, this research uses a linked social-ecological community-centered approach. The approach draws upon the local, practical knowledge of community members and actors as well as the kinds of knowledge created in the natural and social sciences in order to explore sources of social and biophysical stress (vulnerability) that constrain, and sources of social and biophysical capacity that enable the community of Ucluelet, and ways in which levels of capacity and therefore resilience may be increased. On the basis of results obtained in the case study analysis, it is suggested that the challenge for Canada's coastal communities is to sustain and enhance sources of resilience within communities and their life-supporting ecosystems. This will not be achieved solely by attempting to reduce or eliminate environmental change and variability (which typically involves mitigation and structural adaptations), but must involve the development of mechanisms for building the capacity of communities and environments to deal with system disturbance and sustain in the face of change and uncertainty (resilience).

Contact: Mary Liston,
Masters Student,
MA Geography, University of Victoria

Sea-level rise studies in the Maritimes: what have we learned and where are we going?

Kyle McKenzie

Abstract:

Sea-level rise studies in the Maritime Provinces have evolved from being mostly desktop studies, through major multi-million dollar multi-disciplinary endeavors, to being smaller more specialized efforts. What have we learned from these different approaches, and how can this guide us to better results in the future? Multi-thousand and multimillion dollar approaches have produced different results, but not necessarily proportional in their value to end users.

Regardless of the approach, there is a growing awareness of the coastal problems being exacerbated by climate change and sea-level rise: storm surges, coastal flooding, and coastal erosion and deposition. Public sensitivities to these impacts are leading to increasing demand for solutions, including climate change adaptation plans. Large scale, high profile projects sometimes create unrealistic expectations among the public and municipal officials as to how coastal communities should adapt to climate change and who is responsible for undertaking such efforts. Reconciling these expectations with actual needs is the first step in identifying an appropriate adaptation strategy. Matching needs of the end user to the output of a study will go a long way to scaling a study appropriately and providing a cost effective solution for the community. Both high tech and low tech approaches are possible and throwing lots of money at a study isn't always the answer, especially if the community has neither the technical nor resource capacity to work with the results.

Examples of different scale approaches utilized throughout the Maritimes in the recent past are examined to illustrate the issues above. Upcoming studies are mentioned with a view to assess whether we are making progress on better tailoring such studies to users' need.

Contact: Kyle Mackenzie,
Climate Change Scientist,
Nova Scotia Department of Environment

Adaptation to Sea Level Rise, Storm Surges, and Erosion

*Mike Pearson and Roger Mosher

Abstract:

The effectiveness of adaptation planning is enhanced by estimating the long term impact that arises from coastal processes and events. The Coastal Zone Disaster Management Decision Support System (Coastal DSS) increases our understanding of coastal environments in terms of threats posed by long term and on-going climate change; for example, increased rates of sea-level rise.

Using data from computer models that predict water levels using historic observations and physical coastal processes, the Coastal DSS enables the creation of flood risk maps, erosion risk maps, and economic impact assessments and recommendations for coastal areas. The result of applying these processes is an understanding of coastal zone changes or events, which pose a threat, and identification of various steps that can be taken to avoid or ameliorate the effects of such changes or events. The coastal DSS is an integrated solution designed to address the need for risk assessment and mitigation for the insurance, real estate and financial industries, as well as provide engineering firms and municipalities a focused approach for effectively managing their land base.

The paper includes a demonstration of methods to analyze and communicate a) risks due to coastal processes, and b) the potential effectiveness of specific mitigation and adaptation measures. An animated 3-D rendered view of an advancing coastal flood on a LIDAR representation of the terrain, complete with topographic features, is presented. A counter displaying rising water level against diminishing probability is depicted in the animation. What-if scenarios are presented (i.e. a proposed dam) and their predicted roles in mitigating coastal flooding are demonstrated.

Contact: Mike Pearson,
Director of Research and
Commercialization, GeoNet Technologies Inc.

