Tides of Change Across the Gulf: Chapter 7 - Recognizing Achievements, Celebrating Success

Appendix A - Background Information on Groups

Table of Contents

New Brunswick

Table of Contents (cont'd)

Gulf of Maine Council

Affiliated Agencies

Achievement Survey Reports

Massachusetts

Organization: **Essex County Greenbelt Association, Inc.**

Address: 82 Eastern Avenue

City, State/Province: Essex, MA

Zip/Postal code: 01929

Submitted by: Edward O. Becker (ecga@ecga.org on Monday, March 29, 2004 at 11:10:35

Achievement_1: Awareness

Achievement_1-Description: The Greenbelt Plan (Initiated in 2003 - Ongoing): The Greenbelt Plan will be a powerful tool for smart growth and the protection of our precious and threatened open space in that it will provide a county-wide vision and plan for land protection throughout Essex County. Using Greenbelt as established criteria for protection of land of ecological, agricultural and scenic importance, we will identify one or more landscape-scale corridors of highest priority for protection.

Achievement_2: Habitat

Achievement 2: The mission of the Essex County Greenbelt Association is to acquire land through conservation restrictions or fee ownership. When the organization was founded over 40 years ago, the Great Marsh, extending from Massachusetts to New Hampshire, was an area of key concern. Since our inception, Greenbelt has conserved thousands of acres of salt marsh in Essex County. We continue to meet the goal of protection this important habitat. In 2003, we purchased a 50 acre parcel of salt marsh in Ipswich, MA. In addition, Greenbelt is an active member in the Great Marsh Coalition, a group of organizations dedicated to preserving and restoring the 17,000 Great Marsh.

Achievement_3: Stewardship

Achievement 3: Property Monitor Program:
In 2002, Greenbelt reinitiated a new, revamped volunteer property monitor program. Over 60 volunteers are currently involved in the project. Monitors are assigned a property that is owned by Greenbelt. They perform tasks mostly related to property maintenance, including picking up trash, maintaining trails, monitoring use.

Achievement_4: Awareness

Achievement 4: Great Marsh Economic and Fiscal Study.
In 2003, the Great Marsh Coalition conducted a study to quantify the economic and fiscal benefits that accrue from recreation and commercial uses of the Great Marsh. Among the results: recreation activities generates over 5 million in revenue in 2000, and three out of four

survey respondents indicated a willingness to pay higher taxes to help protect the Great Marsh.

Current project 1: The Greenbelt Plan - See above.
This is our most pertinent ongoing project to promoting land conservation in Essex County, including the protection of the Great Marsh. The resulting product will be useful to other conservation organization, the state agencies, and local municipalities.

Current project 2: Ongoing: Greenbelt adheres to our mission to continue conserving land of ecological, scenic and historical importance in Essex County. To successfully meet our mission, our land conservation staff is finding more creative and innovative ways to secure land conservation projects. In 2003, a successful example of creative conservation was the protection of the 122 Storey Farm in Essex, MA. Several state, federal and local land conservation organizations were involved in the protection of the property.

Current project 3: Education and Outreach
Greenbelt has several initiatives to increase awareness and education about land conservation issues unique to Essex County, Massachusetts. One such method of outreach is through education of secondary school aged children. Greenbelt produces 3 curriculum guides with environmental education lessons and field experiments.

Organization: **Massachusetts Bays Program**

Address: 251 Causeway Street, Suite 800

City, State/Province: Boston, MA

Zip/Postal code: 02114

Submitted by: Peter Hanlon (peter.j.hanlon@state.ma.us) on Thursday, June 10, 2004 at 13:00:09

Achievement_1: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement_1-Description: Planning for the Future of the Massachusetts Bays:
In 1996, the Massachusetts Bays Program (MBP), in partnership with over 300 individuals representing numerous agencies, organizations, and municipalities, completed the Massachusetts Bays Comprehensive Conservation and Management Plan (CCMP). The CCMP, which was revised in 2003, contains seventeen major action plans and 87 specific action items for protecting and preserving the Bays' resources, ranging from restoring shellfish to stemming stormwater to preventing invasive species outbreaks. Since 1996, the MBP has led the implementation of the CCMP through an effective and creative partnering approach and has leveraged significant local implementation funding.

Achievement_2: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 2: Assisting the Massachusetts Bays Communities:
One of the success stories of the Massachusetts Bays Program has been our partnership with and assistance to the 50 Massachusetts Bays communities. The development of Local Governance Committees (LGCs), regional committees where groups of communities can meet to address issues and implementation of environmental projects, has ensured that each MBP community is represented as we strategize and plan for the future of the Bays. The MBPs regional staff provides hands-on technical assistance to LGC community members regarding water quality monitoring, protective bylaws, outreach, and other activities. This novel structure ensures local ownership and implementation of solutions Bays wide.

Achievement_3: Habitat Contaminants Maritime activities

Achievement 3: Restoring Massachusetts Shellfish Beds:
The Massachusetts Bays Program spearheaded and funded an interagency approach to shellfish bed restoration that aims to restore and protect high priority beds. This Shellfish Bed Restoration Program (SBRP) integrates the regulatory and enforcement efforts of multiple state agencies, RPAs, local Boards of Health, and citizens into systematic, goal-oriented resource management. Projects under the SBRP use innovative remediation techniques to target non-point source pollution, a major

source of shellfish contamination. The early successes of the SBRP resulted in the reopening of nearly 700 acres of shellfish beds and the adoption of this program coast-wide by the Massachusetts Coastal Zone Management Office (MCZM).

Achievement_4: Habitat Contaminants

Achievement 4: Searching for Invasive Species:

In July 2003, the Massachusetts Bays Program coordinated seven other National Estuary Programs and MIT Sea Grant to conduct a Rapid Assessment Survey (RAS) for marine invasive species in the Northeast U.S. This survey focused on fixed docks and piers at 20 different sites between Casco Bay, Maine and New York Harbor. This is the second RAS held in the Massachusetts Bays (the first was in 2000), and future surveys are expected to occur approximately every five years.

Current project 1: State of the Bays 2004:

The Massachusetts Bays Program held a State of Bays Symposium in May 2004 to gather coastal scientists, managers, and other interested parties to discuss the most recent trends in the Bays and to begin to determine steps necessary to further their protection and restoration. As part of a suite of outreach and education products and events under development in 2004 by the MBP, the State of the Bays 2004 report was released at the symposium to provide the general public with an overview of the current health and conditions of Massachusetts and Cape Cod Bays. The Symposium Proceedings, developed for Fall 2004, will be the vehicle to promote the findings of the symposium. Disseminating this information to researchers and decision-makers will help to strengthen and create scientific partnerships aimed at better understanding the Bays, and will help us to track successes as actions identified at the symposium are implemented.

Current project 2: Monitoring the Massachusetts Bays:

Following on the successful 2002 Marine Monitoring Summit and 2004 Coastal Indicators Summit to establish a regional monitoring network and a suite of indicators in the northeast, the Massachusetts Bays Program (MBP) will work with EPA and the Gulf of Maine Council for a regional approach. The MBP will work with the regional monitoring network to develop a marine monitoring plan with a focus on coastal indicators. Outreach materials will be developed to translate the scientific findings from these efforts to the general public.

Current project 3: Massachusetts Bays Estuary Association:

A new organization, the Massachusetts Bays Estuary Association, was incorporated in January 2004 as the non-profit partner of the MBP. The goal of the Association is to be the " voice of the Bays," and provide an expanded reach to the MBP's outreach and fundraising efforts. In 2004, the Association will complete its roll-out and initiate several outreach

efforts together with the MBP, most notably a coordinated effort to address stormwater in MBP communities.

GOM Summit Survey: Submit Completed Survey

Organization : **Massachusetts Bay Monitoring Program**

Address: 100 Morrissey Blvd.

City, State/Province: Boston, Massachusetts

Zip/Postal code: 02125

Submitted by: Meng Zhou, Mingshun Jiang, Gordon T. Wallace, Yiwu Zhu, Bernie Gardner (meng.zhou@umb.edu) on Wednesday, June 02, 2004 at 09:56:03

Achievement_1: Habitat Maritime activities Awareness Stewardship

Achievement_1-Description: This project is supported by the Massachusetts Water Resources Authority (MWRA) and University of Massachusetts Boston (UMB) as a part of the Massachusetts Bay monitoring program. The project aims at predicting the physical bio-chemical environment, water quality and ecosystem in Massachusetts and Cape Cod Bays (MBS) using advanced numerical models. In particular, the impacts of the MWRA outfall relocation on the MBS water quality and ecosystem are investigated and monitored through numerical simulations. The major achievements include:

(1) significant understanding of the physical-biological processes in the MBS;
(2) several research manuscripts accepted for publications or in preparation;
(3) a well-maintained website that updates the progresses of the project and is used for public education.

Current project 1: "Maintenance, enhancement and application of the Massachusetts Bay model", Meng Zhou (PI), funded by MWRA, 06/01/01-05/31/05.

GOM Summit Survey: Submit Completed Survey

Organization: **Massachusetts Water Resources Authority (MWRA)**

Address: 100 Morrissey Blvd.

City, State/Province: Boston, Massachusetts

Zip/Postal code: 02125

Submitted by: Meng Zhou, Mingshun Jiang, Gordon T. Wallace, Yiwu Zhu, Bernie Gardner (meng.zhou@umb.edu) on Wednesday, June 02, 2004 at 09:56:03

Achievement_1: Habitat Maritime activities Awareness Stewardship

Achievement_1-Description: This project is supported by the Massachusetts Water Resources Authority (MWRA) and University of Massachusetts Boston (UMB) as a part of the Massachusetts Bay monitoring program. The project aims at predicting the physical bio-chemical environment, water quality and ecosystem in Massachusetts and Cape Cod Bays (MBS) using advanced numerical models. In particular, the impacts of the MWRA outfall relocation on the MBS water quality and ecosystem are investigated and monitored through numerical simulations. The major achievemnets include:

(1) significant understanding of the physical-biological processes in the MBS;
(2) several research manuscripts accepted for publications or in preparation;
(3) a well-maintained website that updates the progresses of the project and is used for public education.

Current project 1: "Maintenance, enhancement and application of the Massachusetts Bay model", Meng Zhou (PI), funded by MWRA, 06/01/01-05/31/05.

GOM Summit Survey: Submit Completed Survey

Organization: **New England Aquarium Dive Club**

Address: Central Wharf

City, State/Province: Boston MA

Zip/Postal code: 02110

Submitted by: Alicia Lenci (environmental@neadc.org) on Thursday, October 07, 2004 at 10:44:04

Achievement_1: Maritime activities Awareness Stewardship Other

Achievement_1-Other_category: Co Founder of Adventure Scuba Bus-converted short school bus for coastal outreach education and research

Achievement_1-Description: I am in my 5th year as Environmental Affairs Director with the New England Aquarium Dive Club Inc. I have been working hard to promote good environmental stewardship with not only the dive community but the coastal, wetland community as a whole..not just talking about the issues, but in the field! Each year our outreach activities, have grown as I have perfected our events to include the general beach going public not only divers. I have developed and coordinated volunteer divers programs for fish surveys, substraight surveys, exotic species surveys, and of course marine debris surveys. Shore divers are quite the sight and usually attract attention...so working from that....engaging the public awareness to environmental issues particular to our coastal health and heritage. With the "hook" of wonderful marine life right there at the "edge". By sharing nature with others, especially children in the outdoor setting is our best achievment.

Achievement_2: Maritime activities Awareness Stewardship

Achievement 2: Teaming up with other organizations to help make their events spectacular, those other organization have been, Stellwagen National Marine Sanctuary, Mass Audubon, Parker River Wildlife Refuge, and Mystic River Watershed Association. Being there to educated the community that uses and recreates our coastal environment.

GOM Summit Survey: Submit Completed Survey

Organization: **Tufts Center for Conservation Medicine**

Address: Wildlife Medicine Building, 200 Westboro Rd

City, State/Province: North Grafton, MA

Zip/Postal code: 01536

Submitted by: Rebecca Harris (becky.harris@tufts.edu) on Thursday, September 16, 2004 at 10:53:01

Achievement_1: Awareness Stewardship

Achievement_1-Description: Established in Massachusetts in 2002, this year the Seabird Ecological Assessment Network (SEANET) has extended beached bird monitoring throughout the Gulf of Maine. Currently there are over 150 volunteers walking beaches in the Gulf, including those in Nova Scotia with our collaborators at Bird Studies Canada. Volunteers walk a stretch of beach once or twice per month, collecting data on seabird mortality, live bird abundance, and when possible, collecting specimens for necropsy and samples for contaminants testing. To date, SEANET has held 23 lectures, presentations, or public education events throughout this region on threats to marine birds and ecosystem health.

Current project 1: The Seabird Ecological Assessment Network (SEANET), the first project of its kind in the region, brings together interdisciplinary researchers and volunteers in a collaborative effort to identify threats to marine and coastal birds throughout the northeastern US and Atlantic Canada. This project, initiated in 2002, sustains a long-term marine and coastal ecosystem health monitoring project using seabirds as sentinels, fostering participation by citizen scientists ranging from adult volunteers to school children. We are collaborating with numerous partners (including the Gulf of Maine Marine Data Partnership) on the development of a comprehensive distributed Internet mapping resource to facilitate research and applications of diverse data sets, including beached bird mortality data, bird population data from birders, pelagic seabird surveys done in collaboration with USFWS and NOAA, and Census of Marine Life data. We will utilize information technology to map, distribute and analyze marine and coastal bird population and mortality data, ocean contamination, biotic and abiotic coastal and marine factors, and emerging diseases.

Seven primary SEANET objectives are as follows:
1. continue to coordinate a web of experts on marine birds, environments, and issues,
2. continue and expand regular beached bird surveys conducted by an Atlantic coastal network of trained volunteers and students to collect and contribute data on seabird mortality,
3. strengthen a bycatch recovery effort, in collaboration with the US National Marine Fisheries Service, to develop a descriptive pathology for such

birds, and for baseline data on levels of disease, contaminants, and biotoxins in a wide range of species,
4. develop standard pelagic and offshore bird surveys with USFWS and non-profit and state agencies using â ships of opportunityâ with NOAA Fisheries; observers will collaborate to compile regular pelagic and offshore bird distribution information for use in offshore wind farm citing and other management needs.
5. continue development of web-based, searchable databases and interactive GIS maps for the assessment of risk factors and mortality patterns of seabird populations, in collaboration with the National Biological Information Infrastructure (NBII of the USGS), US EPA, and the Gulf of Maine Marine Data Partnership. This system houses a web-based reporting system, allowing volunteers to enter data directly,
6. use spatial statistical analyses to reveal â hot-spotsâ of concern geographically, e.g., where seabird populations may be threatened by high contaminant loads, and to compare species with different life-histories,
7. pursue research, education, and policy recommendations regarding these â hot-spotsâ and topics of particular conservation concern for coastal ecological health.

