

Atlantic Coastal Action Program

End of Year Report 2009 – 2010



Bay of Fundy Ecosystem Partnership

BoFEP Secretariat

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ACAP End of Year Progress Report – 09-10

Organization Name: Bay of Fundy Ecosystem Partnership

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Dates Covered by the Report: April 1, 2009 to March 31st, 2010

Submission Date: April 30th, 2009.

1. Briefly describe the activities conducted during the past 12 months (April 2009-March 2010)?

PROJECT 1: *Creating and Using Knowledge about the Bay of Fundy Ecosystem*

[**Note:** Many papers were submitted to the 8th BoFEP Bay of Fundy Science Workshop in May 2009 on research conducted by members of the following WGs. These are reported on below, where appropriate]

Sub project 1 *Biosphere Reserve Working Group (BRWG)*

This working group was active for more than five years. The work of the group is now concluded, having accomplished the goal of substantially contributing to the establishment of the Fundy UNESCO Biosphere Reserve in the north-western part of the upper Bay of Fundy. The Reserve is now the responsibility of other non-government organizations in the Sussex-Moncton-Sackville-Amherst region. BoFEP was acknowledged as being an invaluable source of information for the successful Biosphere Reserve submission to the United Nations (Peter Etheridge, WG Chair, pers.comm.).

Sub project 2 *Corophium and Mudflat Ecology Working Group (CWG)*

The main activity of the working group during this interval was a meeting held in conjunction with the BoFEP Science workshop at Acadia in May 2009. As a result of an NSERC Strategic Grant awarded to Myriam Barbeau, Mark Forbes, Diana Hamilton, and a group of other UNB researchers, there is a large-scale research initiative underway. Dynamics of mudflats are being investigated, with the focus on factors influencing *Corophium* populations and a goal of predicting effects of environmental disturbance on the system. This session served as a meeting of the Strategic team, including all students involved in the project, some of the research partners (e.g. Environment Canada), and other mudflat researchers who commented and provided advice on all aspects of the research.

The *Corophium* Bibliography, a joint initiative of Peter Wells and Diana Hamilton, was also introduced at the meeting. This bibliography contains more than 600 references relevant to mudflat researchers. It is fully searchable and is currently being used by members of the Strategic Grant team. It is maintained by Diana Hamilton's lab, with periodic updates when new

publications become available. We are exploring ways to get this onto the BoFEP website to make it available to all interested users.

The Corophium group continued its research during summer 2009 as members (Barbeau UNB, Hamilton MTA, et al.) have won an NSERC strategic grant to focus intensely on factors affecting Corophium and its ecology. This core funding will support this working group for the foreseeable future.

One long term member, Peter Hicklin, now retired from CWS-EC, is working on papers on two topics: i) the results of 16 years of banding Semi-palmated Sandpipers in the Bay of Fundy; and in collaboration with Marcel David, ii) a paper on the migration of shorebirds in the Acadian Peninsula of New Brunswick based on 12 years of shorebird surveys (conducted by Marcel) in spring and fall at three wetlands in north-eastern New Brunswick. This will be a substantial contribution to our understanding of the use of the Upper Bays mudflats by migratory shorebirds and their reliance on Corophium as a food source.

The annual meeting for mudflat ecology research planning is scheduled for May 20th 2010, at Mount Allison University. This meeting brings together university and government researchers studying various aspects of the ecology of mudflats, from nutrient-diatom-Corophium interactions, to Corophium population ecology, to the population ecology of the migratory shorebirds.

Sub project 3 Eelgrass Working Group (EWG)

In February 2009, the Eelgrass Working Group sponsored a joint meeting of the USEPA New England Eelgrass Working Group and the BoFEP working group. The meeting was hosted by the Gulf of Maine Council on the Marine Environment. The Proceedings from the joint session have been published and are available .

The following letter was received from Dr. Hilary Neckles of Maine DEP in June 2009, along with the Workshop Proceedings:

“On behalf of the organizing committee for the February workshop on Status, Trends, and Conservation of Eelgrass in Atlantic Canada and the Northeastern United States, I extend sincere thanks for the \$2000 CAD donation from the Bay of Fundy Ecosystem Partnership. Your support contributed substantially to the success of the workshop. With the help of BoFEP and other donors we were able to hold the workshop at a comfortable and professional facility while keeping general registration costs low enough to be accessible to all. Your donation helped facilitate communication among people involved in all aspects of eelgrass conservation throughout the region. In particular, the workshop was an opportunity to transfer scientific information to those responsible for and interested in eelgrass protection and management.

A report of the workshop is enclosed, including a summary of the presentations and discussions, the program, and abstracts of presentations. In addition, full workshop presentations are posted on the Gulf of Maine Council website (http://gulfofmaine.org/council/committees/habitat_mon/). There were 117 registrants for the two-day workshop and approximately 100 participants in attendance each day. This represents a sizeable fraction of the people working on eelgrass in the region, including coastal resource managers and decision makers, researchers, members of environmental organizations, consultants,

concerned citizens, and students. Although we did not conduct a formal workshop evaluation, comments from participants were overwhelmingly and uniformly positive and affirmed that the workshop was an effective forum for information exchange.”

