BAY OF FUNDY ECOSYSTEM PARTNERSHIP

Report to the 2004 Gulf of Maine Summit on The 6th Bay of Fundy workshop

The 6th Bay of Fundy Workshop was held from September 29th to October 2nd, 2004 at the Annapolis Basin Conference Centre, Cornwallis Park, Nova Scotia. The Workshop attracted 165 participants from around the Bay of Fundy and the northern Gulf of Maine, including a large contingent of young researchers competing for awards for the best student papers and posters presented at the workshop.

The years 2004-2005 mark the 400th anniversary of the arrival of French colonists in the Bay of Fundy and the establishment upon its shores of their fortified Habitation at Port Royal, the first enduring European settlement in Canada. In the 400 years since, there have been profound changes in the Bay's ecosystems, in the abundance and diversity of its natural resources and in the nature of the human communities along its coasts.

Thus, on this significant anniversary it seemed particularly timely for us to consider what has happened to the Bay over these four centuries, reflect upon its present condition and discuss what needs be done to ensure continued ecological integrity and productivity of this unique ecosystem during the centuries to come. Fittingly, the Workshop theme was "The Changing Bay of Fundy - Beyond 400 Years". Appropriately, it was held in a new conference centre located just across the Annapolis Basin from the defensive embrasures of the reconstructed Habitation at Port Royal.

PLENARY PRESENTATIONS AND SCIENTIFIC SESSIONS

In keeping with the theme, on each of the three days an opening plenary presentation focused on the past, present and future, respectively. These presentations comprised:

- *"Early Perspectives on the Fundy Environment"* by Heather MacLeod, St. Mary's University, Halifax.
- *"The Bay of Fundy at a Turning Point"* by Arthur Bull, Saltwater Network.
- *"Challenges for Ocean Science and Ocean Management"*, by Art Hanson, International Institute for Sustainable Development, Winnipeg.

A total of 68 papers and 28 posters (a record number of submissions for BoFEP Workshops) were presented during the workshop in the following eleven scientific sessions:

1. Contaminants and ecosystem health
2. Ecology of seabirds and shorebirds
3. Coastal development and sediment flux
4. Sustainable use and management of the Bay of Fundy
5. Science, mapping and information management
6. Fish, fisheries and aquaculture

7. Protecting special places
8. Monitoring environmental impacts in coastal areas
9. Coastal habitat - eelgrass and salt marsh
10. Ecosystem modeling in a macrotidal estuary - Cobscook Bay
11. Dedicated poster session

ROUND TABLES

Following the future-oriented plenary session on the final morning of the workshop, the participants formed three round tables to discuss the future of the Bay of Fundy in relation to:

- The Health of the Bay
- The Management of the Bay and its Resources
- The Coastal Communities of the Bay

The ensuing discussions were thought provoking and animated. However, in the short time available it was only possible to focus on a limited number of facets of each of these broad topics. Nevertheless, a number of very interesting points were explored by each group and presented in the final plenary session. These discussions can be summarized as follows:

1. The Health of the Bay Round Table

Our initial intention was to identify two or three of the most critical concerns pertaining to marine environmental health in the Bay of Fundy as foci for further discussion. However, we found it impossible to select a small number that we could all agree on and instead created a shopping-list of issues that were considered important by various people in the group. The most critical concerns raised, in no particular order of priority, included the following:

- reduction in biodiversity
- introduction of invasive species
- intertidal harvesting and the resulting habitat disturbance
- presence of a variety of contaminants in water, sediments and biota
- biological effects of low levels of contaminants
- climate change consequences
- water quality concerns, particularly in relation to sewage and heavy metals.
- environmental impacts of physical barriers (dams and causeways) on rivers
- environmental impacts of habitat restoration efforts (such as causeway removal or dyke breaching)

Next we addressed the question of what useful techniques are available to assess changes in ecosystem health associated with any of the above issues. It was noted that many innovative techniques had been described in the various papers and posters presented during this workshop. A number of concerns were raised. There is a need to clearly define biodiversity in the Bay of Fundy context in order to be able to develop effective programs to monitor this critical indicator of overall ecosystem health. There is also a need to understand the functioning and ecological importance of salt marshes in a broader context, particularly in relation to the marine productivity

of the Bay. It is important to develop effective ways for measuring and monitoring the short and long-term impacts of human activities, such as resource harvesting (rockweed, clams, baitworms etc.) in the intertidal zone. The use of molluscs in environmental assessments should be carefully considered.