The ultimate goal of SEANET is to pinpoint areas of conservation and restoration priority, and to influence positive change. In the process, we hope our efforts will enhance environmental awareness in the region, and achieve an improved quality of life for the inhabitants, both human and wildlife. SEANET requires a long-term effort on the part of numerous collaborators and volunteers.

GOM Summit Survey: Submit Completed Survey

Organization: **Woods Hole Oceanographic Insitution (WHOI)**

Address: Clark 343, MS 21, Woods Hole Oceanographic Institution

City, State/Province: Woods Hole, MA

Zip/Postal code: 02543

Submitted by: Robert Beardsley (gji@whoi.edu) on Friday, June 04, 2004 at 13:23:46

Achievement_1: Habitat Awareness

Achievement_1-Description: The impact of Scotian Shelf Water "cross-over" on the plankton dynamics on Georges Bank: A 3-D experiment for the 1999 spring bloom.

Ji. R1, Chen C.2, P. J. S. Franks3, D.W. Townsend4, E.G. Durbin5, R. C. Beardsley6, and R.W. Houghton7

A coupled biological-physical model has been developed for the Gulf of Maine (GOM) /Georges Bank (GB) region. The biological model, based on nutrient and plankton features observed on GB, consists of 9 compartments: nutrients (nitrate, ammonia and silicate), phytoplankton (large and small size groups), zooplankton (large and small size groups), detrital organic nitrogen and silicon. The physical model for 1-D and 2-D experiment is ECOM-si and for the 3-D is FVCOM. The 1-D model results show that the physical-biological processes controlling spring bloom dynamics over GB varies with water depth. In the shallow and well-mixed regions, the timing of the spring bloom is sensitive to light intensity and the light attenuation coefficient, while the magnitude is regulated by the initial nutrient concentration and zooplankton grazing pressure. In the deeper regions, the seasonal onset of stratification directly attributes to the timing of the spring bloom. The 2-D model results indicate that the spring bloom dynamics in the shallow and well-mixed area of GB are very similar to the 1-D situation. A 'second' bloom can occur near the tidal mixing front area due to the seasonal onset of stratification. The spring bloom in the stratified region seems to be sensitive to vertical stratification, especially at the transition time during late spring. The 3-D experiments show that the formation of the phytoplankton bloom on the southeastern flank of GB is related to 1) transport of the Scotian Shelf Water, 2) wind- and tidal-induced vertical mixing and surface cooling, and 3) the location of the salinity front. Under a condition with sufficient supplies of nutrients from the slope, the bloom could occur due to an in situ growth of phytoplankton near the slope where the stabilized salinity front is

located. The model results suggest that an accurate simulation of the spatial distribution of temperature and salinity on GB and flow field across the Northeast Channel is a prerequisite for modeling the spring bloom over GB.

1Department of Biology, Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

2School for Marine Science and Technology, University of Massachusetts-Dartmouth, New Bedford, MA 02744

3Marine Life Research Group, Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA 92093-0218

4School of Marine Sciences, 5741 Libby Hall, University of Maine, Orono, Maine 04469

5Graduate School of Oceanography, University of Rhode Island, South Ferry Rd, Narragansett, RI 02882

6Department of Physical Oceanography, Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

7Lamont Doherty Earth Observatory of Columbia University, Palisades, NY 10964

Achievement_2: Habitat Awareness

Achievement 2:

Modeling Circulation, Stratification, and Biological Processes in the Gulf of Maine/Georges Bank Region

Changsheng Chen1, Geoffrey Cowles1 and R. C. Beardsley2

A coupled atmospheric and ocean circulation model system has been developed to study the impact of climate change on fish recruitment in the Gulf of Maine/Georges Bank region. This system includes 4 components: 1) a modified meso-scale meteorological model (MM5); 2) an unstructured grid finite-volume coastal ocean model (FVCOM), 3) a 9-component lower trophic level food web model (multiple PZND), and 4) a Lagrangian-approach larval fish model. The MM5 model is driven by output from the National Weather Service ETA model and uses a nested domain approach to forecast fields of wind stress, heat flux, precipitation and evaporation over a 5-day time period, with hindcasting calibrated using NDBC buoy wind measurement data. FVCOM is driven by tidal forcing, MM5-predicted wind stress and heat flux, freshwater discharge from rivers and upstream inflow conditions. By incorporating data assimilation with satellite-derived SST and current and hydrographic data from moorings and broad-scale ship surveys, FVCOM has successfully produced one-year simulations of the three-dimensional current field and distribution of

water physical and biological properties with a time step of 2 minutes for 1995 and 1999. The model fields exhibit significant seasonal and interannual variability. The MM5-FVCOM model system built for the Gulf of Maine/Georges Bank domain provides us with a new opportunity to examine the physically-driven long-term variability in primary and secondary production and fish population dynamics in this important region. This model system can be easily applied to other coastal areas for both scientific and resource management applications.

Keywords: Interannual variability, stratification, circulation, transport

1Graduate School of Marine Sciences and Technology, University of Massachusetts, 706 South Rodney French Boulevard, New Bedford, MA 02744-1221. Email: c1chen@umassd.edu; gcowles@umassd.edu

2Department of Physical Oceanography, Woods Hole Oceanographic Institution, Woods Hole, MA 02543. E-mail: rbeardsley@whoi.edu

Achievement_3: Habitat Awareness

Achievement 3: The Model Dye Experiments on Georges Bank

Chen, C.1, R. Houghton2, R. C. Beardsley3, and Q. Xu1

Process-oriented experiments with the finite-volume coastal ocean model FVCOM were conducted to examine the physical processes controlling water movement on the southern flank of Georges Bank (GB). The experiments were focused on the mid-May/early June 1999 period when fluorescent dye was released and tracked. The model results show that the model dye movement is closely related to small-scale fluctuations of the tidal mixing front over bathymetry. Onset of vertical stratification tends to slow down the upward diffusion of dye and traps the dye in the mixed bottom boundary layer. Horizontal resolution plays an essential role in the spatial distribution and movement of the dye. A 500-m horizontal resolution seems to be the minimum requirement to resolve the spatial size of the dye. The fact that data-assimilation with high-resolution hydrographic data is required to reproduce the trajectory of the dye implies that small-scale variations in water stratification must be resolved in order to simulate the cross-frontal nutrient and other biological fluxes on Georges Bank.

1School for Marine Science and Technology, University of Massachusetts-Dartmouth, New Bedford, MA 025430

2Lamont Doherty Earth Observatory of Columbia University, Palisades, NY 10964

3Department of Physical Oceanography, Woods Hole Oceanographic Institution, Woods Hole, MA 02543.

Achievement_4: Habitat

Achievement 4: A Meso-scale Meteorological Model Hindcast and Forecast

System in the Gulf of Maine/Georges Bank regionMM5

Beardsley R. C1, Changsheng Chen2 and Hu Song2

The fifth-generation NCAR/Penn State mesoscale meteorological model (called MM5) is applied to the Gulf of Maine/Georges Bank (GoM/GB) region. This model is configured with two numerical domains with horizontal resolutions of 30 and 10 km, respectively, and driven by the NCAR-ETA weather model through a nested grid approach. Comparison of model-computed winds, wind stress and heat flux with in-situ data collected on moored meteorological buoys in the western GoM and over GB in 1995 shows that during the passage of atmospheric fronts over this region, MM5 provides a reasonable prediction of wind speed but not wind direction, and relatively accurate estimation of long-wave radiation but overestimates sensible and latent fluxes. The nudging data assimilation approach with inclusion of the in-situ wind data significantly improves the accuracy of the predicted wind speed and direction. Incorporation of the Fairall et al (1996) air-sea flux algorithms with inclusion of AVHRR-derived SST improves the accuracy of the predicted latent and sensible heat fluxes in the GoM/GB region for both stable and unstable weather conditions.

1Department of Physical Oceanography, Woods Hole Oceanographic Institution, Woods Hole, MA 02543. E-mail: rbeardsley@whoi.edu
2School for Marine Science and Technology, University of Massachusetts-Dartmouth, 706 South Rodney French Blvd, New Bedford, MA 02744. E-mail: c1chen@umassd.edu

GOM Summit Survey: Submit Completed Survey

Organization: **Woods Hole Oceanographic Institution**

Address: 45 Water Street

City, State/Province: Woods Hole, MA

Zip/Postal code: 02543

Submitted by: D.M. Anderson, D.J. McGillicuddy, B.A. Keafer, J. Churchill, W.R. Geyer (danderson@whoi.edu) on Thursday, June 03, 2004 at 12:17:22

Achievement_1: Habitat

Achievement_1-Description: This project addressed fundamental issues regarding Alexandrium blooms in the Gulf of Maine utilizing a combination of numerical modeling, hydrographic, chemical, and biological measurements, moored and drifting current measurements, and satellite imagery. The overall goal of this project was to understand and model the dynamics of the toxic dinoflagellate Alexandrium in the Gulf of Maine by investigating the physical, biological, chemical, and behavioral mechanisms underlying population abundance and distribution in several key habitats or regimes and by characterizing the transport pathways that link them.

For the eastern Gulf of Maine region, findings include documentation of the existence of large Alexandrium fundyense populations along the boundaries and the distal end of the eastern segment of the Maine Coastal Current (EMCC), sometimes in dense subsurface layers. The low cell abundances within the nutrient-rich core of the EMCC presumably reflect deep mixing and low light levels. Alexandrium cells within the western segment of the Maine Coastal Current (WMCC) may originate from the EMCC as a result of complex hydrographic interactions (e.g., upwelling, downwelling and subduction) between river plumes and the two coastal currents near Penobscot Bay. One large â seedbedâ of cysts in high concentrations was documented in the deeper waters offshore of Penobscot and Casco Bays, and another in the Bay of Fundy. Model calculations suggest that these seedbeds provide the inoculum of cells needed to initiate blooms in both coastal currents, although an inoculum derived from suspended cysts that survive winter conditions in the water column is also possible. Many other important processes and mechanisms are also detailed, including the transfer of significant amounts of toxins through the food web as a result of grazing, the co-occurrence of spirolide-producing A. ostenfeldii with A. fundyense, and large-scale oceanographic forcings that influence the behavior of the coastal currents and thus the patterns of

Alexandrium abundance and PSP toxicity within the Gulf of Maine.

Achievement_2: Habitat

Achievement 2: Bloom dynamics

Observations from both large-scale and small-scale field surveys indicate long-distance transport and delivery of A. fundyense populations from a near-shore source population in eastern Maine to embayments along the western Maine coastline (e.g. Casco Bay) where local accumulation and retention result in high populations inshore. A. fundyense transport from the eastern Maine source to the western Maine coast is density-driven, influenced by winds and the underlying circulation of the GOM. Persistent downwelling-favorable conditions generally facilitate the rapid alongshore and onshore delivery from east to west by maintaining the population on an â inside trackâ close to the coast where it extends well into the western GOM and interacts with the river plumes. A variety of mechanisms promote the transfer across or around the plume barrier and into Casco Bay. In contrast, persistent upwelling-favorable conditions generally limit the intrusion to the west by shifting the source population offshore, slowing the advance of the population. These dynamics are complex given the variability of the wind, river inputs, and the Maine coastal current structure. Nonetheless, general patterns in the distribution of the A. fundyense population and the associated hydrography clearly demonstrate that there is a linkage between the Casco Bay region and the upstream eastern coastal populations.

Achievement_3: Habitat

Achievement 3: Modeling studies

Synoptic variability in a limited-area coastal domain

A combination of observations and model results in the western Gulf of Maine suggest a mechanism by which coastal blooms of the toxic dinoflagellate A. fundyense can be initiated from dormant cysts located in offshore sediments (McGillicuddy et al. 2003a). The mechanism arises from the joint effects of organism behavior and the wind-driven response of a surface-trapped plume of fresh water originating from riverine sources. During upwelling-favorable winds, the plume thins vertically and extends offshore; downwelling winds thicken the plume and confine it to the nearshore region. In the western Gulf of Maine, the offshore extent of the river plume during upwelling conditions is sufficient to entrain upward-swimming A. fundyense cells germinated from offshore cyst beds. Subsequent downwelling conditions then transport those populations towards the coast. Hetland et al. (2002) elaborate on this mechanism, documenting the degree to which entrainment of cells at the offshore edge of the river plume depends on swimming speed.

Stock et al. (2004) investigate the factors governing the initiation and development of an A. fundyense bloom in the western Gulf of Maine (WGOM) during the spring of

1993. The physical circulation is modeled with a 3D primitive equation model forced by climatological elevation fields and observed winds, irradiance, and river outflow. This is coupled with a biological model constructed from laboratory and field data that estimates the germination and growth rates of A. fundyense as a function of environmental conditions. Four biological model structures of increasing complexity are considered, with each structure representing a hypothesis for factors controlling bloom initiation and development. It is found that the baseline model, which parameterizes growth as only a function of temperature, salinity, and light, severely over-estimates observed A. fundyense abundance in the late spring. This baseline hypothesis is thus rejected with greater than 99% confidence in favor of those that include an additional loss due to spatially and temporally mean mortality, or a dependence of growth on dissolved inorganic nitrogen (DIN). Although the overall best-fit simulation uses both nitrogen dependence and mortality, best simulations using one or the other could not be differentiated from it with better than 90% confidence.

The model captures the general timing and magnitude of the observed bloom and some of its the secondary spatial features. Diagnosis of the cell budget suggests that germination from a large cyst bed offshore of Casco Bay can provide the majority of cells contributing to spring blooms within the WGOM. The size of modeled bloom was largely set by the size of this cyst-driven source. Transport of cells from the eastern Gulf of Maine becomes increasingly important later in the spring, and it may be the dominant source in the summer. Net growth of A. fundyense populations is first limited by low water temperatures, and then by the combined influence of nitrogen and mortality.