BoFEP's Eelgrass Working Group reports that the science advisory report (SAR) on eelgrass entitled "Does Eelgrass (*Zostera Marina*) Meet the Criteria as an Ecologically Significant Species?" has been posted to the website of the Canadian Science Advisory Secretariat (CSAS). It can be viewed at:

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2009/2009_018_e.pdf

Sub project 4 Minas Basin Working Group (MBWG)

The group met in March 2009 and again in October 2009. Members at ACER, Acadia University, are active with research and monitoring associated with tidal power developments and its potential for environmental impacts in Minas Basin. The October 2009 meeting of the MBWG gave an update on the Minas basin Tidal Energy Demonstration Project; members are active on various associated committees, and directly involved in research and monitoring. An update was given on other current Minas Basin Projects (Cornwallis Watershed Project; the Cornwallis River Estuary/Basin Sediment and Vegetation Studies; Southern Bight mudflat infauna diversity; and specific projects dealing with Corophium, lobsters, Atlantic Sturgeon, and striped bass.

A 26 page, March 2009 report entitled "*Development of a series of historical digital mosaics depicting change in intertidal habitat in the Minas Basin*" prepared for the Bay of Fundy Ecosystem Partnership and the Gulf of Maine Council on the Marine Environment by Danika van Proosdij and Peter Horne of St. Mary's University, is available on the BoFEP website at: <http://www.bofep.org/PDFfiles/finalreportmosaicdvpupdated.pdf>.

The purpose of this research project was to assess and integrate all available historical aerial photography into the comprehensive digital geodatabase initiated in 2004. This study focused on the Southern Bight of the Minas Basin and complements on-going initiatives to quantify the changes in ecosystem habitat in the Minas Basin. These mosaics will be used to quantify changes in ecosystem habitat in the Minas Basin and address questions of why and at what rate these changes are occurring in subsequent research.

Members of the MBWG, especially Anna Redden and Jon Percy, were active with both the Program Committee and the Local Organising Committee for the BoFEP Science Workshop in May 2009.

Watching briefs continued on numerous environmental issues in the Minas Basin watershed and the basin itself:

- Tidal Power project – monitoring for potential environmental impacts..
- Windsor causeway expansion.
- Alton natural gas storage.
- Windsor gypsum mine expansion, on the “Avondale” Peninsula near Hantsport.
- Greencover project (Cornwallis River watershed).

- Uranium exploration in the Minas Basin watershed.
- Inner Bay of Fundy salmon – recovery initiatives.
- Striped bass (status: Threatened species).

Sub project 5 *Stress and Cumulative Effects Working Group (SCEWG)*

The focus of the research of this WG is to examine the combined effects of parasitism, chemical contaminants, and physico-chemical factors on wild fish in the Bay of Fundy, especially in areas impacted by salmon aquaculture and/or where new aquaculture initiatives are underway.

Research Study on Combined factors (WG Chair, M.Burt):

The help BoFEP provided earlier this year (The effect of combined stress in aquaculture -\$1,200) helped us to develop a strong NSERC Strategic Grant proposal which, I'm happy to report, was successful resulting in \$443K over the next three years. The BoFEP support was used this summer 2009 to help collect samples from sea cages which were analysed here at UNB. The research showed that the Loma problem is even worse than we envisaged. We are not coming back to BoFEP to help fund this project further as we now have sufficient NSERC funding to support our efforts in this research.

Introduction

Within the past three years, a nematode parasite has been recorded from the swim bladder of eels (*Anguilla rostrata*) in the Atlantic Provinces. The parasite is not endemic to Canada and was first reported from eels in Japan where it is not pathogenic. It was accidentally introduced into Europe and the United Kingdom prior to sowing up in eels in Nova Scotia. Because it is highly pathogenic and can cause serious epidemics, particularly in juvenile fish, it is a serious threat to the developing eel industry in the Maritime Provinces. The parasite, *Anguillicoloides crassum*, lives as an adult in the swim bladder where it attaches to the mucosal lining and feeds on blood. Little is known of the transmission dynamics but preliminary work in our laboratory, and elsewhere, indicates that the larval worms which hatch from the eggs are infectious to a wide variety of crustacean hosts including copepods, amphipods and ostracods. When these are eaten by a variety of small fishes, the larvae infect the fish host and can be carried, without reaching sexual maturity, in a number of “paratenic” hosts. If any of these are eaten by an eel, the nematodes migrate to the swim bladder where they reach maturity, copulate, with the females producing over 1,000 eggs. How the eggs get from the swim bladder to the external environment is not known but may be by way of a small connection between the middle of the swim bladder and the gut.

Project

Our preliminary work this summer 2009 was supported by a NSERC Undergraduate Student Research Award to Rebecca Standen (\$4,500 stipend) and by M. Burt's NSERC Discovery Grant (\$2,500 stipend + \$1,000 travel costs and the cost of purchasing commercial eels). We have limited our project for this year to the Saint John River with a few donated eels from parts of Nova Scotia where similar work is going on by Dr Martha Jones [University of Cape Breton] in collaboration with Dr David Cone [Saint Mary's University]. We would like to extend this work this Fall and into next summer, by collecting eels from those rivers that flow into the Bay of Fundy. Although this worm has not been reported (to my knowledge) from the amphipod

Corophium volutator, the presence of eels on the mudflats at the head of the Bay of Fundy suggests that this is a strong possibility.

A graduate student from Carleton University (Will Shim) is currently working at Mount Allison University, and is looking at the possible effects of parasites on the behaviour of *C. volutator*. He has approached me with a view to collaborating on the eel project as it clearly has implications with his amphipod project. M. Burt has agreed readily to working with him in the Upper Bay of Fundy while continuing with the general survey of rivers flowing into the Bay on the New Brunswick side. The rivers on the Nova Scotia side of the Bay are being surveyed by a graduate student working with Dr Jones and Dr Cone.

