

# Out of the Fog 2

## Backgrounder

Saint John, New Brunswick, Canada

November 2-4, 2000

## Highlights

- ✿ *About OOTF2*
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## New at OOTF 2: Overnight Reports

- ✿ *Note takers and writers from CEF Consultants Ltd. will be present at each plenary session in the OOTF 2 workshop.*
- ✿ *On Friday and Saturday mornings, you will receive overnight summaries of topics and discussions addressed the previous day.*
- ✿ *If there are any questions, concerns or issues raised that you feel need to be more clearly addressed, please see Joanne Cook or Maia Jensen. They will be working out of the conference office behind the registration area.*

## About Out Of The Fog 2

Welcome to *Out of the Fog 2: Plotting a course for Information Exchange in the Gulf of Maine*. We're here to agree on a long-term plan to move ahead with effective environmental information exchange in the Gulf of Maine region. We're building on many years of initiatives, both those specifically directed at the Gulf area, and the broader questions of coastal zone information management. This backgrounder is designed to give you an overview of what's happened before, to bring all participants up to speed on the development of this issue. There's no need to rehash the many discussions that have gone on for more than a decade: what we need to do now is agree on an action plan that will move us forward over the years until 2020.

## How OOTF2 is supposed to work

The primary objective is to agree on a plan to further effective environmental information exchange in the Gulf of Maine region. Theme-based breakout sessions will be used to look at our common, specific experiences. Following on past efforts and GOMINFOEX requests for comments, sessions have been proposed, focusing on:

- Salt marsh restoration data requirements;
- Traditional ecological knowledge (TEK) and historic data capture;
- Water quality monitoring;
- Aquaculture siting and development; and
- Community-based management requirements.

We hope that by looking at our past experiences, we can better consider the various models for information exchange.

The purpose of the breakout groups is to provide a concrete basis to look at our successes and failures in information exchange; we hope the plenary sessions that follow will identify the existing capabilities, barriers and possible actions that might be taken to remove barriers for each of the issues.

We are coming to this table with a wide range of options, from the *status quo* through to, at the other extreme, a large centrally-funded and controlled exchange, using as a model the Great Lakes Information Network (GLIN).

The conference is designed as an iterative whole; please try not to drop in and out. Attending one or two theme sessions because they are in your area of interest will not be helpful to other participants working in the plenaries to come to pragmatic, functional decisions, and identify people and organisations who can act on them.

# What's been done before: Out of the Fog 1

The New England Aquarium and the Gulf of Maine Council on the Marine Environment (GOMC) hosted *Out of the Fog: Furthering the Establishment of an Electronic Environmental Information Exchange for the Gulf of Maine* in 1998 (OOTF 1), in response to the immediate need to improve data and information exchange among interest groups. Participants came from many backgrounds, including commercial fisheries, watershed management, aquatic science and education. OOTF 1 attempted to build on past efforts such as the Environmental Data and Information System (EDIMS), Research Environmental Data and Information System (REDIMS), Atlantic Coastal Zone Information Steering Committee (ACZISC) and others.

The purpose of OOTF 1 was:

- 1) to explore interest in and the feasibility of establishing a more unified network for exchanging information and data about the Gulf of Maine;
- 2) to examine regional initiatives from other areas of the country; and
- 3) to identify the best approach and develop an action plan for establishing a regional network for the Gulf of Maine, should the group agree that it was needed.

In the end, a GOMINFOEX Action Committee of volunteers was established to test some options and pursue a regional information exchange. A GOMINFOEX vision was developed and the committee agreed to Terms of References.

## *OOTF 1 Workshop Findings*

There was an overwhelming consensus that access to and sharing of Gulf of Maine information and data should be maximized through linkages among local initiatives. Most participants supported the notion of centralized access (i.e., a portal or a front door) to information.

However, the creation of a portal or front door with options for people seeking information and/or data would require some synthesis; some were concerned that this opened the possibility of misinterpretation. This concern could be somewhat alleviated through a bottom-up approach; interest groups would be instrumental in generating and maintaining their own information and data.