Coastal Communities challenges to deal with climate change in the St- Lawrence River Estuary and Gulf

Steve Plante, Chantal Gagnon, Omer Chouinard, Michel Lajoie, Pierre André, Darren Bardati, Geneviève Brisson, Christopher R. Bryant, Catherine Choquette, Sabrina Doyon, Marie-Josée Fortin, Yann Fournis, Élise Mayran, Irene Novaczek, Liette Vasseur

Abstract:

La GIZC de l'estuaire et du golfe du St-Laurent présente d'importants enjeux pour les communautés de l'est du Canada et ce, surtout face aux scénarios des changements climatiques. La rapidité avec laquelle des transformations induites par ces changements s'effectuent sur les côtes et les enjeux politiques associés à la gestion de la ressource hydrique demandent que l'on élabore des stratégies d'adaptation et de gestion efficaces et novatrices, à fois collective et individuelle. Plusieurs éléments doivent être pris en considération pour ce faire : 1) Les capacités de résilience des acteurs et des communautés, ainsi que la prise en compte de la viabilité à long terme des collectivités évoluant dans un écosystème vulnérable mais essentiel; 2) La complexité et l'incertitude entourant les systèmes sociaux et les phénomènes environnementaux, qui obligent les acteurs du développement à tenir compte tant des connaissances « expertes » et « locales »; 3) L'intégration de ces types de connaissances pour délimiter les niveaux de vulnérabilité des collectivités et des écosystèmes associés et à accroître leur résilience.

La représentation des divers acteurs dans les mécanismes de prise de décision visant le développement, l'aménagement et l'adaptation des communautés constitue une condition essentielle à la production des saviors nécessaires à la mise en oeuvre de démarches durables. Pour y parvenir, la mise en réseau des associations, des municipalités, des universitaires et des acteurs des secteurs public et privé des zones riveraines, rurales et urbaines permettant de combler et de renforcer les capacités de gouvernance de tous est importante. La notion de communauté concerne la communauté de pratique et la communauté territoriale mobilisée par les membres et les membres associatifs de nos partenaires qui agissent comme agents de diffusion et de changement.

Contact: Steve Plante,
Professeur,
Université du Rimouski Québec à Rimouski

Integrating Climate Change Adaptation into Marine and Coastal Management: Examples from North America

*Rachel M. Gregg, Lara J. Hansen, Jessica Hitt, Jennifer Hoffman, Eric Mielbrecht and
Alessandra Score

Abstract:

Climate change is now widely acknowledged as a global problem that threatens marine and coastal conservation, management, and policy. How to deal with the reality of climate change in marine and coastal management is a challenge we are just beginning to face. Adaptation and mitigation are the two responses commonly taken to address actual and projected climate change impacts. While mitigation attempts to reduce the causes of climate change (greenhouse gas emissions), adaptation is used to prepare for and respond to the effects of climate change. Adaptation activities are in their infancy and the field is developing in an ad hoc fashion.

This presentation will present the results of an inventory and synthesis of existing and proposed climate change adaptation projects in the marine and coastal environments of North America. It will highlight efforts taken by practitioners from different regions and scales to make their work climate-informed. This talk will showcase the types of activities that are currently underway in the conservation world and highlight successes and possibilities for coordination.

Contact: Rachel Gregg,
Scientist, EcoAdapt

The Integration of Ground Based and Airborne Laser Scanning for Coastal Zone mapping

*Tim Webster, Nathan Crowell, Danik Bourdeau, Kate LeBlanc and Stephanie Rogers

Abstract:

Several coastal areas around the Maritimes have been surveyed with airborne LiDAR sensors to construct high resolution digital elevation models (DEMs). While this technology provides unprecedented detail on horizontal surfaces, cleared land or forest covered, it has limitations on imaging steep slopes or vertical structures which are common for many coastal areas.

These steep slopes are typically associated with cliff faces where the material is either bedrock or unconsolidated glacial sediments. These geomorphic features typically are not subject to coastal flooding from storm events due to their local relief, however they are susceptible to erosion, especially the unconsolidated glacial till deposits. Repeat airborne LiDAR surveys offer the ability to map both lateral and vertical changes for low relief morphologies such as dune systems. However, this method has limitations in quantifying the changes for steep slopes since fewer laser shots reflect off of these surfaces from an airborne sensor.