Coastal and Land-Based Pollution in the Bay of Fundy

During winter 2010, a problem arose with pesticide (cypermethrin) contamination near the salmon aquaculture sites in the lower Bay, with resulting deaths of hundreds of local lobsters. This created considerable concern about the impacts of chemicals on local fisheries, chemicals coming from both the aquaculture industry as well as from non-point, land-based sources in the various watersheds. The incident stimulated the planning of a workshop, led by M. Burt, to elucidate the facts and put them into perspective. The workshop is “Threats to the Health of the Bay of Fundy” (Potential Problems Caused by Pollutants), April 30th, St. Andrews, NB. Sponsors are BoFEP, Fisheries and Oceans Canada, NSERC, and the New Brunswick Department of Fisheries and Aquaculture. The workshop is organized under the auspices of BoFEPs WG on Cumulative Effects of Stress.

(Note: this workshop was held, with approx 50 people attending; a Proceedings is in preparation and another workshop is being planned for Fall 2010).

Sub project 6 *Sublittoral Ecology and Conservation Working Group* (SLECWG)

Much of the new research conclusions and data compilations have general utility for addressing a variety of issues of interest. BoFEP's distribution channels can very effectively get the word out on these to the broader community around the Bay. We plan to develop an updated poster and/or brochure, branded by BoFEP that would mention several of these recent initiatives (acknowledging the various sources as well as BoFEP's support of the WG).

These outreach products were disseminated at the BOFEP Fundy Science Workshop (May 2009), as well as at the RARGOM Gulf of Maine Ecosystem Science Symposium (Oct 2009). As well, the WG contributed substantially to the Fundy Science Workshop with scientific papers (see the BoFEP website).

Sub project 7 *Eutrophication/Nutrients Working Group* (ENWG)

No report is available.

Sub project 8 *Secretariat support for Project One*

- BoFEP membership records and mailing lists maintained routinely.
- Mailed out of BoFEP materials upon request; also mailings to all members

- Maintained BoFEP information and the document library, including fact sheets, workshop proceedings, publications, and promotional materials (hardcopy and e-copy)
- Since April 1 there have been monthly Management Committee meetings and 1 Steering Committee meeting, for each of which the Secretary prepared and circulated advance materials, set up conference calls, attended and recorded the proceedings, and distributed and maintained the minutes.
- General coordination of BoFEP correspondence.
- Received telephone, fax and e-mail messages to BoFEP, and responded and distributed as appropriate.
- Maintained contact with BoFEP Working Group Chairs.
- Maintained communications with the BoFEP members, in cooperation with the Communications Coordinator.
- Assisted with preparation for and conduct of the 2009 BoFEP Workshop ongoing including sourcing accommodations, facilities and equipment developing preliminary itinerary .

Sub project 9 Communications activities (J.A. Percy)

This core activity of BoFEP consisted of the following work:

(1) Website: Sections of the website have been routinely updated as required. Many new pages were created and posted with up-to-date information about the 8th Bay of Fundy Workshop, including details of programs, guidelines for presenters, schedules, registration material etc. Following the Workshop, the website was extensively revised to remove obsolete workshop material (registration, programs etc) and to add new material generated at the workshop (award winner pictures and write ups, updates on Proceedings preparation etc.). The Proceedings of the 8th Workshop have also been completed and posted on the website. The new Fundy Issue number 30 has also been posted on the website. The Fundy Issues index page was revised so that the various Issues are arranged thematically rather than simply chronologically. An online calendar of BoFEP/Fundy events was regularly updated. A variety of web-based mail lists used in support of networking amongst members of BoFEP committees and working groups were maintained and routinely updated. Relevant publications, reports and articles (e.g. Proceedings of recent Eelgrass Workshop sponsored by the Eelgrass Working Group) were routinely posted to the Website as well as news items general interest to the broader Fundy community. A complete listing of these additions is tabulated in the “What’s New” page on the BoFEP Website (www.bofep.org/whatnew.htm). A minor security breach of the website was reported; this was effectively corrected with assistance from the web hosting service. A wide range of questions sent in by visitors to the Website were responded to in a timely maner. Search query terms used by Website visitors were routinely monitored, providing useful information to ascertain the main interests of visitors in order to tailor the Website more closely to their information needs. Work is underway on developing a new website format to make it more even user-friendly and aesthetically appealing.

(2) Newsletter: Issues of the Fundy Tidings e-newsletter were prepared and circulated in August 2009, November 2009 and April 2010. A new and improved layout has been developed for the newsletter and a new maillist program [*Maillist Controller*] has been acquired to maintain the mailing list of approximately 500 addresses and to customise the layout and distribute the newsletters and other BoFEP mailouts. The newsletter regularly features timely information in three major categories: firstly matters pertaining directly to BoFEP and its committees and working groups; secondly, relevant news about BoFEP partners and other Fundy organizations; and thirdly, general information about the Bay of Fundy and Gulf of Maine regions that may be of interest to members. The response to the newsletter has been extremely positive. Copies of all the newsletters are archived online at: <http://www.bofep.org/tidings.htm> . The summer 2010 issue of the newsletter is presently being compiled and will be circulated in mid July.

(3) Fundy Issue: Fundy Issue # 30, “Tweaking Tidal Technology: Harnessing the Bay of Fundy Tides” was completed, published and circulated to members and other interested individuals. It has also been posted on the BoFEP website. Fundy Issue #31 dealing with the geology and fossil riches of Fundy is presently in preparation with the much appreciated assistance of individuals at the Joggins Fossil Cliffs Centre. A proposal is being developed to prepare a comprehensive Fundy overview book, drawing upon the large amount of material contained in the Fundy Issues produced thus far. This might provide an additional modest source of income for BoFEP.