Gulf-wide seasonal dynamics based on climatological conditions

Large-scale surveys of A. fundyense undertaken during ECOHAB-GOM indicate three salient characteristics of the vegetative cell distributions: (1) patterns of abundance are gulf-wide in geographic scope, (2) their main features occur in association with the Maine Coastal Current, and (3) the center of mass of the distribution shifts upstream from west to east during the growing season from April to August. The mechanisms underlying these aspects were investigated using coupled physical-biological simulations that represent the population dynamics of A. fundyense within the seasonal mean climatological flow (McGillicuddy et al., 2004b). A model that includes germination, growth, mortality, and nutrient limitation is qualitatively consistent with the observations. Germination from resting cysts appears to be a key aspect of the population dynamics that confine the cell distribution near the coastal margin. In general, cells germinated from the major cyst beds (in the Bay of Fundy and offshore of Penobscot and Casco Bays) are advected in the alongshore direction from east to west in the ambient coastal current. Growth of the vegetative cells is limited primarily by temperature from April through June throughout the gulf, whereas nutrient limitation occurs in July and August in

the western gulf. Thus the seasonal shift in the center of mass of cells from west to east can be explained by changing growth conditions: growth is more rapid in the western gulf early in the season due to warmer temperatures, whereas growth is more rapid in the eastern gulf later in the season due to severe nutrient limitation in the western gulf during that time period. A simple model of encystment based on nutrient limitation predicts deposition of new cysts in the vicinity of the observed cyst bed offshore of Casco and Penobscot Bays, suggesting a pathway of re-seeding the bed from cells advected downstream in the coastal current. Seasonal spinup of a retentive gyre at the mouth of the Bay of Fundy would tend to favor re-seeding that cyst bed from local populations.

Achievement_4: Habitat

Achievement 4: Physical Oceanography

Analysis of the physical oceanographic data focused on aspects of the circulation deemed important in carrying Alexandrium from the presumed source region off the eastern coast of Maine to areas of frequent toxicity outbreaks in western Maine. More specifically, studies concentrated on: conditions under which the EMCC extends into the western Gulf of Maine, the dynamics of the WMCC, and the dynamics controlling the movement of water from the WMCC into Casco Bay.

The study of the latter topic is summarized by Janzen et al. (submitted). Analysis clearly reveals that the manner in which wind stress forces water into and out of the Bay changes dramatically with distance going from the inner shelf to the Bay interior. The transport of off-shore Alexandrium populations into Casco Bay is controlled by a number of factors including forcing by the along-shelf wind (which may carry off-shore populations to the Bay entrance), across-shelf wind forcing (which may carry populations into the Bay interior) and buoyancy forcing associated with the Kenebec River plume (the dynamics of which are still poorly understood).

Study of the WMCC has indicated that while the Current responds to wind-stress forcing in the manner predicted by simple theory, large variations in the Currentâ s strength and direction are often not the result of wind forcing. Baroclinic instability of the current is implicated as a primary cause of such variations with periods of 3 to 10 days. On a longer time scale, a significant interannual variation in the strength of the WMCC is observed. This is tied to differences in the course of the EMCC, which in turn are linked to differences in the water mass distribution of the Gulfâ s interior. These findings are detailed by Churchill et al. (submitted).

Achievement_5: Habitat

Achievement 5: Molecular probes

Three different molecular methods were used with

traditional bright-field microscope techniques to enumerate Alexandrium fundyense in samples collected in the Gulf of Maine. Two molecular probes were used in fluorescent whole-cell (WC) microscopic assays: a large-subunit ribosomal RNA (LSU rRNA) oligonucleotide probe (NA-1) and a monoclonal antibody probe thought to be specific for Alexandrium spp. within the tamarense/catenella/fundyense complex. Cell abundance estimates were also obtained using the NA-1 oligonucleotide probe in a semi-quantitative sandwich hybridization assay (SHA) that quantified target rRNA in cell lysates.

Alexandrium fundyense cell densities obtained using the antibody approach were higher than those using either the NA-1 oligonucleotide or bright field microscopy due to the co-occurrence of A. ostenfeldii with A. fundyense, and the inability of the antibody to discriminate between these two species. For 2001, a dual labeling procedure using two oligonucleotide probes was used to separately enumerate A. ostenfeldii and A. fundyense in the WC format. In addition, the SHA was used in 2001 and 2003 to enumerate A. fundyense. Some agreement was observed between the two oligonucleotide methods, but there were differences as well. Good correlation was observed for surface samples and vertical profiles in May 2001 and June 2003 when the SHA estimates were, on average, equivalent to, and 1.5X the WC counts respectively. The worst correlations were for virtually all samples from the June 2001 cruise where the SHA generally under-estimated the WC counts. Some differences were expected, since the SHA and the WC assays measure different, but related parameters. Additional work is needed to better characterize and intercalibrate these molecular approaches to cell enumeration.

Current project 1: NOAA MERHAB NA16OP2785, Alexandrium Bloom Transport: Observations and Models. PIâ s: D.J. McGillicuddy, D.M. Anderson, B.A., Keafer, WHOI

Our overall objective is to obtain field data on A. fundyense distributions and local hydrodynamics and to interpret those data using existing numerical models and data products from the Gulf of Maine Ocean Observing System to determine if they can be used to provide short-term forecasts of bloom transport.

Current project 2: NOAA ECOHAB NA03NOS4780011, Models of the Toxic Dinoflagellate Alexandrium fundyense in the Gulf of Maine: Quantitative Evaluation, Refinement, and Transition to Operational Mode for Coastal Management. PIâ s: D.J. McGillicuddy, D. M. Anderson, A.R. Solow, WHOI; D. Townsend, UME; V.M. Bricelj, NRD, Canada.

We are evaluating the predictive skill of both statistical and dynamical coupled physical-biological models of A. fundyense in a hindcast mode using data from the three field years of the ECOHAB-GOM program. This will feed into an iterative activity of a model improvement in light

of what is learned in the evaluation. If significant skill is demonstrated, we will construct a plan for transition of the models to operational use.

Current project 3: NSF OCE-0430724 & NIH 1-P50-ES012742-01, The Woods Hole Center for Oceans and Human Health.

Plâ s: D.M. Anderson & D.L. Erdner - Project: Alexandrium Population Biology in the Gulf of Maine

The main objective of this project is to better understand the factors underlying the large variability in toxicity in shellfish that occur temporally and spatially within the Gulf of Maine.

PI: D.J. McGillicuddy â Project: Hydrodynamic Forcing of Alexandrium Population Biology.

The overall goal of this project is to understand the hydrodynamic and biological controls on A. fundyense populations in the Gulf of Maine, their toxin production, and how these factors ultimately determine fluctuatons in shellfish toxicity.

GOM Summit Survey: Submit Completed Survey

Maine

Organization: **Bagaduce Watershed Association**

Address: RR 1 Box 5015

City, State/Province: Sedgwick, ME

Zip/Postal code: 04676

Submitted by: Nonny Ferriday (sakatoux@hypernet.com) on Monday, March 01, 2004 at 14:02:40

Achievement_1: Stewardship

Achievement_1-Description: Organized six Stream Teams (Under Maine stream Team Program)to monitor major streams of the Bagaduce river. Under the direction of Mark Whiting, DEP started collection data in July, 2003 Held six workshops for the teams. They will begin collecting new data this spring.

Achievement_2: Awareness

Achievement 2: Held public meetings topics--_Begining With Habitat_
Sprawl and pollution
Kayaking-safety and enjoyment

Achievement_3: Stewardship

Achievement 3: Organized clean up waterside cleanup on Earth Day

Achievement_4: Maritime activities

Achievement 4: Had a group of four graduate students for U of ME collecting baseline data on the Bagaduce and Northern Bay for two months this past summer. As yet they haven't sent us their report.

Current project 1: Our Stream Team program will be on going.

Current project 2: We hope to have an intern mapping eelgrass and developing a plan to restore eelgrass in Northern Bay this summer.

Organization: **Blue Hill Heritage Trust**

Address: P.O. Box 222

City, State/Province: Blue Hill, ME

Zip/Postal code: 04614

Submitted by: Misha Mytar (mishabhht@downeasr.net) on Wednesday, June 02, 2004 at 08:46:34

Achievement_1: Habitat

Achievement_1-Description: Over the past eighteen years, and with the support of almost 500 members, we have worked to protect 4,106 acres of land with special conservation value on the Blue Hill Peninsula. BHHT owns thirty percent of these acres while the remainder is protected under conservation easements.

GOM Summit Survey: Submit Completed Survey

Organization: **Casco Bay Estuary Project**

Address: 49 Exeter Street

City, State/Province: Portland, Maine

Zip/Postal code: 04102

Submitted by Karen Young (kyoung@usm.maine.edu) on Friday, March 12, 2004 at 11:51:40

Achievement_1: Contaminants

Achievement_1-Description: Over the last several years, the Casco Bay Estuary Project, in partnership with others, has re-opened over 300 acres of soft-shell clam resources to harvest through its _Expanding and Sustaining the Shell fisheries of Casco Bay_ project. The project involved first surveying and prioritizing flats for water quality improvement. The next phase of the project entailed working closely with state and town representatives as well as homeowners to remove 28 of the highest priority overboard discharge waste systems (OBDs) which automatically close flats in the vicinity of these straight-pipe household discharges. In addition, non-point sources of pollution were also investigated. The final phase of the project involved research on sustainable management tools including the factors contributing to flat seeding success and more efficient resource assessment methods. The whole project was guided by a _Clam Team_ of state agency, municipal, non-profit, and industry representatives.

Achievement_2: Habitat

Achievement 2: The Casco Bay Estuary Project (CBEP) Habitat Protection Fund has assisted local land trusts and municipalities with permanent protection of over 2,000 acres of high value habitat in the last two years. The fund provides up to $25,000 per project to assist with land acquisition or conservation easements and can be used for transaction costs, appraisals, surveys, and natural resource assessments, as well as to provide funding for the acquisitons or easements themselves. This funding has helped to leverage larger funding sources by making funding available for necessary activities that other sources won't typcially cover or by being an early donation in the process to help catalyze the project. CBEP works closely with the U.S. Fish and Wildlife Service and Maine Coast Heritage Trust to review proposals, evaluate the habitat values on each property, and identify the highest priorty projects for funding.

Achievement_3: Habitat

Achievement 3: The Casco Bay Estuary Project recently launched a new Habitat Restoration Program to convene interested agencies and stakeholders to partner to facilitate restoration in the Casco Bay watershed. The Habitat Restoration Committee's first project was to identify restoration needs in the watershed. The Committee was recently awarded $25,000 to conduct an inventory of habitat restoration opportunities in the lower Presumpscot River. In addition, the group produced an education fact sheet that was distributed to over 200 stakeholders in an effort to identify local projects and partners. The Committee is also working to improve alewife passage at the Highland Lake dam and has provided funding to the Outer Green Tern Restoration Project in Casco Bay.

Achievement_4: Contaminants

Achievement 4: The Casco Bay Estuary Project, through a collaborative effort with the Cumberland County Soil and Water Conservation District (CCSWCD) and with funding from an EPA Smart Growth grant and the Cumberland County Emergency Management Agency (CCEMA), facilitated a regional collaboration of the eleven municipalities facing NPDES Phase II stormwater regulation in the Casco Bay watershed (Portland, South Portland, Falmouth, Yarmouth, Freeport, Windham, Westbrook, Cape Elizabeth, Gorham, Scarborough, and Cumberland). The municipalities signed an interlocal agreement and have developed a regional stormwater management plan. The municipal partnership (the Casco Bay Interlocal Stormwater Working Group) has formed a strong working relationship and plans to continue to partner on stormwater management through implementation. This effort is building momentum rapidly and has now grown to include three additional Saco Bay municipalities and is also helping to foster a statewide education campaign for stormwater CBEP will continue to work closely with this group to assist with implementation of the regional stormwater plan.

Achievement_5: Contaminants

Achievement 5: The Casco Bay Estuary Project (CBEP), together with the Maine Coastal Program/Maine State Planning Office and Cumberland County Soil and Water Conservation District (CCSWCD) hosted highly successful stormwater conference, â Stormwater Management in Cold Climates: Planning, Design, and Implementationâ November 3-5, 2003 at the Holiday Inn by the Bay in Portland, Maine. The conference brought nearly 400 attendees from across Maine as well as 21 other U.S. states and four other countries. It was the first North American conference

of its kind and drew both national and international experts to share case studies and new technology on the specific challenges of managing stormwater in cold regions. The conference included two days of plenary and concurrent breakout sessions as well as one day of pre-conference training.

Current project 1: The Casco Bay Estuary Project Habitat Restoration Partnership is still in its infancy and will be working with its numerous partners for the forseeable future to identify and facilitate habitat restoration in the Casco Bay watershed by bringing
+ the technical and financial resources of many organizations together with local stakeholders to implement projects.

Current project 2: The Casco Bay Estuary Project recently convened a new CBEP Stormwater Committee in that includes state and federal agencies, municipalities, non-profits, and others. The Stormwater Committeeâ s current priority is to assist municipalities in the region with implementation of their NPDES Phase II stormwater management plans. The Committee's work will be ongoing but has already succeeded in hosting a highly successful Fall 2003 stormwater conference to bring the latest technology and expertise with managing stormwater in cold climates to the region. In addition, CBEP hired a USM doctoral student to assist the Phase II municipalities in seeking grant funds. Finally, the Committee will select priority projects to receive funding and technical assistance beginning in summer 2004.

Current project 3: For the last three and a half years, the Casco Bay Estuary Project has been facilitating and funding technical support for a stakeholder group, the Presumpscot River Watershed Coalition (PRWC), to develop a management plan for the Presumpscot River, _A Plan for the Future of the Presumpscot River_. The plan, which focuses on three areas: fisheries, open space, and cumulative impacts, was finalized in the Fall of 2003 and the partners have already initiated implementation.

GOM Summit Survey: Submit Completed Survey

Organization: **Cove Brook Watershed Council/8 Rivers Roundtable**

Address: 11 Baker Road

City, State/Province: Winterport, ME USA

Zip/Postal code: 04496

Submitted by: Donna M. Gilbert (gilbertdonna@adelphia.net) on Monday, October 11, 2004 at 15:00:19

Achievement_1: Habitat

Achievement_1-Description: In 2002 the Cove Brook Watershed Council received funding from the Maine Shore Stewards the goal of which was to complete an Inventory and Assessment of the watershed. This was completed 18 months later and with the information gathered a watershed management plan was written.

Achievement_2: Contaminants Awareness

Achievement 2: The Cove Brook Watershed Council planned and implemented a free community event, "Lawns & Gardens for a Healthy Coastal Watershed". With guest speakers, demonstrations and displays, low impact gardening methods and resources were made available to the public. Although a blizzard raged on the day of the event, nearly 100 persons attended.