The final responsibility for compiling, posting and maintaining information and data should lie with respective interest groups. Participants stressed the need for a two-way exchange of information, adequate training for network users and a bottom-up approach to network development. It was also clear that, due to limited government and foundation moneys, a regional network must be self-sustaining.

Ultimately, the group felt that a regional electronic information and data exchange would help improve resource management decisions by empowering people through increased efficiency in information and data distribution.

The group adopted two over-arching goals:

- 1) To provide a mechanism for communication and information (possibly data) exchange among existing efforts in the Gulf of Maine; and
- 2) To make Gulf of Maine information and, at some level, data more accessible to a diversity of user groups.

*continued on page 7*

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# What's been done before: Visions, Designs, and Actions

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A few months ago, Paul Boudreau of the Canadian Department of Fisheries and Oceans reviewed many of the past decade's reports and workshop proceedings on the issue, and summarized their recommendations. Looking at Paul's results, it is clear that they fall into three categories:

**needs and overall vision:  
why do we need this? what should it do?**

**design criteria and suggested  
mechanisms: ideas about how to proceed**

**implementation and technical  
considerations: what actual steps to take**



Tables beginning on the opposite page show you what has been recommended over the years, and what actions have — or have not! — followed. They should give you a reasonable overview of the plethora of suggestions that have accumulated since 1992.



***NOTE: The "actions to date" columns only include a limited selection of what has been accomplished, that members of the Action Committee know about. The Committee strongly invites your comments and additions of things that are addressing the issues. We ask for your suggestions for projects, actions, groups of people, web sites, etc. All are acceptable for inclusion in the tables, which are an ongoing effort.***



**Please** take the time to jot down your suggestions, and return the centre pages of this backgrounder to the registration desk, Paul Boudreau, or Joanne Cook.

Information Exchange Action Steps/Recommendations from past Gulf of Maine Workshops and Coastal Information Management Reports:

synopsis of summaries compiled by Paul Boudreau (boudreaup@mar.dfo-mpo.gc.ca)

The Visions	Actions as of May 2000
<p><b>Out of the Fog: Furthering the Establishment of an Electronic Environmental Information Exchange for the Gulf of Maine, 1999</b></p> <p>Identify ways to link people with people.</p>	<p>GOMINFOEX continues</p>
<p><b>Protecting the Gulf of Maine from Land-based Activities: Workshop I: Issues, Priorities and Actions: 1998</b></p> <p>Define specific coastal development communication/education objectives; identify and characterise the target audience (that is fishers, schoolchildren, municipal decision makers, state/provincial governments, nongovernmental organisations, etc.)</p> <p>Identify and assess current knowledge of the marine and coastal habitats of the Gulf of Maine and the existing and potential effects of pollutants from land-based activities on their sustainability.</p>	<p>GPAC</p>
<p><b>Coastal Monitoring and the Bay of Fundy: Proceeding of the Maritime Atlantic Ecozone Science Workshop held in St. Andrews, New Brunswick, November 11-15, 1997</b></p> <p>Foster effective communications among interested groups and individuals (e.g. workshops, meeting, web site);</p> <p>Form a geographically dispersed, flexible, adaptable, multidimensional inclusive network ("Virtual Institute") linking all partners who equally share the vision and the principles.</p> <p>Facilitate the timely sharing of information and knowledge (e.g. bibliographies, science publications, directories of individuals, institutions, activities, projects and other initiatives).</p> <p>Promote activities that encourage the facilitation of long-range planning in the coastal zone.</p>	<p>BoFEP ongoing</p>
<p><b>Bay of Fundy Issues: a scientific overview. Workshop Proceedings, Wolfville, N.S., January 29-February 1, 1996</b></p> <p>Promote the establishment of a co-ordinated long-term monitoring program, involving research scientists and trained volunteers to facilitate the early detection of significant changes in key ecological processes and populations.</p>	
<p><b>Coastal Information Technology Architecture Plan (CITAP), 1994</b></p> <p>raise awareness and communicate the implications and benefits.</p>	
<p><b>Gulf of Maine Data and Information Systems, 1993</b></p> <p>The Gulf of Maine Information Management System should not re-invent any wheels. A vehicle should be put in place to generate and distribute a directory of the component systems and assure the compatibility with important specific systems.</p>	
<p><b>Coastal Information Network Phase 1 report - Definition, Architecture and Implementation, 1992</b></p> <p>The implementation of a Coastal Information Network (CIN) should involve operational data that is currently needed for environmental regulation and management in the coastal zone. This is the most appropriate starting point because it eliminates many of the hurdles associated with control of access to data and ownership and it will provide the most immediate benefits.</p>	