(4) 8th BoFEP Bay of Fundy Science Workshop:

The 2009 Science Workshop, held 26-29 May, 2009 at Acadia University, was supported by 18 partners and sponsors and attracted 184 participants representing government agencies, industry, NGOs, universities, and the broader Bay of Fundy community. This year, we saw the participation of numerous high school students, including local co-op students and those who travelled from afar – 11 from Essex Agricultural and Technical High School in Danvers, Massachusetts, and 3 from the L’Itkuk Environment, Bear River First Nations. A total of 69 papers and 26 posters were presented in 14 scientific sessions. Three plenary talks pertaining to the Workshop themes were also given. Plenary speakers were Gordon Fader (Atlantic Marine Geological Consulting Ltd), Michael Stokesbury (Ocean Tracking Network, Dalhousie University), and Rob Thompson (Parks Canada).

Many BoFEP members participated actively in all aspects of planning and preparation of the 8th Bay of Fundy Science Workshop. Over 100 abstracts were submitted, acknowledged and processed. These were organized into tentative workshop sessions and prepared and published a comprehensive abstract book. Preliminary and final program books for the workshop were prepared, laid out and published (in print and online). Several posters and a variety of other advertising material pertaining to the workshop were developed and circulated widely. Paper and online versions of registration forms and guidelines for paper and poster presenters were prepared and circulated widely. A comprehensive Workshop Proceedings document was prepared, edited and published in a CD format: [A. M. Redden, J. A. Percy, P. G. Wells, and S. J. Rolston (Eds). 2009. *Resource Development and its Implications in the Bay of Fundy and Gulf of Maine. Proceedings of the 8th BoFEP Bay of Fundy Science Workshop, Acadia University, Wolfville, Nova Scotia, 26–29th May 2009*. Bay of Fundy Ecosystem Partnership Technical Report No. 4. Bay of Fundy Ecosystem Partnership, Wolfville, NS. 392] The Proceedings document was also posted on the BoFEP Website. Information and photos of the winners of the various awards presented at the workshop were also posted on the website (see details below).

(4.1) Workshop Awards

Student award winners at BoFEP Workshop

Competition was stiff for the awards for best student papers and posters presented at the 8th Bay of Fundy Science Workshop held in May at Acadia University. A total of 14 papers and 12 posters were in the running. This year, first and second place awards were presented separately, to graduate and undergraduate students for their papers and posters, to make the competition a bit fairer. The submissions were of exceptionally high quality and judges were hard-pressed to select winners..... all the students deserve hearty congratulations for their efforts. Winners received a book and a certificate, as well as a cheque for \$100 for first place and \$50 for second place. Papers dealing with the burrowing amphipod *Corophium*, and students from New Brunswick universities, captured the lion's share of the awards. Mount Allison University lauded its four winners in an article (with photo) in its online newsletter available at:

<http://www.mta.ca/news/index.php?id=2044#2044>

The complete list of award winners and their paper/poster titles are posted at:

www.bofep.org/workshop2009.htm

(4.2) BoFEP 2009 Stewardship Award

One of North America's leading specialists on North Atlantic Right Whales, Dr. Moira Brown, was honoured at the 8th BoFEP Bay of Fundy Science Workshop held from May 26-28th at Acadia University. Dr. Brown, currently a senior right whale scientist with the New England Aquarium and the Canadian Whale Institute, has dedicated her career to saving the North Atlantic Right whale in Canadian waters. The biennial Bay of Fundy Stewardship Award is presented by the Bay of Fundy Ecosystem Partnership (BoFEP) to an individual who *has "contributed significantly to the environmental health/sustainability of the Bay of Fundy"*.

Dr. Brown has not only increased our knowledge of Right Whale biology and ecology through her innovative and wide-ranging research, but has also played a major role in the development of the federal government's Right Whale Recovery Plan (2000) and the more recent Recovery Strategy for the North Atlantic Right Whale (*Eubalaena glacialis*) in Atlantic Canadian Waters. Her research and informed counsel led to the moving of the shipping lanes in the Bay of Fundy in 2003, thereby reducing the potential for a ship striking a right whale by 90 %. Her efforts also contributed to the designation in 2008 of a seasonal and voluntary "Area to be Avoided" on Roseway Basin on the Scotian Shelf (another critical Right Whale habitat). The latter ruling affects all vessels of 300 gross tonnage and upwards, with the exception of fishing vessels. Dr. Brown and Dalhousie researchers Angelia Vanderlaan and Chris Taggart used decades of Right Whale sighting data, coupled with vessel transit data, to provide the information that enabled Transport Canada to convince the International Maritime Organization (IMO) to adopt significant conservation measures to reduce the risk of vessel strikes for Right Whales in Atlantic Canadian waters.

Dr. Brown's conservation efforts and research have also recognized the need to understand and appreciate the effects that her research, and the decisions based on it, has on all stakeholders involved around the Bay. As a result, she has developed a unique relationship with the marine communities (fishing, shipping and whale watching) that share the waters of Atlantic Canada with these threatened whales. By working closely with, and making her research available to, these communities Dr. Brown has directly and indirectly promoted the ecological integrity,

vitality, biodiversity and productivity of the Bay which has led to enhancing communication and cooperation throughout communities in the Bay.

(4.3) BoFEP Special Community Service Award

At its workshop banquet on Thursday, 28th May 2009, George Baker of Kentville, Nova Scotia was presented with a BoFEP Special Community Service Award in recognition of his “inspired leadership” on the tidal power issue. In addition, The 2009 Workshop Proceedings was dedicated to him, to record our respect and appreciation for his contributions to the understanding of the environmental implications of tidal power generation from the Bay of Fundy. It was at George Baker’s recommendation that we convened the first broad examination of the environmental implications of Fundy tidal power at Acadia University in 1976. That led to the creation of the Fundy Environmental Studies Committee (1977–1984), which oversaw the first multidisciplinary, multi-institutional study of the whole Bay of Fundy, and substantially increased our knowledge of that rich and diverse ecosystem.