To overcome this limitation and provide a more detailed baseline of elevation measurements to monitor future changes, we have used a ground based laser scanner to survey the cliff face in the Joggins area of the Bay of Fundy. Joggins is a World Unesco heritage site because of the fossils preserved in the sand stone cliffs that are exposed to the high tides in the Bay of Fundy. Monitoring coastal erosion is an important aspect for this site considering the large tidal range and projected sea-level rise in the future. The methodology employed at this site will be used at other sites in the province that are even more susceptible to erosion where glacial till comprises the bank not bedrock.

Contact: Tim Webster,
Research Scientist,
Applied Geomatics Research Group

Impacts of Climate Change on Coastal Communities and Mangrove Ecosystems: Local Vulnerabilities and Local Perceptions

*Tiffanie Rainville and Tony Charles

Abstract:

Coastal communities in developing countries face a variety of stressors from both inland and marine sources, many of which will be exacerbated by climate change. Though global scientific predictions aid in characterizing vulnerabilities at global and national scales, there is a lack of awareness of how impacts have been and will be felt at the local level due to the significant regional differences that exist in terms of geological, social, oceanographic and biological processes. To contribute to the literature on these local implications, this study examined the mangrove ecosystems and coastal zones in two communities in Ecuador: Muisne, Esmeraldas and Portovelo, Manabí. Semi-structured interviews and participatory community 'green mapping' were conducted to glean information about the biophysical changes witnessed in the coastal zone and surrounding estuaries, based on local ecological knowledge as well as the local perceptions of climate change.

Results were compared with information from local organizations, national experts, government and global scientific data (ex. IPCC reports) in order to identify important knowledge gaps and key vulnerabilities. The study also assessed the role of mangrove forests in reducing vulnerabilities and as an adaptation tool at the local level.

Preliminary results indicate that negative impacts seen in freshwater quality and availability, in mangrove health and the livelihoods of subsistence fishermen are of concern locally. However, these changes are attributed to causes other than climate change, as both communities have been severely affected by the shrimp farm industry as well as the El Niño Phenomenon (1997-1998). While the communities have witnessed a variety of climatic changes in the area ranging from rainfall variability to sea level rise, it appears that climate change and its associated vocabulary are not yet fully understood at the local level.

Contact: Tiffanie Rainville,
Graduate Student,
Dalhousie University

The role of current-induced erosion in the recent proliferation of coastal protection structures along Carron Point in New Brunswick

*Dominique Bérubé, Serge Jolicoeur, Stéphane O'Carroll and Marc Desrosiers

Abstract:

Carron Point is a sand spit located at the northeast limit of Bathurst Harbour in New Brunswick. As for its twin spit, Youghall Beach, located on the opposite side of the harbour, Carron Point is highly urbanized with an average of 35 cottages or homes per kilometer of coastline. In the early 2000's, residents from the proximal section of the Carron Point met with representatives from the government to find a solution to their coastal erosion problems. In addition to wave-induced erosion, their section of the spit was affected by current-induced erosion. This latter phenomenon was associated with the migration of the Bass River bar and tidal inlet located just updrift of Carron Point. The same group of residents wanted the government to approve and fund a dredging project that would help them controlling the migration of the bar and inlet. Because no government fund was available at that time for the project, a few residents decided to use traditional coastal protection structures along their property and, unintentionally, initiated a domino effect that resulted in the armouring of over 300 m of coastline. In the mid 2000's, the New Brunswick Department of Natural Resources and Université de Moncton undertook an air photo analysis (CARIS GIS) to document the history of coastline change in the Carron Point area. The analysis showed that the dune line in the proximal section of the spit migrated landward by approximately 7 m between 1985 and 2007, due in large part to the proximity of the Bass River tidal inlet and its erosive currents. The analysis also showed that the same dune line migrated seaward by approximately 14 m between 1939 and 1985, due in large part to the release of a huge amount of sand after the natural destruction of the Bass River bar.