# *Please remember —*

The Design Elements	Actions as of May 2000
<p><b>Out of the Fog: Furthering the Establishment of an Electronic Environmental Information Exchange for the Gulf of Maine, 1999</b></p> <p><b>Planning</b></p> <p>Identify ways to link people with people</p> <p>Prepare a strategic plan, and involve designers, programmers and system architects in the planning process.</p> <p>Define goals and objectives and prioritise action steps generated during the workshop</p> <p>Conduct an in-depth review of regional efforts, particularly those that attending OOTF 1, to evaluate their application to the Gulf of Maine.</p> <p>Consider focussing initially on major nodes.</p> <p>Efforts must be undertaken to gain management level buy-in within respective organisations to ensure their willingness to share information and data. Perhaps a Memorandum of Understanding (MOU) should be generated to solidify participation in network.</p> <p><b>Financing</b></p> <p>Develop a plan for sustainable funding.</p> <p>Conduct a cost analysis. Be realistic and include all real costs. Core costs need committed funding for 3-5 years minimum.</p> <p>If a fee-based system is chosen, consider developing a scale of costs depending on the level of information that the data user is seeking. Reasonable supporter fees including a sliding scale and in-kind support be stipulated.</p> <p><b>Design details</b></p> <p>Begin to link existing Gulf of Maine initiatives through low cost means.</p> <p>Consider establishing a webring.</p> <p>Develop quality control criteria/standards, and develop a seal of approval that is used by all network members to aid in quality control.</p>	<p>GOMINFOEX: ongoing</p> <p>Ongoing, through <a href="http://www.gominfoex.org">www.gominfoex.org</a></p> <p>Ongoing</p>
<p><b>Understanding Change in the Bay of Fundy Ecosystem. 1999c. Proceedings of the 3<sup>rd</sup> Bay of Fundy Science Workshop, Mount Allison University, Sackville, New Brunswick, April 22-14, 1999</b></p> <p>Identifying, monitoring and responding to change in all of its various facets is a monumental task ... the key to making headway is to act strategically and undertake projects that are manageable, meaningful and that might attract broad support and input from all interested parties.</p>	<p>BoFEP/ GOMINFOEX/ others</p>
<p><b>Coastal Monitoring and the Bay of Fundy: Proceeding of the Maritime Atlantic Ecozone Science Workshop held in St. Andrews, New Brunswick, November 11-15, 1997</b></p> <p>(BOFEP) Serve as a readily accessible network for scientific, community and other knowledge pertaining to the Bay of Fundy.</p>	<p>On-going</p>