(4.4) Community Forum at the 8th Bay of Fundy Workshop

A Community Forum on Industrial Development in the Bay of Fundy region was held in the morning of May 26th. Led by Arthur Bull, a network of about 30 community members and representatives of a range of organizations convened in Wolfville to consider the implications of present and future industrial developments on the well-being of Fundy’s coastal communities. In the afternoon, the group focused on using available community media as a means of mobilizing citizens around industrial development issues, with a panel of community-based film makers and a presentation on community media. At the meeting, there was also the screening of some short videos, including Sara Bood’s film about Saint John. .

(4.5) Public Forum on Tidal Energy Demonstration Project

During the Workshop, immediately following the day-long session on Tidal Power, an evening Forum was convened in the Atlantic Theatre Festival to which workshop participants and the general public were invited. At the well-attended Forum, Minas Basin Pulp & Power on behalf of FORCE (*Fundy Ocean Research Centre for Energy*) provided an update on the Proposed Project that included presentations by engineers and scientists (John Woods, Minas Basin Pulp & Power; Gordon Fader, Atlantic Marine Geological Consulting; Patrick Stewart, EnviroSphere; and Russell Dmytriw, AECOM) about the environment in the Minas Passage, followed by a Question and Answer session.

(5) Review Committee for BoFEP funding support

A review panel was created to assess project proposals submitted by Working Groups and their partners for consideration for funding by BoFEP. Four proposals were submitted and after careful review, three were approved for funding. These included:

(5.1) *Continued Development and Application of the Bay of Fundy Information Collaboratory: Identifying Priority Requirements for the Information System with Particular Reference to Managers of Integrated Coastal and Ocean Management (ICOM).* [Fundy Informatics Working Group]

(5.2) *The interaction of the eel swimbladder nematode and Corophium volutator.* [Stress and Cumulative Effects Working Group]

(5.3) *Engaging Municipalities in Wetland Conservation and Coastal Planning.* [Salt Marsh and Restricted Tidal Systems Working Group and Ecology Action Centre]

Details of these proposals and the status of the work being done is included under the sections describing the activities of the specific working groups.

(6) Miscellaneous communications activities:

The communications coordinator participated in community consultation forum on tidal energy in Cornwallis Park (Digby area) on May 7th 2009. He participated in all Management Committee meetings and conference calls as well as Steering Committee meetings and Minas Basin Working Group meetings. BoFEP Display units were updated as required and set up at the BoFEP Workshop and various other events (e.g. the RARGOM Conference, Oct 2009; the Fundy Pollution Workshop, April 2010).

PROJECT 2: Using Knowledge on the Bay of Fundy Coastal Ecosystem - a Multi-year, Multi-partner Approach to Current Issues

[Note: Four of the working groups continue to be engaged in projects pertaining to using and disseminating ecological and environmental knowledge about the Bay of Fundy. A number of papers were submitted to the 8th Bay of Fundy Science Workshop on research conducted by members of the following WGs. There were also focused sessions on some of the topics e.g. marine energy, mudflat ecology, informatics, contaminants, as in previous years, in keeping with the workshops theme.]

Sub project 1 Fundy Informatics Working Group (FIWG):

A pilot version of the "BoFEP Informatics Collaboratory Project" being developed by BoFEP's Fundy Informatics Working Group is available on the Dalhousie website. This handy tool facilitates access (by searching or browsing authors, titles, subject categories or keywords) to the wide range of publications included in the Cumulative Index to BoFEP Publications prepared by S.J. Rolston and P. G. Wells (March 2006), including Workshop Proceedings, Fundy Issues and other BoFEP Reports. Most items are available in both html and pdf formats. The site can be found at: <http://docs.informatics.management.dal.ca/bofep/>, as well as on the BoFEP website.

A research proposal has been prepared and submitted for funding to extend the work on the Collaboratory. This proposal is entitled: Continued Development and Application of the Bay of Fundy Information Collaboratory - Identifying Priority Requirements for the Information System with Particular Reference to Managers of Integrated Coastal and Ocean Management (ICOM).

The *Fundy Information Collaboratory* was conceived by FIG as a means of providing centralized access to the resources that deal with the Bay of Fundy. The small prototype, described above, was demonstrated at a BoFEP Bay of Fundy Science Workshop in 2006 and has been in operation ever since for access to primarily BoFEP publications. Built with a rich exploration menu structure, as well as search capability, the prototype demonstrated its value and continues to do so.

Two initiatives occurred almost simultaneously this past year in support of continued development of the Collaboratory. First, to make significant advances with the Collaboratory concept, we knew that additional information was needed regarding how people use this sort of information for making informed decisions. What we needed were some definitive “use” cases. Because the ACZISC (Atlantic Coastal Zone Information Steering Committee) and the GOMC (Gulf of Maine Council on the Marine Environment) had already completed nearly 20 reports of surveys and workshops, we analyze those reports to assess whether we could develop use cases from the contents. That task is complete, and the results suggest that selected geographic data elements can be extracted but good instances of how those elements will be used are not included. Thus, our next stage is to conduct interviews on use with environmental decision makers. Second, E. Toms became a network investigator on a National Centres of Excellence (NCE) project, GRAND. One of the 32 projects that is being funded under the NCE is nGAIA, Next Generation Information Appliances, of which Toms is the primary investigator. BoFEP, COINAtlantic and ACZISC are project supporters. The plan under this project is to develop a system that supports environmental decision making for the Bay of Fundy. Thus, we have been able to leverage the initial support from BoFEP into a much larger initiative.