Achievement_3: Stewardship

GOM Summit Survey: Submit Completed Survey

Organization: **Damariscotta River Association**

Address: P.O. Box 333

City, State/Province: Damariscotta, ME

Zip/Postal code: 04543

Submitted by: Steven Hufnagel (steven@draclt.org) on Tuesday, June 01, 2004 at 13:53:45

Achievement_1: Stewardship

Achievement_1-Description: The Damariscotta River Association's Tidewater Watch program for the Damariscotta River Estuary was created in 1988 to monitor water quality and shellfish habitat using citizen volunteers, high school students, and professional aquaculturists who look to the river for their livelihood. The local aquaculture businesses rely on the reports of clean water to gain consumer confidence in their commercially grown products.

Today the program has expanded to include taking water samples for the Department of Marine Resources (DMR) in Boothbay. The data is included in a state-wide water quality analysis conducted by the Wells National Estuarine Research Reserve through the University of Maine Cooperative Extension Clean Water Program and the State Planning Office. The collected data is reformatted and shared with the Department of Environmental Protection. The goal is to report on water quality trends to state resource managers. The data has helped to influence local policies regarding water quality, making the elimination of overboard discharges a priority in a local town, for example.

Achievement_2: Habitat

Achievement 2: DRA has played a role in the protection and stewardship of more than 2,000 acres of land in its 30 year history. Dodge Point and Sherman Lake were two key areas we helped to protect. Recent accomplishments, in partnership with state agencies and with funding from Land for Maine's Future include protecting the 100+ acre Salt Bay Farm on the Great Salt Bay, at the head of the Damariscotta River Estuary, and then creating a freshwater wetland in collaboration with MDIFW and USFWS. DRA also played an important role in the Salt Bay Collaborative to establish the state's first marine protected area and is currently a lead partner in the Damariscotta Mills Alewife Initiative to restore the

historic alewife ladder and viewing platform.

Achievement_3: Awareness

Achievement 3: DRA runs an active lecture series that is free to the public and covers topics ranging from seabird nesting, to estuary health and history, to aquaculture in the river.

Current project 1: DRA is currently fundraising to purchase the Marsh River Bog or Day's Marsh property along Coastal Route 1. Headwaters of the Marsh River, the bog is important to water quality in the Sheepscott River estuary complex. It is also considered significant habitat for federal priority trust waterfowl and bird species and thus received NAWCA small grant funding from USFWS.

Current project 2: DRA recently announced the kick-off of the North Branch Wild Shores Initiative in John's Bay to protect shoreland and intertidal areas. DRA already holds several easements on the North Branch and intends to work with aditional property owners to expand protection.

GOM Summit Survey: Submit Completed Survey

Organization: **Downeast Salmon Federation**

Address: PO Box 201

City, State/Province: Columbia Falls, ME

Zip/Postal code: 04623

Submitted by: Jacob van de Sande (jacob@mainesalmonrivers.org) on Wednesday, June 02, 2004 at 12:08:05

Achievement_1: Habitat

Achievement_1-Description: The DSf has played a leadership role in two dam removals. In 1990 we facilitated the removal of a dam at the head of tide on the Pleasant River that blocked anadramous fish Migration and was not generating power. In 2000 we help to organize the removal of a dam a quarter mile above the head of tide on the East Machias River. We received a presidential award from President Bush for the project in 2002.

Achievement_2: Awareness

Achievement 2: The DSf has been actively involved in educating the public about Atlantic salmon and watershed conservation and restoration since it was founded in 1982. Since 2001 we have had a full time educator working with students and community members through out eastern Maine to raise awareness and understanding of the role humans can play in the demise or conservation and restoration of Atlantic salmon and other aquatic resources. We have reached thousands of students and community members through out Washington County.

Achievement_3: Habitat

Achievement 3: In 2000 the DSF founded the Downeast Rivers Land Trust and since that time has protected approximately 2000 acres including more than 12 miles of frontage on the Downeast salmon rivers. The primary focus of the DRLT is the creation of conservation corridors along the Machias, Pleasant, and Narraguagus Rivers, and Tunk Stream.

Achievement_4: Other

Achievement_4-Other_category: restoring endangered populations

Achievement 4: Since 1991 we have operated a salmon hatchery focused on involving students and community members in the raising and stocking of endangered salmon into the downeast salmon rivers. Involvement in the hatchery fosters empathy and a sense of responsibility on the part of individuals for the health and survival of the salmon (and other public resources).

Current project 1: We are currently involved in facilitating the removal of a set of "tide gates" in Addison, Maine. If removed this could restore as much as 600 acres of salt marsh.

Current project 2: The Downeast Rivers Land trust continues to focus land acquisition on lands adjoining the downeast salmon rivers with a goal of maintaining a healthy riparian buffer along our river corridors.

GOM Summit Survey: Submit Completed Survey

Organization: **East Penobscot Bay Environmental Alliance**

Address: Box 482

City, State/Province: Deer Isle, Maine

Zip/Postal Code: 04627

Submitted by:Jane McCloskey (jmccl@hypernet.com)

Achievement 1: Awareness:

Achievement 1: Habitat

Achievement 1: Stewardship

Achievement1: Contaminants

Achievement: Other_category: Maine regulation of salmon aquaculture
Achievement 1:We have stopped the application for a salmon farm off Little Deer Isle. With a petition we have caused the DMR to rewrite its regulations. We have participated in the MPDS hearings on salmon farm discharges. We have submitted legislation on bay management to them legislature. We have attended and commented on the governor Task Force on Aquaculture.

Achievement 2: Other category
Achievement 2: We have two other projects just in planning stage which we are not yet ready to discuss.

GOM Summit Survey: Submit Completed Survey

Organization: **FairPlay for Harpswell**

Address: PO Box 209

City, State/Province: Harpswell, Maine USA

Zip/Postal code: 04079

Submitted by: Christopher Duval (cduval@mccabe-duval.com) on Monday, September 27, 2004 at 10:55:40

Achievement_1: Habitat Contaminants Maritime activities Awareness Other

Achievement_1-Other_category: preserved jobs for fishermen in our area and the way of life of fishing families

Achievement_1-Description: Our group, FairPlay for Harpswell, was instrumental in defeating the "Fairwinds" LNG terminal that was proposed to be built in our home town of Harpswell Maine.

Working together with the area fishing community and their group, Fishing Families for Harpswell, we worked for nine months, every day, to educate the voters of Harpswell as to what an LNG terminal would have meant for our area.

Our goal was to win the townwide election on the terminal that was held on March 9, 2004. We started working towards this goal in September of 2003, when we first heard about this plan.

Conoco Phillips and TransCanada, the developers of this planned terminal, we going to pay the town $8 million annually to lease the land from the town that they would build on. They spend upwards of $750,000 to win the vote, They had as many as seven full time staffers working in Harpswell to try ang get a yes vote. They had polling, focus groups, out of state ad agencies, lobbying groups, and the state and local governments working to gain a yes vote, and see the terminal built.

Against all of this, we had a determined group of volunteers from our group and Fishing Families for Harpswell. Together, we help public suppers and other events to raise roughly 200.000. Together, we visited just about every house in Harpswell to speak with voters one on one. We held rallies, produced many public access television shows, invited many outside experts to speak in town, paid for a major economic impact study and distributed it to the

entire town, and produced ads, mailers, and flyers to tell the entire town that an LNG terminal would harm the lobster fishermen, it would harm the actual lobster population (because of the planned sea floor pipeline), that it would forever change the character of out town and the surrounding towns and islands (several of which are inhabited year round), and that an LNG terminal did not belong in our town or in Casco Bay.

Our efforts, and those of Fishing Families for Harpswell, were major factors in defeating two multi national energy companies, and in protecting the environment, preserving the fishing community and saving a part of Casco Bay from industrial blight.

GOM Summit Survey: Submit Completed Survey

Organization: **Friends of Acadia**

Address: 43 Cottage St., P.O. Box 45

City, State/Province: Bar Harbor, Maine

Zip/Postal code: 04609

Submitted by: Stephanie Clement (stephanie@friendsofacadia.org) on Wednesday, March 03, 2004 at 10:22:51

Achievement_1: Stewardship

Achievement_1-Description: In 2003, Friends of Acadia sponsored approximately 1,800 volunteers who contributed almost 11,000 volunteer hours to maintaining Acadia National Park's trail and carriage road system, as well as clearing trash from gateway community roads.

Achievement_2: Contaminants Awareness

Achievement 2: Friends of Acadia, L.L. Bean, Acadia National Park, the Maine Department of Transportation, the U.S Department of Transportation, Downeast Transportation, local towns, businesses and visitors successfully carried out the Island Explorer bus system's 5th operating season. The propane-powered bus system carried 340,336 passengers in 2003, reducing nitrogen oxides and volatile organic compounds by approximately 9.3 tons. The bus system also eliminated an estimated 126,000 private vehicle trips in Acadia National Park.

Achievement_3: Awareness

Achievement 3: Friends of Acadia's Ridge Runners and Recreation Intern contacted almost 1,300 visitors on Acadia's trail and carriage road systems with Leave No Trace messages.

Current project 1: Phase 3 of the Island Explorer bus system will include the planning and construction of an off-Mt. Desert Island visitor centre/ multi-modal transportation hub. The centre will provide opportunities for day-use visitors to park their cars, obtain information about Acadia and Downeast Maine, and ride the Island Explorer. The centre will also connect with airports, intercity bus service, and potentially rail and ferries, and will provide parking for commuters. All of this will help reduce traffic congestion and air pollution.

Current project 2: Ridge Runner, Island Explorer, and volunteer programs (described above) are all annual programs of Friends of Acadia.

GOM Summit Survey: Submit Completed Survey

Organization: **Friends of Taunton Bay**

Address: P.O. Box 585

City, State/Province: Bar Harbor, Maine

Zip/Postal code: 04609

Submitted by: Steve Perrin (earthling@acadia.net) on Friday, February 27, 2004 at 07:07:07

Achievement_1: Habitat

Achievement_1-Description: In 2000, Friends of Taunton Bay petitioned the joint Marine Resources Committee of the Maine Legislature to impose a ban on mussel dragging in the bay to protect eelgrass beds. The Legislature issued a 5-year moratorium on dragging, directing the Maine Department of Marine Resources to provide scientific evidence regarding the appropriateness of the moratorium.

Achievement_2: Awareness

Achievement 2: Friends of Taunton Bay supports the Maine Horseshoe Crab Survey as a means of informing the public concerning horseshoe crabs at the northern limit of their breeding range along the Atlantic coast.

Achievement_3: Stewardship

Achievement 3: Friends of Taunton Bay participates in the Maine Toxic Shellfish Early Warning Network.

Achievement_4: Contaminants

Achievement 4: Friends of Taunton Bay has worked with State of Maine agencies to monitor water quality around the bay. This work has led to the replacement of several failed septic systems.

Achievement_5: Maritime activities

Achievement 5: With grant assistance from four groups and foundations, Friends of Taunton Bay joined the Maine Department of Marine Resources in conducting a horseshoe crab tracking study to determine where local horseshoe crabs go in the non-breeding season. This effort was meant to ward off potential dangers from marine resource harvesters.

Current project 1: We are engaged in the process of drafting a strategic plan to make clear our responsibilities in furthering the welfare of Taunton Bay.

Current project 2: We are half-way through our horseshoe crab tracking study. We have found where the crabs winter-over; now we will pick them up again when the ice goes out

and follow them back to their breeding sites.

Current project 3: We continue to monitor transparency, water quality, phytoplankton, and benthic temperature in the bay.

GOM Summit Survey: Submit Completed Survey

Organization: **Georges River Tidewater Association**

Address: P.O. Box 336

City, State/Province: Thomaston, ME

Zip/Postal code: 04861

Achievement_1: Habitat Stewardship

Achievement_1-Description: The mission of the Georges River Tidewater Association is to preserve, protect, and enhance the St. George River estuary in midcoast Maine. Since 1989 our citizen volunteers have collected water samples for fecal coliform analysis by Maine's Department of Marine Resources. We have also partnered with DMR in shoreline surveys and toxic dinoflagellate monitoring. From a low of just a few acres of clam flats open for anything except depuration harvesting in 1989, the estuary now offers over a thousand acres of harvestable flats.

Achievement_2: Habitat Stewardship

Achievement 2: In the early 1990s, in partnership with the Natural Resources Council of Maine and after a failure of longterm negotiations to obtain redress, the GRTA sued the town of Thomaston under provisions of the federal Clean Water Act to force the town to correct its sewer overflows and intermittent discharges of raw and partially treated sewage into the estuary. As a result of this effort, Thomaston separated its stormwater and sewer pipes for the first time and opened a new treatment facility in November 1997. The new lagoon facility discharges treated effluent to the estuary only during the months of January, February, and March. The rest of the year the effluent is impounded or sprayed on town-owned land. This was a critical step in the longterm clean-up of the estuary.

Achievement_3: Habitat Stewardship

Achievement 3: In 2000, again in partnership with the NRCM and this time in partnership with 21 citizens, the GRTA filed suit under the Clean Water Act against the town of Warren. Warren's treatment facility had been in frequent violation of its operating permit since opening in 1992, and in 2000 was poised to accept wastewater from the new state prison then under construction in South Warren. Warren's discharge enters a poorly flushed region of the upper estuary and would have contributed to eutrophication in the volume licensed by the Maine Department of Environmental Protection in 2000. At the same time we appealed that license to the Board of Environmental Protection. Both the appeal and the suit

were resolved by a Consent Agreement in late 2000, as a result of which Warren enlarged its lagoons, instituted best management practices for nitrogen releases, and accepted a reduced summer discharge volume in its operating permit. The net result of our actions against Thomaston and Warren has been that the estuary's two point source discharges have been substantially reduced and improved.

Achievement_4: Habitat Awareness Stewardship

Achievement 4: In the summers of 2001, 2002, and 2003, we have instituted a longterm study of the hydrodynamics, tidal flushing, dissolved oxygen, nutrients, and chlorophyll in the St. George estuary under oversight from Applied Sciences Associates in Rhode Island. We have developed a precise bathymetry of the estuary's bottom and are building an SMS model of the hydrodynamics from an extensive data set collected in the summer and autumn of 2001. Our data on DO and chlorophyll, gathered in the summers of 2001 and 2002, is already extensive, and we will add to it on an ongoing basis. When these reports are worked up and the SMS model completed, the St. George estuary will be the most thoroughly documented estuary on the Maine coast.