# *we're counting on your input!*

The Design Elements (2)	Actions as of May 2000
<p><b>Bay of Fundy Issues: a scientific overview. Workshop proceedings, Wolfville, N.S., January 29-February 1, 1996</b></p> <p>Pursue with the appropriate agencies the concept of having the entire Bay of Fundy formally designated as an EMAN site.</p> <p>Initiate discussions with key environmental organisations throughout the Fundy region with a view to jointly convening a series of regional public workshops to discuss environmental issues and explore ways of meaningfully involving communities in projects seeking to better understand and conserve the Fundy marine ecosystem.</p>	
<p><b>Bridging the Gulf: A Watershed of Watersheds; A U.S. and Canadian Citizen's Conference on Environmental Monitoring in the Gulf of Maine. May 30-June 1, 1996.</b></p> <p>Use BoFEP as a mechanism to improve communications with other groups.</p> <p>Strong support for information exchange systems that include facilitation of community groups and their resources.</p>	<p>BoFEP:  <a href="http://www.auracom.com/~bofep/">http://www.auracom.com/~bofep/</a></p> <p>Coastal Network of the Gulf of Maine:  <a href="http://fox.nstn.ca/~carp/CNet/">http://fox.nstn.ca/~carp/CNet/</a>  <a href="http://www.coastalcommunities.ns.ca/">http://www.coastalcommunities.ns.ca/</a></p>
<p><b>Coastal Information Technology Architecture Plan (CITAP) – Stage 1 Report (1994)</b></p> <p>Understand the frame of reference for each of the organisations impacted by the change that may happen as the vision is pursued.</p> <p>Identify a Champion and strong sponsors for the various aspects.</p> <p>Look for opportunities of capturing and leveraging know-how.</p>	<p>Gulf of Maine Council</p>
<p><b>Gulf of Maine Data and Information Systems (1993)</b></p> <p>A regional Gulf of Maine Information Management System should be developed.</p> <p>A distributed system utilizing INTERNET, as opposed to a centralized system, should be implemented.</p>	<p>EDIMS -  <a href="http://rossby.unh.edu/edims/">http://rossby.unh.edu/edims/</a></p> <p>Gulf of Maine  <a href="http://www.gulfofmaine.org">http://www.gulfofmaine.org</a></p> <p>GOMINFOEX -  <a href="http://www.gulfofmaine.org">http://www.gulfofmaine.org</a></p> <p>Standard now</p>
<p><b>Coastal Information Network Phase 1 report - Definition, Architecture and Implementation (1992)</b></p> <p>Strong support from the potential user community and a combination of funding sources will be necessary to allow CIN to become a reality.</p> <p>It will be equally important that the participants represent both high and low-ends of the technological spectrum - including an agency with mainframes and distributed datasets as well as small-scale networked</p>	

Concrete Steps	Actions taken as of May 2000
<p><b>Out of the Fog: Furthering the Establishment of an Electronic Environmental Information Exchange for the Gulf of Maine, 1999</b></p> <p><b>Planning</b></p> <p>Establish an Action Committee, representing relevant user groups, to further the effort resulting from this workshop towards the establishment of a regional electronic information and data exchange.</p> <p>Identify an institutional leader to get things rolling.</p> <p>Create an Out of the Fog listserver, or alternatively, use an existing listserver such as GulfTalk as a forum for continued communication on this topic.</p> <p>Create a mailing list for all participants who have websites include webmasters' contact information.</p> <p>Define tasks incrementally and fund each task separately in the beginning.</p> <p>Incorporate a "silly-word" metatag for Out of the Fog, such as "OOTF", to help search and to articulate partners</p> <p><b>Research/Technical Issues</b></p> <p>Survey potential partners of useful sites to link.</p> <p>Ask participants who are involved in the establishment of information/data networks/systems to characterise their users.</p> <p>Conduct a more extensive user group survey to include fishermen and marine educators</p> <p>Review existing web links and annotate for different users.</p> <p>Assess strengths and weakness of current databases.</p> <p>Conduct an analysis of the quality of existing tools or search engines for Gulf of Maine</p> <p>Centralise search utility and indexing (AltaVista, e.g. 4NR)</p> <p><b>Finances</b></p> <p>Identify interested partners - those who are willing to leverage resources to provide initial support for an information/data exchange network.</p> <p>Leverage in-kind contributions from users to reduce costs;</p> <p>Conduct a market survey to assess people's willingness to pay, once the level of service being offered has been determined;</p> <p>Encourage participants to include support in project funding budget overhead;</p> <p>If advertising is considered as a revenue model, get feedback from commercial efforts that rely on online advertising revenue;</p> <p>Look into taxpayers funding (i.e. the Library of Congress and local</p>	<p>GOMINFOEX Action Committee: <a href="http://www.gulfofmaine.org/">http://www.gulfofmaine.org/</a></p> <p>Gulf of Maine Council and others? <a href="mailto:outofthefog@neaq.org">outofthefog@neaq.org</a>; <a href="mailto:GULFTALK@MITVMA.MIT.EDU">GULFTALK@MITVMA.MIT.EDU</a></p> <p><a href="http://is.dal.ca/aczisc/fundy/forum">http://is.dal.ca/aczisc/fundy/forum</a></p> <p>~ 20 sites participating - varying success/timeliness</p> <p>Gulf of Maine Educators Association</p> <p>Compare Widoff 1996 with present "Silly-Word" results/GoM Council Links/Fishers Web Site/ACZISC/etc.</p> <p>Ongoing</p> <p>Being considered by Island Institute</p> <p>GOMINFOEX and others - ongoing</p>
<p><b>Coastal Monitoring and the Bay of Fundy: Proceeding of the Maritime Atlantic Ecozone Science Workshop held in St. Andrews, New Brunswick, November 11-15, 1997</b></p> <p>Promote and facilitate regular assessment of the state of the Bay of Fundy ecosystem of specific issues (with reports distributed via newsletter, e-mail and/or web site) that will identify issues, priorities, accomplishments and new directions.</p>	
<p><b>Bay of Fundy Issues: a scientific overview. Workshop proceedings, Wolfville, N.S., January 29-February 1, 1996</b></p> <p>Set up a working group to explore ways of acquiring, assessing and using traditional environmental knowledge to evaluate long-term changes in the Bay of Fundy ecosystem, and consider means of promoting and facilitating the involvement of knowledgeable volunteers in the long-term monitoring of key local marine ecosystem indicators.</p> <p>Set up a Fundy Ecosystem Project home page to facilitate the exchange of information among participants. This could provide access to the updated Bay of Fundy Bibliography developed for the Workshop and serve for disseminating information about developing research programs and Fundy coastal zone issues.</p> <p>Prepare a series of non-technical fact sheets on selected Bay of Fundy issues. These would be circulated to schools, community and environmental groups, and other interested parties and would provide concise, up-to-date scientific information about issues in an interesting, straightforward fashion. In addition, the same information should be made available on-line by means of a suitable home page on the World Wide Web.</p> <p>Prepare decennial State of the Bay Reports, that in addition to reviewing environmental trends in the Bay, also recommends further remedial</p>	<p><a href="http://www.auracom.com/~bofep/">http://www.auracom.com/~bofep/</a></p> <p>On-going by BoFEP - <a href="http://www.auracom.com/~bofep/factsheet.htm">http://www.auracom.com/~bofep/factsheet.htm</a></p>