There are a number of gaps in our knowledge that need to be addressed in order to develop effective ways of assessing and monitoring the state of the Bay. We need to develop a regionally appropriate suite of marine environmental quality criteria, particularly a comprehensive set of guidelines that include both biotic and environmental components. The more important biological, chemical and physical interactions occurring within the Bay's ecosystem need to be much better understood - we need to better understand how the system works. There is also a special need to identify a number of sensitive indicators that will provide an early warning of a general deterioration in ecosystem health. However, it is clear that there is no universal or cookie-cutter approach to the many problems confronting the Bay - there have to be specific approaches developed for dealing with each of the principal environmental health issues.

There was general agreement that it would be worthwhile to expand the terms of reference of the existing BoFEP Contaminants Working Group to further explore many of the ideas raised by the round table and to seek creative ways of addressing some of the important issues identified.

2. The Management of the Bay and its Resources Round Table

A. Data collection, sharing and management

- ***Data Sharing*.** Data can serve multiple purposes but generally doesn't because it's not in the organization's mission or mandate to use it or make it available for other purposes. Indeed, the mandates of organizations often don't allow sharing of information or data. How are we to co-share information if it's not in the mandate of the organization that collected the data? Who funds it? How do you release mapping and other data considering ownership issues? There is a need for protocols on information sharing and decision-making. Also, co-sharing information, and management, is often an issue of leadership.

- ***Communication.*** How do we communicate the information to others? To different user groups? How do we get information to people on time (e.g. emergency measures)? Data is not available to all … the data needs to be processed and the information made available to all. The need for data processing is a strong argument in support of IM. Protocols could be developed that address the need for data processing.

- ***Use of the information*.** The user base of data and information broadens over time, as different community and other groups are enabled to access data in a useable form. This increases the sophistication of the questions. Need to be careful about making information available to public… need to make sure it is used properly and filter what is disseminated. If you get people using information more, you run a risk, but in the end you find out how important it is, how it's being used, and that generates new knowledge. However, there is a concern about misuse of provided information, including legal misuse. Example: radar on bridge

in Halifax – HRM goes to US to acquire information system, when the nearby Bedford Institute of Oceanography (BIO) already has it.

- ***Demand-Driven Information*.** Provision of information should be demand-driven… Need to define demand side (who wants information?). There is a diversity of players on the demand side. This comes back to the scale question. Knowing who wants the information, we will then be able to develop ways for them to get information. Need to do with different types, scales and levels of groups.

- ***Scale.*** Need to provide information useful on the 'macro' scale, e.g., Government of Canada, and on the 'micro' (community, local) scale, e.g. to the Annapolis Basin Working Group.

- ***Participation.*** A lot of ocean management comes from resource management which traditionally does not bring in the public. Should not just hold a workshop for the public to come, but allow public input into plans before even developed. Not sure how to get them all to table.

- ***Information Systems.*** Need integrated approach to integrating information systems into management. Would like to see everybody have access to regional database on information… consortium agreement… all organizations put in a little bit of funding to have access to it. Information should be located in one central official system. Need a centralized but distributed system. Questions: Where is it going to be, who will maintain it for long-term?

- ***Digital Library.*** A digital scale library allows you to scale up and down, but where do we have the capacity to do digital? Dalhousie, for example, has capacity but not the funding. But if it could get the funding, once it is part of an institution it usually doesn't "die off". We have yet to scratch the surface of technology abilities and sharing or IM design process. Georgia Basin is an example of how technologies can improve communication etc. Need good information at a central location BUT must be a distributed information system.