During the year, members organized a special paper session on Information Management at the 8th BoFEP Science Workshop, as well as a poster session. Both proved successful and attracted a lot of attendees and discussion

Work of other members continues. Research through the SSHRC funded study has continued, with one sub-project strengthening the data base on and analysis of GOMC publications, which have direct relevance to the Bay of Fundy. Numerous talks and publications have come from this work to date (see www.eiui.ca). As well, working linkages have been made to ACZISC and COINAtlantic, and these groups have contributed to the research proposal mentioned above.

Sub project 2 Salt Marsh and Restricted Tidal Systems (SMaRTS) Working Group:

A number of WG members attended at the BoFEP Science Workshop that was held in May at Acadia University, NS. One of the afternoon sessions was dedicated entirely to salt marsh related activities and the audience heard a number of excellent restoration and research presentations. Several posters highlighting ongoing activities of WG members were also on display throughout the event.

A SMaRTS WG meeting was held during the Science Workshop, immediately following the salt marsh presentation session. This meeting was well attended and much of the focus was on providing updates on research, restoration and monitoring activities over the previous year and on planned/anticipated projects for the coming field season.

A good portion of the discussion focused on two dyke breaching projects (St. Croix River, Aulac Marsh); DFO’s new Restoration Database; and on the need for not just compensation type restoration projects but that we need to also be supporting and engaging in pro-active “net-gain” type restoration projects. It was acknowledged that since 2005, nearly a dozen intentional salt marsh restoration projects, complete with some level of pre- and post-monitoring, have been undertaken in the Bay of Fundy and that the majority of these were or are compensation projects. A lot has been learned from these projects about the natural form and

function of coastal wetlands and their response to restoration activities, but that the inclusion of long-term monitoring programs in restoration projects continues to be vital to the determination of individual project success but also in better guiding the design and management of future projects.

A new paper on salt marsh restoration, based on the extensive studies at Cheverie Creek, NS, has just been published in the journal *Restoration Ecology* (Bowron, T. et al., 2009, Macro-tidal salt marsh ecosystem response to culvert expansion).

A new project was started in late 2009 by the Ecology Action Centre. Their report follows:

The Ecology Action Centre received \$5000 from BoFEP for a project called “Engaging Municipalities in Wetland Conservation and Coastal Planning”. This project will enhance the knowledge and capacity of municipalities to adapt to climate change through improved coastal management, with a particular focus on wetland conservation and restoration. The original project plan was to conduct four to six presentations to municipal councils and planning advisory committees around the Bay of Fundy, as well as to develop resource materials on coastal management and climate change adaptation. Additional funding was leveraged from Mountain Equipment Coop Foundation, allowing more presentations to be made in municipalities around Nova Scotia. This allowed the project to hire a contract researcher, Robin Musselman, to help prepare presentations and resource materials and coordinate the scheduling of presentations.

We started work on this project in mid-February 2010. All rural municipalities and districts in Nova Scotia received a letter asking if they are interested in the presentation and resource material. The presentation was prepared and piloted in March 2009. Presentations have now been scheduled fairly regularly for April, May and June 2010. The power point presentation was developed with feedback from staff at Department of Natural Resources, as well as three members of the SMARTS working group (Dr. Danika Von Proosdij, Tony Bowron, and Dr. Bob Pett).

The presentations we have completed so far:

Municipality of West Hants (Bay of Fundy)

Municipality of the District of Queens (South Shore)

Town of Lockeport (South shore)

Upcoming presentations are:

Municipality of the District of Lunenburg (South Shore)

Municipality of the District of Shelburne (Gulf of Maine)

Town of Barrington (Gulf of Maine)

Municipality of the District of Kings (Bay of Fundy/Minas Basin)

Municipality of East Hants (Bay of Fundy/Minas Basin)

Town of Pictou (Northumberland Strait)

Next steps

Now that a solid presentation exists, and is being put up on our website, the next step is to finalize the resource material. We are preparing fact sheets on the topics covered in the

presentation, which will provide expanded information and resources. This will be sent to all the councils that received our presentation, and also be distributed electronically on our website.

Sub project 3 Outreach Working Group (OWG)

BoFEP is at a pivotal point in its history due to the many issues facing the Bay of Fundy and the challenges facing BoFEP as an organization, especially continued funding of our work. This group has met regularly in St. Andrews, NB, and has built upon the four background papers prepared in 2006-09 to help guide BoFEP in the next few years. The WGs' mandate is to explore various options for moving BoFEP forward with suitable core and project funding (hence its original name of strategic development and funding WG), and to focus on specific projects of a multi-partner nature.

There was a special BoFEP Steering Committee (SC) Meeting on March 26, 2009, at Mount Allison University, to discuss these challenges and our suggested approach to them.

At the meeting, the primary results of recent Outreach Working Group retreats were presented. The focus has been on ways to strengthen BoFEP. Following initial discussions, there were round table discussions on components of a strategy to renew and strengthen BoFEP. The focus was on three major topics - marketing BoFEP and its products; diversifying funding of our operations; and engaging and strengthening the role of the Steering Committee. This has led to a documented proposal "BoFEP Into the Future", highlights of which were presented at the 8th BoFEP Bay of Fundy Science Workshop in May.

The Outreach WG organized and held a special session on Conservation at the 8th BoFEP Workshop in May 2009, with BoFEP members and others. This was very well attended and is reported on in the Workshop Proceedings.