## What's been done before: Using Technology to Further Technological Design, through the *Fundy Forum Timed Discussion*

The Fundy Forum Timed Discussion was held on-line from 29 May to 9 June 2000. Seventeen people from a variety of backgrounds participated, including NGOs, private sector, artists, planners, and government. Four main issue-oriented questions were put forward for discussion.

**Question:** How great is your need to exchange environmental data and information with others? Do you have a government mandate to collect/maintain data of interest to others; do you collect/sell data and information to others; do you require the input of others to interpret your observations; or can your work simply benefit from having access to information from others within the Region?

**Response summary:** There is a very great need for improved information exchange and easier data acquisition. Participants agreed with all the cited needs, depending on the context of their work.

**Question:** What is useful information to you? Are you primarily interested in: i) real-time data such as hourly air temperature or wave height; ii) data files and framework information such as GIS mapthemes describing roads and bathymetry; iii) interpretative overview such as fact sheets, books, reports and atlas information; and/or iv) contact information for people and agencies?

**Response summary:** All types of information are useful; there will be specific data needs which depend on the question being asked — and who's asking. A recurring issue raised is the lack of readily accessible historical information, which can be vitally important.

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## What's been done before: Out of the Fog 1, cont'd

In addition, the following points were identified as important elements of a regional network:

- Post useful information and use disclaimers;
- Encourage data holders to post and describe products, information and data that is available;
- Limit data sets and links to Gulf of Maine;
- Never have "under construction;"
- Give contributors format flexibility, and be adaptable;
- Make it user-friendly for all interest groups (especially fishermen, managers and communities);
- Create an intuitive interest/issue road map on the "front door" that allows users to quickly head down their path of interest/expertise;
- Do not be afraid to experiment;
- Use technology that can degrade gracefully for alternate accessibility (e.g., web-TV, box-phone system-printed material);
- Use XML for data/content interdependence - create tools that lead to open interfaces;
- Empower users to ask better questions; and
- Balance technology with ease of accessibility (good content versus bells and whistles).