GOM Summit Survey: Submit Completed Survey

Organization: **Island Institute**

Address: 386 Main St

City, State/Province: Rockland, ME

Zip/Postal code: 04841

Submitted by: Robert Snyder (rsnyder@islandinstitute.org) on Thursday, July 22, 2004 at 07:10:03

Achievement_1: Maritime activities

Achievement_1-Description: Encouraging sustainable maritime activities
â Between 1996 and 2001 the NOAA funded Penobscot Bay Collaborative brought together over 150 lobstermen and Gulf of Maine scientists to build a bridge between the local knowledge of fishermen and need for more robust datasets from the research community.

Achievement_2: Awareness

Achievement 2: Increasing public awareness and understanding.For the past 10 years the Island Institute has been publishing the Working Waterfront news. We circulation of this paper now tops 30,000. Through the Working Waterfront coastal residents and interested citizens have an opportunity to keep abreast of the social, economic and political issues shaping coastal industries and community sustainability.

Achievement_3: Stewardship

Achievement 3: Enhancing citizen stewardships. Through a partnership with the Maine DMR the Island Institute placed six community based lobster sea samplers in island communities. These Marine Stewards are island community members who have expanded the capacity of the DMR to gather data in these remote areas.

Achievement_4: Other

Achievement_4-Other_category: Island Fellows Program

Achievement 4: The Island Institute Fellows Program provides support for Maineâ s island and remote coastal communities by
1) meeting community-stated needs through project-based work,
2) increasing capacity for the local management of historical, cultural, natural, economic and information resources,
3) assisting local research, planning, education and technology projects,
4) and offering enriching professional development

opportunities for Island Institute Fellows.

There are currently 12 Island Fellows living on Maine's year round communities. In 2003 Island Fellows pursued archival research with historical societies, automation of library holdings, coordination of comprehensive planning efforts, assistance with economic development projects, and research related to fisheries co-management. Foundations, individual donors and others support Island Fellows in residence in host communities, where they provide public service while engaging with and learning from the residents with whom they work. The relationships developed therein enable the Island Institute to better understand and meet the needs of these unique, often isolated island communities.

GOM Summit Survey: Submit Completed Survey

Organization: **Marine Environmental Research Institute**

Gulf of Maine Summit: Achievements Survey

Name: Susan D. Shaw, Dr. P.H., Executive Director
Organization: Marine Environmental Research Institute (MERI)
Address: MERI Center for Marine Studies, 55 Main Street, P.O. Box 1652, Blue Hill, ME 04614
Website: MACROBUTTON HtmlResAnchor www.meriresearch.org
E-mail: MACROBUTTON HtmlResAnchor info@meriresearch.org

MERI's achievements that have resulted in an important change or have made a difference to environmental quality or resource use within the Gulf region:

Achievement One: *Seals as Sentinels for the Gulf of Maine Ecosystem* – Monitoring Toxic Contaminants in Gulf of Maine Seals (2001-2003)

This project was endorsed as a priority project of the Gulf of Maine Council's Environmental Quality Monitoring Committee (GOMC EQMC).

While the *Gulfwatch Program* has provided long-term data about tissue concentrations of contaminants in low trophic level organisms (*i.e.*, blue mussels) in the Gulf of Maine, at present, there is little understanding of the extent of contamination and potential impacts on species at the top of the food chain. Harbor seals (*Phoca vitulina concolor*) are widely distributed in the temperate near shore waters of the Gulf of Maine and are useful sentinels of food chain contamination because they occupy a high trophic level, are long-lived, and accumulate high concentrations of persistent organic pollutants (POPs) and heavy metals including mercury. A large body of data suggests that environmental contaminants, particularly the PCBs, have adversely affected reproduction, endocrine function, and immune function in seals inhabiting industrial coastal regions. The sensitivity of harbor seals to the effects of environmental contaminants first gained widespread attention in 1988 when chemical immune suppression by PCBs was implicated in the virus-related deaths of 20,000 harbor seals in northwestern Europe.

A monitoring effort initiated by the Marine Environmental Research Institute (MERI) in 2001 has generated two years of data on levels and effects of toxic contaminants in harbor seals and gray seals in the Gulf of Maine and along the US Atlantic coast. Tissues obtained from wild (free-ranging) and stranded seals were analyzed for POPs and heavy metals including mercury. The data indicate that harbor seals in the Gulf of Maine accumulate relatively high levels of POPs including PCBs, dioxins, furans, pesticides, lead, and mercury, levels that place them at risk for adverse health effects. The data also suggest the possibility of spatial differences in the distribution and patterns of contaminants ("chemical footprints") in seal tissues.

These are the first extensive data reported on POPs and heavy metals in Gulf of Maine seals in 25

years. Because of their high trophic status, harbor seals ultimately provide information on chemicals which present the greatest risk to consumers at the top of the food chain, including humans.

Achievement Two: Convening of the Gulf of Maine Forum: *Protecting our Coastal and Offshore Waters* in Blue Hill, Maine (2002)

On November 1, 2002, MERI convened the Gulf of Maine Forum: *Protecting Our Coastal and Offshore Waters* in Blue Hill, Maine, in conjunction with the Global Programme of Action Coalition for the Gulf of Maine (GPAC), the Gulf of Maine Council (GOMC), the US National Oceanic and Atmospheric Administration (NOAA), and the Maine Coastal Program (MCP). Fifty-one specialists representing government, academia, NGOs, and business attended the Forum. The Gulf of Maine Forum paralleled the Bay of Fundy Coastal Forum: *The Health of the Bay of Fundy, Assessing Key Issues*, held in Wolfville, Nova Scotia May 13-16, 2002. These two fora provided an opportunity for scientists working in the US Gulf of Maine and the Bay of Fundy, Canada, to participate in the GPAC forum process, which has resulted in a series of twenty community-based, local watershed fora held throughout the Gulf in 2002-03.

The Forum's four major objectives were: 1) to assess current knowledge about the health of the Gulf of Maine environment as well as uncertainties and data gaps that could be filled by future research activities; 2) to review evidence of human-caused changes that have altered important features of the Gulf of Maine environment and identify areas of priority concern; 3) to identify ecological indicators that will be useful in measuring future changes in the health of the Gulf of Maine environment; and 4) to develop the first drafts of a *Gulf of Maine Forum Summary Report*.

The *Gulf of Maine Forum Summary Report*, containing the highlights of the Forum and the Consensus Decisions and Recommendations of the working groups, was published in August 2003 and is now available in PDF format on the MERI website (MACROBUTTON HtmlResAnchor www.meriresearch.org). The Report will be presented at the Gulf of Maine Summit 2004: *State of the Environment Reporting from the Bottom-Up* to be held in October in St. Andrews, New Brunswick.

Severe problems identified by the Forum in the US Gulf of Maine were: **1) Water Quality** -- toxic contaminants in tissue in coastal and estuarine areas, human pathogens associated with sewage, and harmful algal blooms in all areas; **2) Habitats and Species –** benthic habitat, sea grass, wetlands, breeding and spawning areas severely impacted due to direct and indirect impacts of coastal development and human onshore and offshore activities; and **3) Changes in Resource Use –** shifts in targeted species, loss of fisheries diversity, influx of finfish aquaculture, invasive species and impacts from tourism and recreation.

Achievement Three: Establishment of the MERI Center for Marine Studies in Blue Hill, Maine (2001)

Founded in 1990, MERI is a nonprofit organization based in Maine with a mission to protect the marine environment and human health through scientific research, education, and public outreach. The organization provides a broad range of program services to its constituency of 200,000 in mid-

coast Maine and conducts research throughout the Gulf of Maine and along the US Atlantic coast. MERI's research and policy initiatives affect the regulation of toxins and oceans management along the eastern seaboard and internationally.

In 2001, MERI established the Center for Marine Studies in Blue Hill, Maine to expand the organization's operations and research capacity in the Gulf of Maine. The facility houses marine research laboratories, an interpretive public outreach space, sea library and lecture area, oceanarium, marine environmental research library, and staff offices. The Center has quickly become an important resource for the region, serving underserved coastal communities which otherwise lack the resources to confront the complex marine environmental issues they face.

Over the past 14 years, MERI has conducted a series of ecotoxicological investigations examining levels and effects of environmental pollutants in marine mammals along the US Pacific and Atlantic coasts. Current research is primarily focused on a long-term assessment of biomarkers of exposure and effects of endocrine-disrupting contaminants (organic chemicals and metals) in US Atlantic coast pinnipeds (harbor seals and gray seals). *Seals as Sentinels for the Gulf of Maine Ecosystem* , now in its third year, has generated new findings on contamination in species at the top of the marine food chain, and has received attention in the Gulf of Maine and internationally. With support from a Gulf of Maine Council Action Grant in 2003-2004, MERI has been planning the expansion of the study into Downeast Maine and Atlantic Canada (New Brunswick, Nova Scotia).

In recent years, MERI's research and monitoring programs have broadened and include an analysis of contaminants in fish and a water quality monitoring project in the Blue Hill Bay watershed. Current education and outreach programs include eco-tourism in mid-c oast Maine, ocean education programs, ocean lecture series, and special events, including *Earth Day*, *World Ocean Day* and the *Annual Coastweek Cleanup*.

MERI offers up to 10 internships year-round to college students and graduates working toward a career in marine or environmental health sciences, as well as training and mentoring for high school students and younger children. The MERI internship program attracts top scholars throughout the US and Canada, and gives them the opportunity to build their skills as researchers and educators.

Achievement Four: Ocean Lecture Series (2002-2004)

MERI sponsors two ocean lecture series – a monthly *Ocean Environment Lecture Series* and a distinguished lecture series honoring Elisabeth Mann Borgese once or twice annually. The purpose of these programs is to increase public awareness and understanding of critical ocean issues and to enhance stewardship of ocean resources.

Established in 2002 in memory of the late MERI Board member and lifelong advocate of ocean conservation, the *Elisabeth Mann Borgese Lecture Series* annually features internationally-renowned experts on marine pollution, fisheries management, seafood safety, endangered species and ocean conservation. Borgese was the Founder and Honorary Chair of the International Ocean Institute and professor of political science at Dalhousie University in Halifax, NS. Recognized internationally as the "Mother of the Oceans," she was best known as an advocate for the peaceful use of the ocean and its preservation as the common heritage of mankind. She was a nominee for the 2002 Nobel Peace Prize and is credited with the adoption of the 1982 United Nations Convention on the Law of

the Sea. Borgese served on MERI's Board of Directors from 1992 to 2002.

Distinguished speakers have included Dr. Kenneth Black, noted Scottish ecologist and member of the Ministerial Working Group on Aquaculture Strategy for Scotland (2002); Cherie Mason, award-winning author and wildlife advocate (2002); and Dr. Miriam Jacobs of the Royal Veterinary College and the University of Surrey, England (2003).

In 2004, MERI introduced a new monthly *Ocean Environment Lecture Series* offering year-round presentations on topics related to marine wildlife and the ocean environment. This series was created to reach the broader community, and lectures to date have addressed a wide range of subjects, including global climate change, wildlife of Antarctica, and the polar bears of Churchill, Manitoba. Lectures in 2004 will include *Exposure to POPs and Human Health*, and an introduction t o the new *Blue Hill Watershed Monitoring Project* and its relation to the GPAC watershed forums and similar projects throughout the Gulf of Maine.

Achievement Five: Eco-Tourism in Mid-Coast Maine (1992-2004)

Since 1992, MERI educators and naturalists have led ecologically sustainable E co-Tourism programs for all ages in mid-coast Maine. The program has grown significantly and now accesses 17 uninhabited islands in Blue Hill Bay and Eggemoggin Reach. With an emphasis on stewardship of ocean resources, these programs offer an exciting opportunity for children and adults to explore the ecology of the mid-coast archipelago in a responsible, low-impact manner and to gain understanding of human impacts on the coastal environment. Programs include *Island Explorer Trips* for children ages K-12, *Island Excursions* and *Eco-Cruises* for families, and special wildlife charter trips aboard the 33-foot *R/V MERI*. Participants investigate coastal habitats, explore tide pools, identify marine mammals and birds, and learn about the intricate ocean food web.

MERI's ongoing/current projects that have resulted in an important change or have made a difference to environmental quality or resource use within the Gulf region:

Ongoing/Current Project One: *Seals as Sentinels for the Gulf of Maine Ecosystem* – Expanded Monitoring into Downeast Maine and Atlantic Canada (2004-2009)

In 2003, the GOMC awarded MERI an Action Grant to plan the expansion of this program into Downeast Maine and Atlantic Canada (Bay of Fundy). The present proposal is for a pilot project beginning in May 2004 to monitor a wide range of organics and metals in tissues of wild (free-ranging) and stranded harbor seals at selected locations. The pilot project can demonstrate the feasibility of ongoing monitoring and serve as a fundamental and valuable next step toward understanding risks associated with contamination of the Gulf of Maine environment.

The goal of the extended program is to monitor contaminants of concern and health parameters in enough animals over time to provide long-term data for the whole Gulf of Maine. In addition, biomarkers of immune and endocrine function will be monitored in free-ranging seals as measures of

health status that may be linked with contaminant loads. The overall outcome will be the establishment of baseline information about the accumulation of toxic contaminants in a mammalian sentinel species in the Gulf of Maine that will complement information generated in blue mussels by the *Gulfwatch Program*.

Monitoring of contaminants and contaminant-related effects in Gulf of Maine seals is important for 1) managers and policymakers concerned with the extent of contamination in the Gulf of Maine food web; 2) wildlife managers concerned about population or species level impacts; 3) officials charged with remediation and clean-up efforts; and 4) public health officials concerned with the health of human consumer groups that rely heavily on fish consumption.

Accomplishments in 2003-2004 include: the establishment of a network of US-Canadian partners and collaborators; completion of a study design, sampling protocols, and a database for QA/QC; identification of funding sources; and development of an extensive public outreach plan. Expanding the network and training field personnel in sample collection/delivery are ongoing.
US Partners: Members of the GOMC EQMC; University of New England, Dept. of Biology; College of the Atlantic/ Allied Whale; Wadsworth Labs, Albany, NY; Petit Manan National Wildlife Refuge, and the Maine Dept. of Inland Fisheries and Wildlife/Downeast Division. **Canadian Partners:** Members of the GOMC EQMC; University of New Brunswick, Dept. of Biology, St. John; Atlantic Veterinary College, Dept. of Pathology, Prince Edward Island; DFO/Species at Risk/Marine Mammal Division, Dartmouth; and the eastern Canadian Animal Distress Network. **Other Potential Partners:** NOAA/NMFS; Environment Canada, Atlantic Coastal Action Programme (ACAP); and Dalhousie University, Grand Manan Whale and Seabird Research Station.