B. Ideas for BoFEP: Future role in managing the Bay, linkages

- ***Role of BoFEP*.** To what extent does BoFEP speak for the Bay? What role should BoFEP play in management of the Bay? In integrated management? Should it be active? Is the role advocacy, information dissemination, advising? How do we communicate on an ongoing basis-not just at meetings? Need to let people know…

- ***Federal/Provincial Agreements*.** An example relates to a Canada/BC federal/provincial MOU recently in place to implement the Oceans Act - details in next Atlantic Coastal Zone Information Steering Committee (ACZISC) e-newsletter update. The Bay could be included in a corresponding east coast MOU in the future. It would be helpful if BoFEP could be in there to influence it,

to make sure that interests of the whole BoF are considered, not just specific provincial interests. Specifically, BoFEP could coordinate management on an ecosystem level, to ensure that BoF was managed as an ecosystem, instead of just drawing a line through it and saying that NB and NS are responsible for their respective sides. What should be the role of local areas in large scale MOUs like this? In any case, public participation needs to be included in the design process… a clear message from experience with land use planning

- ***ESSIM.*** The ESSIM (Eastern Scotian Shelf Integrated Management) Project and its process is important to understand and share with other areas. A draft management plan is to be ready for spring. ESSIM is developing ecological use and human objectives. The former is moving forward and has about 170 objectives that are becoming very organized. Human use objectives: framework for human objectives is difficult as there is not appropriate examples in the world nor in the agency itself. BoFEP has community based linkages whereas ESSIM doesn't - should develop ties between the two organizations, learn from each other.

3. The Coastal Communities of the Bay Round Table

The discussion focused primarily on what is going on in the Bay's coastal communities with respect to their participation in the management of renewable resources and how to enhance this participation. It was an opportunity to tell some of the more informative community stories from the region, share some of the successful collaborative experiences and learn from and support each other in our ongoing efforts.

For example, in northern Maine a network of lobster fishermen has been working effectively together for a number of years. Shocked by the dramatic collapse of the ground fishery, these fishermen wanted to make sure that a similar thing didn't happen to their lobster fishery. Initially the group was rather small and it took some time to build the necessary level of trust among those involved. Typically fishermen are fiercely independent and sharing information about their resource and their activities doesn't come naturally. However, they managed to develop a set of mutually acceptable principles that facilitated their working together in a trusting and constructive manner. They managed to get beyond their initial self-interest and came to recognize their many mutual interests and the benefits of working together effectively as a team to address the issues and protect their livelihoods. They have created a Marine Resource Centre to support their activities and are increasingly active in trying to influence government policies regarding their fishery.

Here in Atlantic Canada, the Atlantic Coastal Action Program (ACAP) supported by Environment Canada is probably one of the most successful government programs involved with community social and economic development and promoting the sustainability of coastal communities. In 1991 the Clean Annapolis River project (CARP) was designated the first ACAP site in the region. There are now 14 such groups spread throughout the four Atlantic Provinces. An independent audit has recently shown that the ACAP program even makes money for the government, since much more is

collected in payroll taxes than is actually spent by Environment Canada in supporting the program. ACAP projects have also served as an important practical training ground - and often the first real job in their field - for many new science graduates.

It was noted that there are a great many organizations throughout the region dealing with different aspects of environmental conservation, the sustainable use of natural resources and the economic and social well-being of coastal communities. The number of such groups is increasing steadily in response to the proliferating issues, with a resulting increase in competition amongst them for limited volunteers and funds. There is concern about the likelihood of burn out amongst volunteers with inadequate support who are involved in too many issues. It is important to be alert for signs of volunteer burnout. Volunteers need to be helped to reinvigorate themselves, to be given new and interesting challenges and steered towards fulfilling tasks suited to their particular skills and interests. It is also very important to recognize the accomplishments of the volunteers, reward their efforts and celebrate goals achieved. It was noted that typically the more successful organizations have at least one part or full time paid staff person to coordinate the organization's activities and to provide the much-needed support to the volunteers. It was emphasized also that it is critical for each community group to have a very clear idea of its goals and directions so that its efforts can be carefully focussed. Groups also need to be cautious about raising inappropriate expectations amongst its members and the general public.