A further Outreach meeting was held Aug 14th, in Sackville, NB. The agenda covered new funding sources, the process of finding those sources, and ways to conduct a more streamlined organization. The CD copy of the document identifying industry/business/associations around the Bay of Fundy, prepared under contract recently for BoFEP, was distributed and discussed.

An article on the BoFEP 2008 AGM appeared in the most recent issue of Netawek Ikjikum (Voice of the Ocean) the Quarterly Newsletter of the Maritime Aboriginal Aquatic Resources Secretariat (MAARS).

Outreach Working Group Final Report on 2009-10 Activities

The Outreach Working Group focused on two topics over the past year: breaking the Western/Aboriginal cultural divide by initiating Talking Circles on Conservation; and assessing the options and strategies for the continued operation of BoFEP.

The second in the series of Talking Circles was held in November, 2009, in St. Andrews in cooperation with the Passamaquoddy First Nation, with 16 people present. Contributions from the Southern Gulf Coalition, the Passamaquoddy Nation and the Coastal Livelihood Trust to assist in the events were greatly appreciated. A follow-up to the Talking Circle will take place as BoFEP and the Passamaquoddy Nation organize a workshop at CZC 2010 to review Western

concepts of conservation and the Aboriginal early governance structure and how it influenced life approaches.

Outreach member, Owen Washburn prepared an Options paper for the BoFEP Management and Steering Committee in early spring of 2009 which identified the pros and cons of various organizational structures and their financial implications for the future of the organization. Management discussed these and provided the document to Steering Committee for comment. The Outreach Committee collected responses and provided a discussion document indicating member preferences. This was also the topic of a February Special Meeting of BoFEP where it was decided to utilize the expertise of member Peter Etheridge to facilitate the development of a strategic plan for BoFEP based on the Options paper. The Strategic Planning session, a special meeting of the Outreach Working Group, occurred in April of 2010 and there will be subsequent meetings as the process culminates in a plan.

Sub project 4 Marine Energy Working Group (MEWG)

A strong session on tidal energy was part of the 8th Science Workshop. Members also participated in an evening Fundy Tidal Power meeting in Wolfville, July 8th, to discuss the implications of tidal power on the Fundy environment. Members of BoFEP are involved with various committees and research projects dealing with the assessment of Minas Basin before, during and after the demonstration units are deployed (see Minas Basin WG report, above).

Subproject 5 Program Committee 8th Science Workshop

The Workshop was successfully conducted and the Proceedings are published, distributed, and available on the BoFEP website.

Subproject 6 Communications Coordinator

Please see report above, under project One.

Subproject 7 Secretariat (April 1, 2009 – March 31, 2010)

The following activities were carried out by the Secretariat, in support of all of the activities of BoFEP:

- BoFEP membership records and mailing lists maintained.
- Mailed out of BoFEP materials upon request.
- Maintained BoFEP information and the document library, including fact sheets, workshop proceedings, publications, and promotional materials (hardcopy and e-copy).
- Since April 1st, there have been 11 Management Committee meetings (July 7, July 28, and Aug 13, Oct 20, Nov 4, Nov 24, Dec 9, Jan 5, Jan 19, Feb 9, Mar 9) and 1 Outreach Committee meeting (Aug 13) and the AGM (Nov 4) which the Secretary attended and recorded, distributed and maintained the minutes for. Please note that the SC was included in the Aug 13th Outreach Committee Meeting and the Nov 4th AGM.
- General coordination of BoFEP correspondence.
- Received telephone, fax and e-mail messages to BoFEP, and responded and distributed as appropriate.
- Maintained contact with BoFEP Working Group Chairs.

- Maintained communications with the BoFEP members, in cooperation with the Communications Coordinator.
- Workshop preparation and participation for the 2009 BoFEP Workshop including the following:
 - Registration processing, records and correspondence.
 - Manning of the registration desk.
 - Financial records, invoicing, billing, and maintenance of files.
 - Correspondence with attendees and sponsors.
 - Other organizational requirements from the Director of the host (Acadia Centre for Estuarine Research).

2. Project Status

Identify whether each project is *Ahead of Schedule*, *On Schedule* or *Behind Schedule*. If ahead or behind schedule, provide an explanation.

PROJECT 1:

Sub project 1 *Biosphere Reserve Working Group (BRWG)*

This WG is now disbanded.

Sub project 2 *Corophium and Mudflat Ecology Working Group (CWG)*

This project's field ecological research is on schedule. The Bibliography is completed and will shortly be placed onto the website.

Sub project 3 *Eelgrass Working Group (EWG)*

The WG has published the Eelgrass Workshop proceedings, and all other work is on schedule.

Sub project 4 *Minas Basin Working Group (MBWG)*

This WG is inactive, as of Dec. 2009.

Sub project 5 *Stress and Cumulative Effects Working Group (SCEWG)*

Work of the WG is on schedule.

Sub project 6 *Sublittoral Ecology and Conservation Working Group (SLECWG)*

Research by members of this WG, facilitated by BoFEPs support, is on schedule.

Sub project 7 *Eutrophication/Nutrients Working Group (ENWG)*

This WG is inactive.

Sub project 8 *Secretariat support*

On schedule (*see above*).

Sub project 9 *Communications support*

On schedule (*see above*).

PROJECT 2:

Sub project 1 *Fundy Informatics Working Group (FIWG)*:

Work on the Fundy Information Collaboratory is on schedule.

Sub project 2 *Salt Marsh and Restricted Tidal Systems (SMaRTS) Working*

Group:

Work by members is ongoing and generally on schedule, with a WG meeting planned for this Fall-winter period.

Sub project 3 *Outreach Working Group (OWG)*

Work is on schedule, with frequent meetings discussing new projects that will assist BoFEP funding. A second Conservation Forum took place in November 2009..