Endorsed by the GOMC EQMC as a priority project, this monitoring effort addresses **GOMC Action Plan Goal 2**: **Protect Human Health and Ecosystem Integrity, Objective "a"**: Increase awareness and improve management of priority contaminants, including mercury, particularly **Action 36**: "Help to develop and implement a regional marine research plan**...**", and **Action 37**: "Create an expanded environmental quality monitoring strategy that integrates and builds on existing programs such as *Gulfwatch*."

Ongoing/Current Project Two: *The Blue Hill Watershed Monitoring Project* (2004)

In 2004, MERI began the *Blue Hill Watershed Monitoring Project*, the first comprehensive water quality monitoring effort in the Blue Hill watershed. The watershed, extending from the east side of the Blue Hill Peninsula to the west side of Mount Desert Island, is experiencing ecological stress related to population growth along the coast. Increased development and the consequent transformation of the landscape have resulted in pollution, alteration of natural drainage patterns, and fragmentation and destruction of wildlife habitat. Lack of information about the condition of the watershed hinders balanced decision-making on proposals impacting watershed resources and communities.

The design for the 2004 pilot project involves biweekly sampling from 14 saltwater and freshwaters sites from April through October. MERI staff collect and analyze samples, synthesize data, and

translate results in the form of GIS maps, reports and fact sheets. The outreach component of the initiative begins in 2004 and will grow to include additional speakers, panel discussions, GIS mapping presentations, fact sheets, media releases and targeted meetings with individuals and organizations. Upon completion of the first season of field work, methodologies will be refined, sites and parameters will be added and funding will be sought for ongoing monitoring.

In planning the project, MERI has collaborated with the Town of Blue Hill (Board of Selectmen, Marine Resources Committee and Comprehensive Planning Committee), local non-profit organizations, the Department of Environmental Protection, the Department of Marine Resources, the Union River Watershed Coalition and the University of Maine Cooperative Extension/Maine Sea Grant. MERI has also been developing relationships with other stakeholders throughout the watershed, including businesses, universities, local high schools and other watershed protection groups.

Long-term goals for the watershed protection initiative are: 1) to build a broad coalition of stakeholders throughout the watershed; 2) to increase community awareness and understanding of watershed issues; 3) to form a trained volunteer monitoring group; 4) to expand the sampling area; 5) to identify and reduce point and non-point source pollution; and 6) to find ways to sustain the monitoring project in subsequent years. Over time, the *Blue Hill Watershed Monitoring Project* can help lay the foundation for habitat restoration and ecosystem-based management.

This watershed protection initiative resulted from MERI's participation as primary convener of the Gulf of Maine Forum 2002 in conjunction with GOMC and GPAC. It addresses **GOMC Action Plan Goal 1**: **Protect and Restore Coastal and Marine Habitats**, **Goal 2**, particularly **Action 37**: Create an expanded environmental quality monitoring strategy that integrates and builds on existing programs such as Gulfwatch, **Action 43**: Translate research findings about priority, and **Goal 3**, **Objective "a"**: Create and implement a marine research and monitoring strategy that responds to pressing management issues and supports regional economic development.

Ongoing/Current Project Three: Community Outreach for the Callahan Mine Superfund Site in Brooksville, Maine (2003-2004)

In June 2003, the US Environmental Protection Agency (EPA) selected MERI as the primary outreach organization for communities impacted by heavy metal contamination at the Callahan Mine site in Brooksville, Maine, located at the mouth of Penobscot Bay. In this role, MERI has managed the community's Technical Assistance Grant (TAG), which is intended to ensure that the community has a voice in determining that adequate testing is carried out and is informed about health hazards related to the site throughout the remediation process.

This program is authorized under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, enacted by Congress on December 11, 1980. This law provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. In 2002, the EPA

designated the former Callahan Mine a Superfund site based on evidence that toxic metals are contaminating wildlife, fish and shellfish in Penobscot Bay and adjacent wetlands. This area also has been historically contaminated with mercury from the former HoltraChem Manufacturing Company in Orrington, Maine, (1967-2000) located north of the Callahan Mine site on the Penobscot River.

From the 1880s to the early 1970s, the Callahan Mine Site was subjected to intermittent mining for zinc and copper ore. The mining operations were conducted adjacent to and beneath a tidal estuary, reputedly making Callahan Mine the only intertidal heavy metal mining operation in the world at that time. In 1972, the property owner – the Callahan Mining Corporation -- stopped mining the site and undertook efforts to restore the land, including grading, hydro-seeding, and planting vegetation. Those efforts were only partially successful, as much of the site remains barren.

As the primary outreach organization, MERI has provided a number of services to the impacted communities, including 1) establishing a Steering Committee made up of local residents and representatives from watershed and conservation groups throughout the Blue Hill peninsula who are concerned about potential impacts of the mine; 2) holding public information sessions and Steering Committee meetings; 3) disseminating information through the print media and its website; 4) hiring and managing a technical adviser to conduct and interpret additional assessments requested by the community; and 5) serving as the liaison between the communities and relevant state and federal agencies. These services build environmental stewardship in the community and help local residents to better understand the environmental and human health risks related to the site and its remediation.

This project addresses **GOMC Action Plan Goal 2**: **Protect Human Health and Ecosystem Integrity** , particularly **Objective "a"**: Increase awareness and improve management of priority contaminants, and **Objective "c", Action 50**: Support additional stewardship training that addresses contaminant issues for volunteers in each jurisdiction.

Organization: **Maine Sea Grant/Cooperative Extension Marine Extension Team**

Address: 240 Bayview Rd.

City, State/Province: Orr's Island, ME

Zip/Postal code: 04066

Submitted by: Tracy Hart (thart@maine.edu) on Wednesday, May 26, 2004 at 09:03:23

Achievement_1: Habitat Awareness

Achievement_1-Description: Maine Sea Grant co-coordinated and co-sponsored a marine invasive species forum in partnership with the Casco Bay Estuary Project on May 5, 2004. Titled Maineâ s Marine Invasion: The Impact of Non-native and Other Invasive Species on Maineâ s Coastal Ecosystems, the forum was designed to raise public awareness of Maineâ s bioinvasions and energize further collaboration on marine invasive species monitoring, research, management, and education throughout the state. Presentations included the results of a survey for marine invasive species including a number of Maine ports, information about specific bio-invaders, and the potential pathways for their introduction. Action strategies related to early detection and rapid response were drafted in afternoon working sessions. Outcomes of the forum include the development of a working group, action strategy frameworks, media coverage, increased awareness, a marine invasive species listserve, and forum proceedings.

Achievement_2: Awareness

Achievement 2: The Maine Sea Grant/Cooperative Extension Marine Extension Team coordinated and sponsored the 2003 Norâ Easter Ocean Sciences Bowl. The Norâ Easter Bowl is one of 24 regional ocean science competitions held annually as part of the National Ocean Sciences Bowl, sponsored by the Consortium for Oceanographic Research and Education. The program is designed to expose students who excel in math and science to the careers and academic programs in the ocean sciences, increase their knowledge of the oceans, and at the same time raise public awareness of ocean-related issues. Since 2000, the Maine Sea Grant/Cooperative Extension Marine Extension Team has collaborated with the University of Maine School of Marine Sciences, University of New England, University of New Hampshire, and Bigelow Laboratory for Ocean Sciences to coordinate this event. In 2003, the event involved 125 volunteers and 75

students from 10 Maine, New Hampshire, and Vermont schools. Twenty-five sponsors provided $23,250 in cash donations and in-kind donations valuing approximately $27,000, including field trips to prominent regional marine institutions, academic scholarships, books and textbooks, curricula, resource guides, and other educational materials. The winning team from Biddeford High School received an all expense-paid trip to San Diego, California to participate in the national final competition hosted at Scripps Oceanographic Institute and UCSD.

Achievement_3: Habitat Awareness

Achievement 3: The Maine Sea Grant/Cooperative Extension Marine Extension Team facilitated informational sessions on the topic of marine protected areas at the 2003 and 2004 Maine's Fishermen's Forums. The sessions were designed to promote dialogue and provide information on the status, science, management of MPAs in Maine and nationally. A primary goal was to explore opportunities for stakeholder and citizen input into MPA processes within the state. Proceedings are posted on the Maine Sea Grant website. The sessions were precursors to a long-term MPA fisheries extension program that is currently in development.

Achievement_4: Awareness

Achievement 4: In 2003, Maine Sea Grant conducted a survey in the Taunton Bay region leading to the publication Needs and Issues in the Taunton Bay Region: A Survey of Residents from Franklin, Hancock, and Sullivan, Maine. The document is designed to inform local decision-makers, stakeholders, and the public about the issues of greatest local concern and the perceived priorities for research and management in the Taunton Bay region. The survey was distributed to 600 local registered voters. Results of the report:

Â· have been presented at public information sessions and town meetings,

Â· are being used as part of the framework for a local strategic planning effort;

Â· were formally submitted at a public aquaculture lease hearing by both opponents and proponents of the lease;

Â· were featured as a case study at the GPAC local summit for Taunton and Sorrento Bays on the perceived status of marine resources and potential indicators for assessing marine health;

Â· served an important internal function, providing the Marine Extension Team with a map and assessment tool for work in the Taunton Bay region.

Â· are being reviewed by the DMR Commissionerâ s office in relation to the bay management legislation passed by the Marine Resources Committee of the Maine legislature.

Â· have been used by a number of organizations as one model in their efforts to develop needs assessment tools related to community-based programming.

Achievement 5: (I may have time to add more later on Marine Area Characterization Project) Additional achievements to be submitted by MET members: Shore Stewards Program, Phytoplankton Monitoring, Beach Profiling, Silver Wake, Healthy Beaches Monitoring Program, The Gulf of Maine Expedition, etc.)

GOM Summit Survey: Submit Completed Survey

Organization: **Quoddy Regional Land Trust**

Address: P.O. Bos 49

City, State/Province: Whiting, Maine

Zip/Postal code: 04652

Submitted by: Nancy Nielsen (willet@hypernet.com) on Monday, September 27, 2004 at 05:44:09

Achievement_1: Habitat

Achievement_1-Description: The Quoddy Regional Land Trust has worked in the eastern Maine area focused on the Cobscook Bay watershed, eastern Maine salmon river watersheds and Passamaquoddy Bay and has protected coastal, lake and river frontage. Its goals include working to insure continued access to wild lands, to coastal (salt and freshwater) water access and to protection of shore and upland wildlife habitat.

Achievement_2: Awareness

Achievement 2: Accompanying its land protection efforts, QRLT has continued public awareness and education programs to bring the importance of the area's ecological values to residents and visitors.

Achievement_3: Stewardship

Achievement 3: QRLT engages the public in beach cleanup and volunteer stewardship programs.

Achievement_4: Maritime activities

Achievement 4: QRLT manages Cobscook Trails and distributes the Cobscook Trails hiking guide. The Cobscook Trails program includes properties owned by a number of governmental and private conservation entities with developed hiking trails. The program brings substantial economic benefits to the local communities through increased visitor days.

Achievement_5: Other

Achievement_5-Other_category: public school and health-related programs

Achievement 5: Using its recently acquired Mowry Beach property in the Town of Lubec, QRLT is beginning to work in concert with the Lubec school system to involve students in outdoor education programs, trail building and stewardship.

QRLT is working in partnership with the lifelong-health programs of the Regional Medical Center at Lubec to increase outdoor recreation in natural settings.

Current project 1: As a conservation land trust, QRLT's projects are ongoing land acquisition (through ownership and conservation easements), stewardship and education. It is a grassroots, locally based organization and includes support for the area's historic values and ways of life as well as its ecological importance. Land protection, stewardship and education are all interlinked and ongoing with many projects underway at all times.

GOM Summit Survey: Submit Completed Survey

Organization: **Sheepscot Valley Conservation Association**

Address:Sheepscot Road

City,State.Province: Newcastle, ME

Postal code=04553

Submitted by: Michael Herz (svca@sheepscot.org)

Achievement 1-Other category Please specify
Achievement 1-As an advocacy land trust organization the SVCA has worked since 1969 to conserve the natural historic resources of the watershed. One of our current major under-takings is the RiverLink Project which will create a protected wildlife corridor connecting the top riverine habitats in the upper watershed with the estuarine ones at the river mouth. Working with other land trusts we are acquiring land conservation easements to create this corridor.

Achievement 2: Other category
Achievement 2: The Atlantic salmon has been listed as an endangered species in our river. Since long before the listing the SVCA has been working with state federal agencies to acquire or create conservation easements land adjacent to salmon spawning nursery areas create protective buffers to restore damaged habitat. Thus far this program has protected over 12 miles of Sheepscot shoreline.

Achievement 3: Other category
Achievement3: Although the Regional GIS Center began just before the new millennium it is a reflection of the best of 21st century technology. For some time we have been using GIS technology to help us describe our watershed demonstrate to donors landowners about the importance and interconnectedness of sensitive habitats to identify prime salmon habitat for protection acquisition to better understand the hydrology of our river. And most recently we have begun using GIS maps to assist local towns environmental groups in developing their state mandated Comprehensive Plans.

Achievement 4: Other category:
Achievement 4: The SVCA has just completed its 10th year of citizen-based Water Quality Monitoring program. Volunteers participate in collecting weekly samples from 25-35 sites in the watershed using EPA-certified procedures to collect data that have helped agencies identify bacterial sediment temperature dissolved oxygen problems in the river.

Current project 1 All of the above projects are ongoing.
Current project 2
Current project 3

GOM Summit Survey Submit Completed Survey

Organization: **The Chewonki Foundation**

Address: 485 Chewonki Neck Road

City, State/Province: Maine

Zip/Postal code: 04578-4822

Submitted by: Don Hudson (ptgomc@suscom-maine.net)

Achievement_1: Awareness

Achievement_1-Description: Pathways to a Sustainable Future: Pathways is a decade-long educational initiative developed to promote understanding and appreciation for sustainable energy and natural resource management. The first teacher's guide addressed solid waste management issues. A new Renewable Energy Pathways poster and website address sustainable sources of energy. The next in the series will address either sustainable waste water management strategies or sustainable forest management strategies.

Achievement_2: Awareness

Achievement 2: The Wild Gulf Project was created in 1993, published the Wild Gulf Almanac in 1996, and the Wild Gulf Journal in 2000. This project gathered information together in one place to highlight educational resources about habitats and ecosystems in the Gulf of Maine watershed. The project was launched from a platform initiated by the Gulf of Maine Council's GulfLinks. The new Gulf of Maine Council website has incorporated many features of the Almanac and the Journal as a means to keep the information current.