It is important to find ways of encouraging and assisting the many different groups to work together to advance their goals jointly and reduce overlap and duplication of effort. It might also prove advantageous if several such groups could work together to prepare joint proposals for submission to potential funders instead of regarding each other as competitors for the limited funds available. Foundations and other funding groups are more inclined to look favourably on broader, more diverse projects involving a number of different, but complementary, partners. Innovative multi-partner projects that engage the public often catch the eye of funders. Furthermore, diverse groups working together are often much more creative than individual groups working by themselves on their own limited interests. For example, a salmon river association was interested in restocking local streams and restoring fish habitat. They began by involving a local school in the project and setting up a small-scale fish hatchery in the classroom. This encouraged students to learn about salmon biology and ecology and got them interested in restocking local streams with the fish. They then involved industry in the project by working with a cement company to explore the use of waste cement dust to buffer streams acidified by acid rain, thereby turning a waste product into a potentially salable commodity. Working with a local entrepreneur they also used scallop shells as another way of improving water quality. Eventually a university department also became involved in the project. This example demonstrates that a difficult problem confronted may in fact be an opportunity if it is just looked at in the right way. In addition, such small community-based efforts can often become seeds for much larger projects. There is no end to what a local community can achieve if the different groups work together and share their creativity.

Although some coordination of community groups may be beneficial, it is probably not necessary, or even desirable, to have a large umbrella organization to coordinate the efforts of the many individual organizations. However, there should be a centralized clearinghouse as a source of relevant, up-to-date information that could be easily accessed by the different groups. This might include a database of potential funding sources, information on government policies and program initiatives and sources of technical expertise and other support. There also needs to be more resources and effort devoted to the capacity building of local organizations so that they can more effectively tackle their objectives. It was noted that one of the important objectives of BoFEP is to facilitate the sharing of scientific and other information amongst its partners and with community groups all around the Bay. It's several working groups, its website and these periodic Fundy workshops play a important roles in information sharing as well as in fostering collaborative conservation and research activities among interested groups.

BoFEP AWARDS

A number of awards were presented at the Workshop Banquet. The first BoFEP "Environmental Stewardship Award" was presented to Pat Hinch of the Nova Scotia Department of Environment and Labour. This award recognizes an individual that has "contributed significantly to the environmental health/sustainability of the Bay of Fundy". Preferably someone best described as an "unsung hero", who has worked hard behind the scenes, out of the limelight, in advancing the Mission and within the Principles of BoFEP.

A "Special Recognition Award" was presented to Graham Daborn of the Acadia Centre for Estuarine Research at Acadia University. It recognizes his long-standing leadership of the Bay of Fundy Ecosystem Partnership, both as a founding member and its first Chair, a position he has served in with exceptional dedication and ability for the first decade of the organization's existence.

Awards were also presented for the best papers and posters presented by students during the Workshop. The winners were:

- **First place paper**- Ashley Sprague, University of New Brunswick, Fredericton, NB. *"The extent of Semipalmated Sandpiper (Calidris pusilla) movements while foraging in the Upper Bay of Fundy, and factors affecting this movement."*
- **Second place paper** - Sam Ng'gang'a, University of New Brunswick, Fredericton, NB. *"The proposed Musquash MPA: a case study on boundary delimitation concepts."*
- **First place poster** - Vanessa Paesani, Mount Allison University, Sackville, NB. *"Intraspecific genetic variation in the centric diatom Thalassiosira nordenskioeldii Cleve."*
- **Second place poster -** Nancy Chiasson, Saint Mary's University, Halifax, NS. *"Controls on the distribution of vegetation characteristics in a tidally restricted macrotidal salt marsh."*

FUNDY FESTIVAL AND SHOWCASE

Members of the public joined delegates in a Fundy Festival and Showcase held immediately after the workshop banquet on Friday evening. Moira Brown, a Senior Scientist at the New England Aquarium gave a talk entitled "Struggling in an Urban Ocean - the Plight of the North Atlantic Right Whale". This was followed by the viewing of a showcase of about 15 displays presented by organizations from all around the Bay of Fundy as well as the many scientific posters being presented at the workshop.

PROCEEDINGS OF THE 6th FUNDY WORKSHOP AND PLANS FOR THE 7TH

Preparation of the Proceedings of the 6th Bay of Fundy Workshop is now well underway and it is anticipated that they will be available for distribution early in the 2005.

At the BoFEP Annual General Meeting held during the Workshop it was tentatively agreed that the 7th Bay of Fundy Workshop will be convened in St. Andrews, New Brunswick in the autumn of 2006.