OOTF I reviewed other existing systems, and exposed the participants to some of the functionality provided by the web. A volunteer GOMINFOEX Action Committee was established to test some options and pursue a regional information exchange.

A GOMINFOEX Vision was developed and the committee agreed to a Terms of Reference.

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## OOTF Action Committee Update

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The Action Committee has met quarterly since November 1998. Interested parties have undertaken a number of tests and experiments. These include:

*Participants' map to identify user groups;*

*Common co-ordinates to identify linkages;*

*E-Atlas to investigate distributed data access and provision;*

*Silly-Word to test simple, easy, cheap methods of facilitating data searching;*

*Fishers' web site as a tool to get fishers' input on their needs;*

*Gulf of Maine Educators Association (GOMEA) User Needs Survey;*

*Fundy Forum timed discussion on information exchange; and,*

*Organisation of this workshop.*

Some success has been achieved as more people have become aware of resources, opportunities and needs. But much more remains to be done!

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### The Out of the Fog Workshop Vision Statement

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"To create a framework within which a variety of interest groups can work on their own issues (semi-independently), while drawing upon the expertise of other groups as needed to enhance data and information sharing within the Gulf of Maine."

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**Question:** Are you satisfied with existing exchange/access methods? Does the data that you need to do your job exist, is it readily available, affordable and of the proper scale and format?

**Response summary:** Participants were generally unsatisfied with existing exchange/access methods. The majority thought that there is an overload of data out there that requires too much searching or wading through. Finance and policy also hinders easy access. Participants found that there is a need for curriculum

and teaching, interpreted information vs. raw-data, and the importance of personal contact, face-to-face meetings as well as contact information for projects and information resources.

Comments were also made on the variety of audiences that require different types of information. The scientific community should more readily make their research available in meaningful form to the widest audience possible.

Participants offered thoughts on how to better exchange/access methods to

information. On-line access to information could be made easier by having an on-line database that describes existing data sets. Data should be synthesized and correlated on similar sites. Visuals, such as mapping (point and click), should be used more often. As well, there is a need to better technological alternatives already in place such as Internet search engines, compiling lists of links, and "Silly-Word" which requires web masters to actively place a unique meta tag in their homepage.

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## Fundy Forum Timed Discussion, cont'd from previous page

**Question:** Based on your experience, do you see any need for more development/ implementation/ work on environmental information exchange in the Gulf of Maine to maximize the benefits from our coastal and marine resources to the residents of the region? If yes, what efforts/ products would you suggest/support to improve a shared information exchange? Participants felt on the whole that there is a need for more development/ implementation/ work on environmental information exchange in the Gulf of Maine to maximize the benefits from our coastal and marine resources to the residents of the region.

There is a need to identify the different users and different ways to extract information that people actually want. Effort should be made to effectively communicate over a wide geographic range while paying attention to local communities.; updated, clear and concise information for all users is needed. Also, raw data should be made available along with summaries of projects.

## Out of the Fog 2: The Backgrounder

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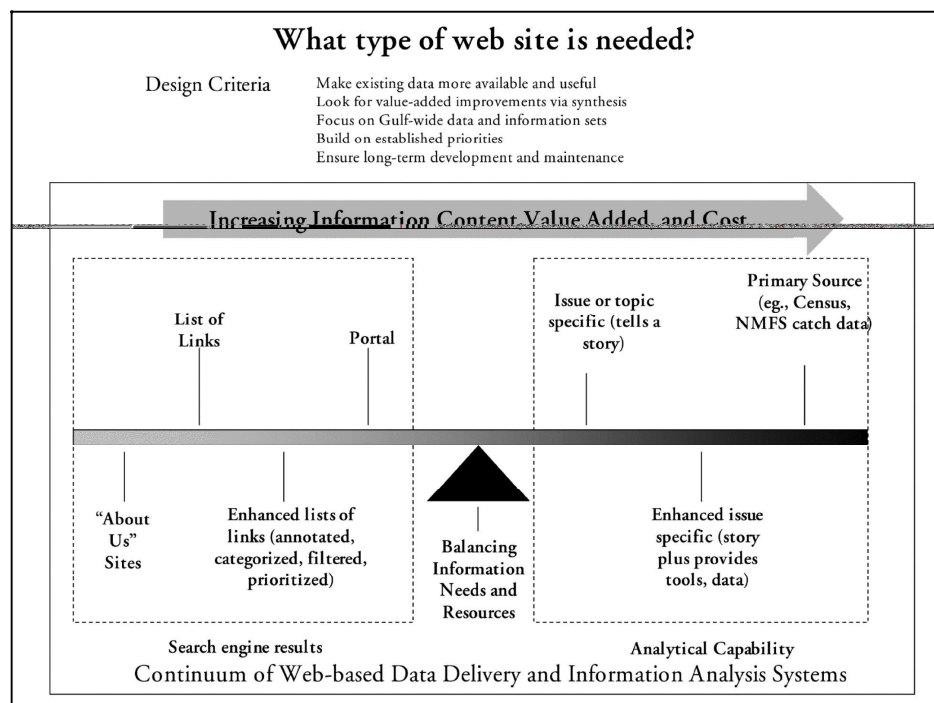
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Web site design suggestion, from the National Oceanographic and Atmospheric Agency,