Achievement_3: Habitat

Achievement 3: The Back River Conservation Lands initiative focuses local land conservation priorities for our corner of midcoast Maine to achieve long-term public access to open space and tidal water. This project will result in the permanent protection of over 400 acres of coastal lands, including over a mile of shoreline, and the creation of 6 miles of trails for walking and other muscle-powered sports activities like skiing and biking.

Achievement _4: Awareness

Achievement 4: The Center for Environmental Education was built on Chewonki Neck in Wiscasset, Maine in 1998 and 1999 as the home for all of the public environmental education programs of the Chewonki Foundation. The building won two design awards for _green_ architecture. The travelling natural history programs from the Center reach

over 30,000 children in Maine annually, while over 4,000 children participate in 3 to 5-day residential environmental education programs during the school year.
The Center also provides meeting space for workshops and conferences throughout the year.

Achievement_5: Awareness

Achievement 5: Teaching for the Environment in Higher Education: the Promise of the Earth Charter. Chewonki co-sponsored this symposium with the Center for Respect of Life and Environment of Washington, D.C., with the aim of exploring the role of the United Nations Earth Charter in higher education. 125 participants attended from the United States, Canada, and a dozen other countries in this 3-day program, the proceedings of which were published in the journal Earth Ethics in March 2004.

Current project 1: Pathways to the Sustainable Future: educational materials for sustainable living.

Current project 2: Back River Conservation Lands: on-going land conservation efforts to preserve open space and provide public access for recreation and education.

Current project 3: Montsweag Brook Watershed Project: the decommissioning of Maine Yankee Atomic Power Station and the nearby coal- and oil-fired Mason Station provide the opportunity to remove two small dams and restore a watershed to its natural flow. At least 4 species of anadromous fish will benefit by these dam removals and subsequent restoration of breeding habitat.

GOM Summit Survey: Submit Completed Survey

Organization: **The Lobster Conservancy**

Address: P.O. Box 235/ 6 Waldoboro Rd.

City, State/Province: Friendship

Zip/Postal code: ME

Submitted by: Sara Ellis Ph.D (sara@lobsters.org) on Friday, March 12, 2004 at 09:45:10

Achievement_1: Habitat Maritime activities Awareness Stewardship

Achievement_1-Description: Juvenile Lobster Monitoring Program:
In 1992, TLC founder Diane Cowan documented that juvenile lobsters use the lower intertidal zone as a nursery habitat. This led to the Juvenile Lobster Monitoring Program, the first research program quantifying the distribution and abundance of juvenile lobsters at the intertidal/ subtidal interface. Accessible at the lowest low tides each month, rocks in the lower intertidal zone harbor newly-settled and juvenile lobsters. As these young lobsters will be keepers when caught in lobstermen's traps five to eight years from now, monitoring these lobsters can tell us if the Gulf of Maine's lobster population is increasing, decreasing, or remaining stable. This assessment will help resource managers and the lobstering industry manage the resource sustainably. Since 1997, TLC scientists have been training citizen volunteers to follow a rigorous scientific methodology that provides scientifically credible monitoring data (Cowan 1999; Cowan and Ellis 2001; Ellis and Cowan 2001; Cowan et al. 2003). As of December 2003, four TLC scientists and more than ninety volunteers were conducting monthly surveys at 28 sites from Downeast Maine to Boston Harbor. In this way, the citizen volunteers make possible an affordable, broad geographic census of the next generation of lobsters.

Achievement_2: Habitat Maritime activities Awareness Stewardship

Achievement 2: Lobster Sonar Tracking Project:
Our Lobster Sonar Tracking Project aims to improve understanding of the relationship between egg production and harvest in the Gulf of Maine's lobster fishery and provide this information to Lobster Zone Councils, resource managers, and lobstering communities in order to promote the sustainable management of Maine's most valuable commercial fishery. TLC is accomplishing this by enlisting the lobster harvesters of Muscongus Bay â

one of Maine's most productive embayments for lobsters to track the movements of nearly 300 sonar-tagged female lobsters, map the distribution of lobster spawning and hatching grounds, and test hypotheses to determine where the eggs come from that have sustained the Gulf of Maine's record lobster harvests over the past decade. Our data are beginning to show some interesting patterns, and the lobstermen are enthusiastic about their role as co-researchers.

Achievement_3: Habitat Maritime activities Awareness Stewardship

Achievement 3: Lobster Life Studies Center

In 1998, TLC received a donation of three lobster pounds, associated buildings, and land in Friendship, Maine, and moved its office to this thriving lobstering community. TLC is in the process of developing these properties into a research facility, called the Lobster Life Studies Center, which includes an education facility called the Lobster Learning Center. On Friendship Long Island, we have converted a lobster pound into an observatory where we can test hypotheses about lobster reproductive biology related to resource management. This unique research facility bridges the laboratory environment with the natural environment and connects fishermen with scientists. Lobstermen sample in the bay outside the Lobster Life Studies Center in order to help correlate conditions and behaviors outside the pound with those inside.

Achievement_4: Awareness

Achievement 4: Lobster Literacy Program:

Our Lobster Literacy Program educates the public about the biology and importance of the American lobster. Lobsters are an environmental focal point for coastal residents, but their biology is poorly known. TLC seeks to build environmental awareness and a public stewardship ethic through education programs, such as our Lobster Learning Center on Little Morse Island, classroom and outdoors projects for schools, information networks for decision-makers, and media outreach for the general public.

In 2002, The Lobster Conservancy launched Lobster Larvae in the Classroom, an innovative, hands-on learning experience dealing with the marine environment. Teachers and their students hatch lobster eggs in aquariums and follow the development of larvae into the tiny baby lobsters that settle on the sea floor. Teachers in Friendship, Vinalhaven, Islesford, Isle au Haut and Portland, Maine have used this science project successfully and connected it to language arts, math, and social studies. The students loved the project and eagerly shared their discoveries with their families. TLC is currently developing a Lobster Literacy Curriculum to help spread the program throughout New England.

Current project 1: Since 1995, our Juvenile Lobster Monitoring Project (JLMP) has been training citizen volunteers in a rigorous scientific methodology that censuses lobster nursery sites in the lower intertidal zone. Harboring newly-settled and juvenile lobsters under rocks, these nursery sites are accessible once a month during the lowest low tides, providing a valuable indicator of lobster fishery health â the baby lobsters counted today will be keepers when caught in lobstermen's traps five to eight years from now. Today, 94 citizen scientists supported by 4 TLC staff survey 28 sites from Downeast Maine to Boston Harbor. This volunteer workforce makes possible an affordable census of the next generation of lobsters, which can be used to help manage the resource sustainably.

Current project 2: Our Lobster Sonar Tracking Project aims to improve understanding of the relationship between egg production and harvest in the Gulf of Maine's lobster fishery and provide this information to Lobster Zone Councils, resource managers, and lobstering communities in order to promote the sustainable management of Maine's most valuable commercial fishery. TLC is accomplishing this by enlisting the lobster harvesters of Muscongus Bay â one of Maine's most productive embayments for lobsters to track the movements of nearly 300 sonar-tagged female lobsters, map the distribution of lobster spawning and hatching grounds, and test hypotheses to determine where the eggs come from that have sustained the Gulf of Maine's record lobster harvests over the past decade. Our data are beginning to show some interesting patterns, and the lobstermen are enthusiastic about their role as co-researchers.

Current project 3: In 2002, The Lobster Conservancy launched Lobster Larvae in the Classroom, an innovative, hands-on learning experience dealing with the marine environment. Teachers and their students hatch lobster eggs in aquariums and follow the development of larvae into the tiny baby lobsters that settle on the sea floor. Teachers in Friendship, Vinalhaven, Islesford, Isle au Haut, and Portland, Maine are using this science project successfully and connecting it to language arts, math, and social studies. TLC is currently developing a Lobster Literacy Curriculum to help spread the program throughout New England.

GOM Summit Survey: Submit Completed Survey

Organization: **The Maine Chapter of The Nature Conservancy**

Address: 14 Maine St. Suite 401

City, State/Province: Brunswick, ME

Zip/Postal code: 04011

Submitted by: Joshua Royte (jroyte@tnc.org on Friday, March 05, 2004 at 08:20:17

Achievement_1: Habitat

Achievement_1-Description: St. John River, Machias River, Kennebec River, Saco River, and Merriland River projects to protect lands along these rivers with conservation easements and ecological reserve lands in wide (500 to 1,000-foot) buffers and adjoining preserves.

Achievement_2: Habitat

Achievement 2: Conservation projects for establishing reserves on Great Wass Archepelago and over a dozen other coastal habitats

Achievement_3: Habitat

Achievement 3: Denny's River, West Branch Penobscott River, headwaters on the Sheepscott River.

Achievement_4: Habitat

Achievement 4: Conservation plan for Cobscook Bay both marine and terrestrial conservation.

Achievement_5: Stewardship

Achievement 5: Saco River in Maine and NH from headwaters to first downstream dam in Hiram. River monitors, stewards, and educators.

Current project 1: Narraguagus River/Spring River; Buffering the river and creating some adjoining ecological reserve areas surrounding existing BPL and IFW reserve lands.

Current project 2: St. John River; Continuing to purchase buffering lands along the St. John River including a reserve around the headwater St. John Ponds and over 75 miles of stream shore buffers heading down stream towards the town of Allagash.

Current project 3: Kennebec River and Estuary: diversity of conservation projects of estuary marshes, buffering uplands, and connected upland habitats for wildlife; restoration of salt marsh habitat; invasive species inventory, monitoring, and management.

GOM Summit Survey: Submit Completed Survey

Organization: **The Ocean Conservancy-New England Regional Office**

Address: 19 Commercial Street

City, State/Province: Portland, Maine

Zip/Postal code: 04101

Submitted by: Susan Farady (susan.farady@verizon.net) on Friday, June 25, 2004 at 09:29:02

Achievement_1: Habitat Awareness Stewardship

Achievement_1-Description: The Ocean Conservancy mapped and evaluated the marine and coastal protected areas in the U.S. Gulf of Maine region. Over 300 sites in the U.S. portion of the Gulf, its coastal drainage area, and Georges Bank were analyzed. A full-color report (2001) and accompanying poster (2003) illustrate the results and recommends several actions towards more effective utilization of marine protected areas to manage and protect the marine environment and stakeholder participation in MPA designation, monitoring and management.
We have used these products to provide clear information and maps to stakeholders on MPAs, oftentimes a confusing and controversial issue.

Achievement_2: Habitat Maritime activities Awareness

Achievement 2: The Ocean Conservancy works to promote sustainable fishery management and habitat protection through its' participation in regional fishery management activities.
We worked to implement a U.S. plan beginning in 2004 to stop overfishing of the region's important groundfish stocks, and participate in many efforts to utilize scientific information and stakeholder participation to protect fish as well as fishermen and the ecosystems we all depend on.

Achievement_3: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 3: The Ocean Conservancy has been a member of the Maine Clean Marinas Program stakeholder advisory panel since its' inception in 2000. This program works with marina and boatyard owners to encourage best management practices to reduce nonpoint source pollution and other pollution from boatyard and marina activities. The Program has grown from a successful pilot project in Casco Bay, Maine to expand to the midcoast and Penobscot Bay region, with a strategic plan developed to implement the program statewide, including inland waters and with a boater education component. The Program's motto, 'Clean Water is Good Business.' illustrates the

stakeholder investment in the Program that has made it a success.

Achievement_4: Habitat Contaminants Awareness Stewardship

Achievement 4: The Ocean Conservancy has been working since our New England office opened in 1999 to improve the effectiveness of existing marine protected areas, and to call for better stakeholder processes and management to manage current sites and designate new ones. These efforts include: working to improve the conservation effectiveness of New England's only National Marine Sanctuary, Stellwagen Bank, and educate citizens about this site and how to participate in its' management; voicing our support in 2001 with Canadian environmental colleagues for the designation of a site to protect deep sea corals from certain fishing practices; and partnering with both US and Canadian organizations in 2002 to conduct a Gulf-wide public opinion poll on perceptions regarding marine protected areas.

Achievement_5: Habitat Awareness Stewardship Other

Achievement_5-Other_category: Supporting marine-related education

Achievement 5: The Ocean Conservancy participates in and supports many educational efforts that help educate the next generation of ocean citizens. We have volunteered and sponsored regional US National Ocean Science Bowls for high school students since we opened our regional office in 1999. We also provide presentations on ocean-related topics at regional US high school, college and post-graduate institutions. We distribute our informative magazine, Blue Planet Quarterly, to educators, students and citizens. Finally, as the founder and host of the annual International Coastal Cleanup, the largest single volunteer activity in the world, we work with state, provincial and local communities in the Gulf of Maine every September (and in some communities throughout the year) to collect and monitor marine debris from Gulf of Maine shorelines and educate citizens.

Current project 1: Working to reform ocean management following the recommendations of the US Ocean Commission and the Pew Oceans Commission at state, regional and federal levels.

Current project 2: Continued work on fishery management and habitat protection.

Current project 3: Continued work on MPAs, including Stellwagen Bank National Marine Sanctuary.

GOM Summit Survey: Submit Completed Survey

Organization: **Union River Watershed Coalition**

Address: 105 Eden St.

City, State/Province: Bar Harbor, ME

Zip/Postal code: 04609

Submitted by: Travis Hussey (thussey@coa.edu) on Tuesday, October 05, 2004 at 07:40:59

Achievement_1: Awareness

Achievement_1-Description: Designed large "Union River Watershed" road signs and installed over 30 of them at road crossings that identify the river and its branches, as well as where roads enter the watershed boundary. The project took some time to develop, but has certainly raised public awareness of the river and the watershed concept!

Achievement_2: Stewardship

Achievement 2: We have been organizing an annual stream clean-up of Card Brook, a tributary to the Union River. The brook flows under "The Strip" in the middle of Ellsworth's sprawl of malls, restaurants, and gas stations. Volunteers routinely pull out shopping carts, tires, and other trash from this section of the brook, which suffers from an abrupt transition from natural meadow to intense development. In one of the earlier years they filled 2 dump trucks full of junk!