Contact: Dominique Bérubé,
Coastal Geomorphologist,
New Brunswick Department of Natural Resources

Flood-risk Mapping from Storm Surges & Future Sea-level rise in eastern Canada

*Kathryn LeBlanc, Tim Webster and Ian Spooner

Abstract:

It has been determined that the east coast of Canada is highly susceptible to sea-level rise, which means these areas are highly vulnerable to erosion and flooding. The Third Assessment from the Intergovernmental Panel on Climate Change (IPCC) projects an increase of global mean sea-level from 1990 to 2100 to be between 0.09 m and 0.88 m. Due to the high sensitivity of some regions to sea-level rise, it is useful to construct flood-risk maps and determine return periods for present day and future high water levels from storms. Antigonish County, Nova Scotia is located in the southern Gulf of St. Lawrence, along the coast of St. Georges Bay.

The purpose of this project is to look at the extent and impact of various flood levels for the Antigonish county coastline and assign return periods for present day and future sea-level rise conditions from climate change. Some of the tools that will be used to achieve this include; 1) Light Detection And Ranging (LiDAR), 2) Water Modeler, and 3) TuFlow. LiDAR data were collected for the area by the Applied Geomatics Research Group (AGRG) in December 2008. LiDAR is used to build high-resolution digital elevation models (DEMs) as a base within a GIS to be used for the production of inundation maps. The impact of wave runup is still problematic in this methodology and not addressed.

Water Modeler uses a time series of water level records (tide gauge data) to determine the risk associated with high water levels from storm surges and future sea-level rise conditions and generates return periods. TuFlow simulates the complex hydrodynamics of a flood and predicts flood inundation patterns. It predicts the time it will take for water to move across a surface and checks for connectivity between the ocean and low lying areas.

Contact: Kathryn Leblanc,
Acadia University

Vulnerability and Adaptation in Coastal Communities: A Case Study of Historic and Current Adaptation on Change Islands, Newfoundland and Labrador

Maureen Woodrow

Abstract:

This article examines the historic vulnerability on Newfoundland and Labrador coastal fishing communities and the factors that influence adaptation and change in these communities. Through a case study approach Change Islands, a fishing community on the northeast coast is examined. The focus is on adaptation since the moratorium but major historic changes prior to the moratorium are also examined to determine the factors that enhance or detract from adaptation. Government regulatory programs play a large part but other factors such as climate change, the international supply and demand for fishery products, fluctuating Canadian dollar, price of oil as well as the nature of leadership in the community are factors.

Contact: Maureen Woodrow,
University of Ottawa
And Stages and Stores Inc.

Comparative Analysis: Two methods of using Geographic Information Systems to determine community vulnerability to climate change in New Brunswick

W. Reid McLean and *Shawn Dalton

Abstract:

National and provincial effects of climate change have been closely examined, yet there has been little work at the community level, where information is most needed for adaptation planning. The effects of climate change on the New Brunswick environment are known and two important ones are flood scenarios that include storm events and high water in rivers, and drought due to reduced summer precipitation. However, little is known about the ability of local communities to adapt to these events. The University of New Brunswick's Environment and Sustainable Development Research Centre (ESDRC) has developed a method to determine community vulnerability to climate change at a provincial level and intend to apply the same methodology at a local level. This work reports on the efficacy and feasibility of ESDRC's method of determining community vulnerability due to climate change at a local level, assesses an adapted version of the method, compares the results of the two methods, and makes recommendations to strengthen the methodology.

Both methods use publically available census and biophysical data, load them into a geographic information system and calculate local coping range and exposure due to climate change in two New Brunswick cities, to determine the spatial distribution of community vulnerability. Because the data being used would also be accessible throughout Canada, the procedure could be replicated nationally.

This work assesses the relative efficacy of the ESDRC method and its adaptation, which includes a major change for disseminating the census data and creating a grid matrix for showing levels of vulnerability at the local scale. A final recommendation as to which method best shows community vulnerability will enable decision makers at all levels to best plan for and adapt to these future conditions.

Contact: Shawn Dalton, Director,
Environment & Sustainable Development
Research Centre, University of New Brunswick