## For your reading pleasure

Following is but a partial selection, in reverse chronological order, of the available relevant literature on information exchange in the coastal zone.

Farrey, P.M., M.L. Mooney-Seus and H.C. Tausig. (eds.) 1999a. Out of the Fog: Furthering the Establishment of an Electronic Environmental Information Exchange for the Gulf of Maine. New England Aquarium Aquatic Forum Series, Report 99-1. Pp. 136.

Ollerhead, J., P.W. Hicklin, P.G. Wells and K. Ramsey. (eds.) 1999b. Understanding Change in the Bay of Fundy Ecosystem. 1999c. Proceedings of the 3<sup>rd</sup> Bay of Fundy Science Workshop, Mount Allison University, Sackville, New Brunswick, April 22-14, 1999. Environment Canada, Atlantic Region Occasional Report No. 12. Environment Canada, Sackville, New Brunswick. 143 pp.

GPAC/CEC. 1998a. Protecting the Gulf of Maine from Land-based Activities: Workshop I: Issues, Priorities and Actions. Saint John, New Brunswick, Canada, 27-29 April, 1998. Commission for Environmental Cooperation.

GPAC/CEC. 1998b. Protecting the Gulf of Maine from Land-based Activities: Workshop I: Issues, Priorities and Actions. Saint John, New Brunswick, Canada, 27-29 April, 1998. Commission for Environmental Cooperation.

Burt, M.D.B. and P.G. Wells. (eds.) 1998. Coastal Monitoring and the Bay of Fundy: Proceeding of the Maritime Atlantic Ecozone Science Workshop held in St. Andrews, New Brunswick, November 11-15, 1997. Huntsman Marine Science Centre, St. Andrews, N.B.

Percy, J.A., P.G. Wells and A.J. Evans (eds.) 1997. Bay of Fundy Issues: a scientific overview. Workshop Proceedings, Wolfville, N.S., January 29-February 1, 1996. Environment Canada- Atlantic Region Occasional Report No. 8. Environment Canada, Sackville, New Brunswick. 191 pp.

Anon. 1997. Rim of the Gulf: Restoring Estuaries and Resources - Conference Proceedings May 8-10, 1997. C. White (ed.) Island Institute. 196 pp.

Widoff, L. (ed.) 1996. Bridging the Gulf: A Watershed of Watersheds; A U.S. and Canadian Citizen's Conference on Environmental Monitoring in the Gulf of Maine. May 30-June 1, 1996. Portland, Maine, Collaboration of Community Foundations in the Gulf of Maine. P.O. Box 21, Freedom, ME 04941. Pp 92 + Appendices.

Anon. 1994. Coastal Information Technology Architecture Plan (CITAP) - Stage 1 Report. .

Phelps, D.K., W. Brown, M. Buchholtz ten Brink, J. Paul and J.S. Rosen. 1993. Gulf of Maine Data and Information Systems. RARGOM Report No. 93-1. 204 pp.

Anon. 1992. Coastal Information Network Phase 1 report - Definition, Architecture and Implementation. Pp 26 + Appendices.