Sub project 4 Marine Energy Working Group (MEWG)

This WG is inactive.

Sub project 5 Workshop Program Committee

The 8th Workshop was completed successfully.

Subproject 6. Communications Coordination

On schedule.

- 3. What problems have been encountered in relation to the projects to be carried out? Provide a brief account of the nature of the problem, its origin, the solutions tried or being considered, and implications for the project. Would an amendment to the Contribution Agreement be appropriate at this time?**

PROJECTS ONE AND TWO

The primary problem, as in last FY, was one of the delayed funding hampering our ability to fund WG activities in the summer months when researchers and students are available for many of the projects.

- 4. What successes have you achieved in relation to the projects carried out? Provide the name of the project, a brief account of the nature of the success and implications for the project or your organization.**

PROJECT 1:

Sub project 1 Biosphere Reserve Working Group (BRWG)

- Increased recognition of the Fundy Biosphere Reserve by the public, visitors to the region, and especially Parks Canada.
- Greater involvement and support of Parks Canada in BoFEP activities. Major talk given by Parks Canada at the 8th workshop on marine conservation areas.
- Due to the group's success and the Biosphere Reserve having been set into place, the WG is now disbanded.

Sub project 2 Corophium and Mudflat Ecology Working Group (CWG)

- Researchers in the WG have been awarded an NSERC Strategic Grant to continue the research started by members of the group. This points to the success of BoFEP as a facilitator of new research on Fundy issues of concern.
- A very successful and well attended session was held at the 8th Workshop to coordinate the many research activities of this WG.
- A research meeting is planned for May 2010.

Subproject 3 Eelgrass WG (EWG)

- The group has acted as a focal point for research initiatives on eelgrass across the Gulf of Maine-Bay of Fundy ecosystem. A successful workshop and publication has led to further research studies on eelgrass well coordinated across the region.

Sub project 4 Minas Basin Working Group (MBWG)

- The group continues to act as a focal point for discussions of the implications of tidal power development in the Minas Basin region. BoFEP members are

consulted frequently on environmental questions pertaining to this energy sector. BoFEP publications on the Bay of Fundy are used widely in association with the tidal power development project..

Sub project 5 *Stress and Cumulative Effects Working Group (SCEWG)*

- BoFEP has assisted with facilitating continued funding of research, through NSERC, on the interacting factors (physicochemical, contaminants, parasites) contributing to cumulative effects and change in coastal species of the Passamaquoddy Bay region.
- WG members have built a considerable knowledge base on the interactive effects of mercury and parasites on Corophium and their shorebird predators.
- A pollution workshop was organized for April 2010. (This has been held and a Proceedings are in preparation).

Sub project 5 *Sublittoral Ecology and Conservation Working Group (SLECWG)*

- BoFEP has greatly facilitated work on the biodiversity of benthic species in the lower Bay of Fundy. This work was reported on at the 8th Fundy Workshop, as well as at the recent RARGOM Gulf of Maine Ecosystem Science Symposium.

Subproject 7 *Eutrophication/Nutrients Working Group (ENWG)*

- The WG is not active as such but one of its members, T. Chopin, is active.
- A paper was given at the GOM Symposium on research on a multi-trophic approach to nutrient reduction near salmon aquaculture facilities.

Sub project 8 *Secretariat support*

- BoFEP continues to operate smoothly.

Sub project 9 *Communications support*

- The BoFEP web site is a recognized source of and guide to reliable scientific information on the Bay of Fundy.
- The Fundy fact sheets are used widely, especially in schools and at the Fundy National Park, Alma, NB
- A new Fundy Fact Sheet, No 30 on tidal power, was completed and was distributed with interest at the recent RARGOM GOM Symposium.

PROJECT 2:

Sub project 1 *Fundy Informatics Working Group (FIWG):*

- The prototype Fundy Information Collaboratory is a valuable guide to some of the most recent information from BoFEP on the Bay of Fundy. It was used during the SEA process both in NS and NB.
- WG members have been successful at acquiring SSHRC funding to support further studies on the influence of grey literature in the environmental field on policy and decision making. This research, now in its 3rd year, has generated over 15 papers, posters, talks and other presentations, and its students continue to be recognized.
- The group is acting as a focal point for members interested in enhancing the value of scientific knowledge on the Bay of Fundy regarding its efficient access through current search engines.

Sub project 2 *Salt Marsh and Restricted Tidal Systems (SMaRTS) WG:*

This Working Group regularly brings together a diverse array of people and groups involved in salt marsh research, conservation and restoration. It has served as a catalyst for a range of different projects and is an important networking tool in this field. A major new paper was published on the Cheverie Creek NS salt marsh restoration study.

Sub project 3 Outreach Working Group (OWG)

- The group has supported BoFEP being a sponsor and organizer of Forums on particular topics of special interest (Tidal Power; Conservation). The WG continues to plan for the future through a new completed compendium of possible industrial partners in the Fundy region, and making use of the many recommendations coming from its strategic development meetings over the past 3 years. It has engaged the First Nations directly in the Conservation meetings, and in the theme of the current BoFEP project 2009-10.

Sub project 4 Marine Energy Working Group (MEWG)

- A successful set of talks was given at the 8th Workshop. BoFEP has several WGs keeping a watching brief on tidal power, as well as generating new research on its potential environmental impacts. The group is now inactive.

- 5. List any variations from the original project proposal that were either encountered or are anticipated to change before the end of the fiscal year. What are the reasons for these changes? (Please note that the ACAP office must approve any changes to the projects within the contribution agreement). Amendments will follow upon request.**

PROJECT 1: NONE.

PROJECT 2: NONE.