Achievement_3: Stewardship

Achievement 3: Our most extensive project to date! We are wrapping up our second year of baseline water quality monitoring within the watershed. Unlike other monitoring programs, we surveyed the community to discover what they were interested in finding out concerning the water quality. The result? A broad spectrum of parameters from the standard Dissolved Oxygen and pH readings to extended-deployment temperature loggers, fecal coliform, macroinvertebrate and habitat surveys, acres in conservation vs. agricultural, industrial, or residential use, recreational access, presence of invasive species, historic remnants, and other unique parameters. Involving the community through project design and volunteer data collection is a sure way to maintain interest and involvement in their local resource.

GOM Summit Survey: Submit Completed Survey

Organization: University of Southern Maine - Census of Marine Life

Address: P.O. Box 9300

City, State/Province: Portland, ME

Zip/Postal code: 04104-9300

Submitted by: Evan Richert (erichert@usm.maine.edu) on Monday, June 14, 2004 at 07:16:58

Achievement_1: Habitat

Achievement_1-Description: The Gulf of Maine Census of Marine Life has demonstrated the capability to bring toghether biological and physical oceanographic data to create biogeographic maps of the Gulf of Maine. The demonstration has resulted in publication of "Prototype Biophysical Maps of the Gulf of Maine" and, by fall 2004, a Dynamic Fisheries Atlas of the Gulf of Maine will be available on the Internet.

Achievement_2: Habitat

Achievement 2: The Gulf of Maine Census of Marine Life coordinated the creation of the Gulf of Maine Ocean Data Partnership to enable a distributed system of continuous sharing of data bases on the biology, oceanography, and geology of the Gulf of Maine. The Partnership, which is open-ended, was founded in spring 2004, and its first chairman is David Mountain of the Northeast Fisheries Science Center. The Gulf of Maine Ocean Observing System is hosting the partnership.

GOM Summit Survey: Submit Completed Survey

Organization: **Vinalhaven Land Trust**

Address: PO Box 268

City, State/Province: Vinalhaven, ME

Zip/Postal code: 04863

Submitted by: Linnell Mather (vlt@foxisland.net) Tuesday, March 09, 2004 at 12:06:03

Achievement_1: Habitat

Achievement_1-Description: In late 2004, VLT was gifted Jennings Island in Mill River, Vinalhaven. This ensures the protection of over 5000'of shoreline, and a small lowland salt marsh. The 5.78 acre island has several flat rocks, traditional picnic spots.

Achievement_2: Contaminants

Achievement 2: In 2003, VLT was gifted an 80 acre parcel, three fourth's of which is in the watershed for the Town's public water supply. Since the island is a sole source aquifer, meaning our only source of water is rainfall, the protection of the watershed is essential.

Achievement_3: Awareness

Achievement 3: VLT has an active environmental education program in the school, offering something for every grade K-12. We also have a series of very well attended walks and talks in the summer and fall.

Achievement_4: Contaminants

Achievement 4: VLT,in coperation with Maine Coast Heritage Trust, has been actively working on the 'whole place' protection of areas of Vinalhaven, particularly Seal Bay, and the Basin. Much protection has been done in these areas, but more remains to be accomplished. In the very near future, we hope to announce the creation of the Carrying Place Bridge Preserve, on Seal Bay.

Achievement_5: Habitat

Achievement 5: In the late 1990's, VLT helped assured the protection of the Brimstone Archipelago of Class A seabird nesting islands by purchasing Roberts Island, which we then donated to US Fish and Wildlife, and assuring the protection of the islands in the string that were not already protected.

Current project 1: VLT is very involved in helping the town of Vinalhaven draft a new comprehensive plan. The board of VLT voted to assist the town by providing matching funds for a grant, and by providing state of the art GIS maps for the Natural Resources

Inventory.

Current project 2: We have many ongoing projects involving land and resource protection, as well as continuing environmental education programs.

GOM Summit Survey: Submit Completed Survey

Organization: **Wells NERR Coastal Training Program**

Address: 342 Laudholm Farm Rd.

City, State/Province: Wells, Maine

Zip/Postal code: 04043

Achievement_1: Habitat Awareness Stewardship

Achievement_1-Description: The Coastal Training and Information Program (CTIP) of the Wells National Estuarine Research Reserve has organized and implemented workshops to support salt marsh restoration in the Gulf of Maine. In 2003 the Barriers and Bridges to Salt Marsh Restoration Workshop gathered salt marsh restoration professions from across the Gulf to share recent research results and methodologies. In 2004 CTIP presented the Ribbons of Green workshop for communities interested in learning about salt marsh restoration opportunities and methods to achieve conservation of locally important coastal wetlands.

Current project 1: The Coastal Training and Information Program (CTIP) of the Wells National Estuarine Research Reserve is dedicated to the design, implementation and evaluation of effective science translation in support of coastal decision making. Through workshops, web-based forums, and innovative education and outreach strategies CTIP aims to foster community based conservation and sustainable management of coastal resources. Emphasizing informed decision making, public participation and integration of expert and lay knowledge CTIP recognizes the importance of place-based efforts to monitor and protect locally valued natural resources.

GOM Summit Survey: Submit Completed Survey

New Hampshire

Organization: **Center for Coastal and Ocean Mapping University of New Hampshire**

Address: 24 Colovos Rd University of New Hampshire

City, State/Province: Durham NH

Zip/Postal code: 03824

Submitted by: Larry Mayer, Mashkoor Malik (lmayer@unh.edu) on Wednesday, June 02, 2004 at 09:03:52

Achievement_1-Other_category: mapping in support of all of the above

Achievement_1-Description: We have made detailed maps in a region of the Gulf of Maine (Jeffreys Ledge) that stradles an open and closed area. These maps have been made at increasing levels of resolution so that we may better understand the levels of resolution needed to derive the information necessary for understanding the impact of both fishing and closures. The acoustic mapping data has been supplimented by video and sampling (done by Grizzle and Ward). We have been able to identify a series of seafloor features in both the open and closed area that we believe to represent the result of scallop dredging. Future studies will allow us to positively identify the origin of these features as well as understand their persistence.

GOM Summit Survey: Submit Completed Survey

Organization: **Coastal Conservation Association of NH** ph:603-731-2669

Address: P/O Box 4084

City, State/Province: Concord, NH.

Zip/Postal code: 03302-4084

Achievement_1: Habitat

Achievement_1- Participated in a habitat restoration project on the Winnacut River in Greenland, NH. Members working under directions of a marine biologist, removed obstructions in Smelt Spawning areas in the lower river

Achievement_2: Habitat

Achievement 2: Working closely with the NH.Fish & Game Dept.and the US Fish & Wildlife Service in monitoring the operations of dams on rivers leading to the Great Bay Esturary. These include the Salmon Falls, Cocheco, and Exeter Rivers, which are keys to the ongoing restoration of Shad,Alewife and River Herring to the Gulf of Maine

Achievement_3: Habitat

Achievement 3: Pledged $2,500.00 for the Wiswall Dam Restoration Program which will remove the dam, or help build a new fish ladder their.

Current project 1: Work with NH. Fish & Game inan effort to increase participation in the Striped Bass Angler Survey Program

Current project 2: To continue providing funding, and volunteer effort, seeking matching grants, to removal of head of tide dams.

Current project 3: CCANH Mission Statement

To advise and educate the public on the conservation of marine, animal, and plant life, and other coastal resources, both onshore, and offshore. The objective is to promote, protect ,and enhance the present and future availability of these coastal resources for the benefit and enjoyment of the general public.

GOM Summit Survey: Submit Completed Survey

Nova Scotia

Organization: **Acadia Centre for Estuarine Research**

Address: Acadia University,

City, State/Province: Wolfville, Nova Scotia, Canada

Zip/Postal code: B4P 2R6

Submitted by: Dr. Graham R. Daborn (graham.daborn@acadiau.ca) on Sunday, April 04, 2004 at 13:51:23

Achievement_1: Awareness Stewardship Other

Achievement_1-Description: The Acadia Centre for Estuarine Research (ACER) was involved in the design of the Atlantic Coastal Action Program (ACAP), particularly the establishment of the Clean Annapolis River Project Society (CARP), whose mandate is to manage the environment of the Annapolis River watershed. ACER provides training for the River Guardians who monitor water quality in the river, has provided information by writing more than 50 "Annapolis River Issues" and served on the Board of Directors for many years.

Achievement_2: Awareness Stewardship Other

Achievement 2: ACER personnel were principals in the establishment of the Bay of Fundy Ecosystem Partnership (BoFEP), and ACER has provided the home base for BoFEP, its Chair, and the Chairs of several Working Groups, since 1997. We organise the biennial Bay of Fundy workshops, and numerous other special meetings related to understanding, protecting, and sustainably using the resources of the Bay of Fundy.

Achievement_3: Stewardship

Achievement_3-Other_category: Basic environmental research

Achievement 3: ACER has conducted original research on the Bay of Fundy since 1985. Research topics include: effects of barriers on sediment dynamics and fish passage; ecology of mudflats, saltmarshes, fish, invertebrates and birds; ecology of tributary rivers and their watersheds; effects of acid rain; watershed management; groundwater dynamics in saltmarshes; eutrophication; etc. All results are published in scientific literature, and disseminated through public meetings, community presentations etc.

Achievement_4: Habitat
Achievement_4-Other_category: policy development
Achievement 4: ACER personnel have played significant roles in the development of public policy, including the Nova Scotia _Coastal 2000 policy, and NS water policy.

Current project 1: Developing an Integrated Management Plan for the Fisheries Resources of the Inner Bay of Fundy. Funded by the ELJB Foundation, this new project involves the Bay of Fundy Marine

Resource Centre, the Department of Fisheries and Oceans, Environment Canada, and the Nova Scotia Department of Fisheries and Aquaculture.

Current project 2: Understanding the environmental effects of construction of the Windsor Causeway across the Avon River, and the implications of twinning Highway 101.

Current project 3: Understanding the dynamic behaviour of estuarine sediments in macrotidal environments, and the biophysical factors that control sediment movements and deposition.

GOM Summit Survey: Submit Completed Survey

Organization: **Bay of Fundy Ecosystem Partnership (BoFEP)**

Address: Acadia Centre for Estuarine Research, Acadia University, Box 115

City, State/Province: Wolfville, Nova Scotia

Zip/Postal code: B4P 2R6

Submitted by: Amanda Tree (amanda.tree@acadiau.ca) on Thursday, June 10, 2004 at 11:34:06

Achievement_1: Habitat Maritime activities Awareness

Achievement_1-Description: Establishment of 18 Working Groups to
a) Develop new information about Bay of Fundy issues;
b) Preparation of action plans to address issues;
c) Dissemination of results through reports and publications;
d) Organization of consensus-building public fora;
e) Cooperation with other NGOs and government agencies.

Achievement_2: Awareness

Achievement 2: Publication of 25 information bulletins in the Fundy Issues series (http://www.bofep.org/fundy_issues.htm).

Achievement_3: Awareness

Achievement 3: Organization of 5 biennial international meetings to discuss science and issues affecting the Bay, with attendance of 100-200 people at each. The 6th Bay of Fundy Workshop is being planned for September 29 to October 2, 2004.

Achievement_4: Awareness

Achievement 4: Maintenance of updated website containing: organizational information; committee membership information; minutes and reports of committees and working groups; membership application information; reports of conferences and workshops.

Current project 1: The 6th Bay of Fundy Workshop "The Changing Bay of Fundy: Beyond 400 Years" September 29 - October 2nd, 2004
Annapolis Basin Conference Centre, Cornwallis Park, Nova Scotia.

This Workshop is the sixth in the series on the Bay of Fundy, organized by the Bay of Fundy Ecosystem Partnership (BoFEP). It coincides with the commemoration of the 400th anniversary of the

arrival of French explorers in 1604 and the establishment of the first permanent European settlement in Canada at nearby Port Royal in 1605. The workshop theme encourages us to reflect on the changes in the ecosystems of the Bay and its surrounding watersheds before and during these four centuries of expanding European settlement. More importantly, it inspires us to explore the ecological and social changes that may take place in the region during the next hundred years.

The Workshop is an opportunity to present original research papers, synoptic reviews, viewpoint papers, posters and project demonstrations. Panel discussions and round table sessions will encourage participants to reflect on ecological changes that have already taken place and share ideas about what needs to be done to protect or restore the Bayâ s productivity and diversity in coming decades. Presentations may deal with aspects of the physical, chemical, biological and social science relevant to the Bay of Fundy, particularly on topics pertaining to:

Coastal/watershed issues affecting communities.
Human and natural history of Fundy.
Economics of natural resources, past and present.
Fisheries and aquaculture.
Wildlife biology and habitat conservation.
Ecology and ecosystem health.
Education: communities, schools and marine science.

Marine and coastal protected areas.
Partnerships: working together for sustainability.
Watersheds and land-based impacts on the Bay.
Natural changes and effects of human activities.
Issues in marine governance.
Information technology: new tools new approaches.
Suggestions for other topics are welcome.

GOM Summit Survey: Submit Completed Survey

Organization: **Bay of Fundy Ecosystem Partnership/Minas Basin Working Group**

Address: Acadia Centre for Estuarine Research, Acadia Univesity

City, State/Province: Wolfville, Nova Scotia

Zip/Postal code: B4P 2R6

Submitted by: Michael Brylinsky (mike.brylinsky@acadiau.ca) on Friday, March 26, 2004 at 10:59:36

Achievement_1: Habitat Maritime activities

Achievement_1-Description: Carried out a series of public community forums, attended by more than 500 persons, within the Minas Basin watershed to identify issues and actions required to develop an ecosystem based management strategy to ensure sustainable resource use within the Minas Basin watershed. This culminated in a series of documents listing the concerns and ideas of the participants as well as a comprehensive data base on a number of ecological, social and economic parameters within the watershed.

Achievement_2: Stewardship

Achievement 2: Organized a two day workshop for community group leaders located within the Minas Basin watershed focusing on how to develop the work and action plans required to move forward in dealing effectively with resource management issues.

Achievement_3-Other_category: Sate of the Health Workshop

Achievement 3: Organized and carried out a forum to evaluate the 'State of the Minas Basin', as part of the GPAC program.

Achievement_4-Other_category: Provision of co-ordinator for community groups

Achievement 4: Funded a co-ordinator to work specifically with community groups in developing and implementing action and work plans.

Achievement_5: Awareness

Current project 1: Organization of 'Water' Workshop and Seminar focused on the Southern Bight of the Minas Basin.

Current project 2: Organization of a panel discussion on the ecological impacts of removing the Windsor, Nova Scotia causeway.

Current project 3: Participation in development of a Marine Resource Centre focusing on the upper Bay of Fundy system.

GOM Summit Survey: Submit Completed Survey

Organization: **Bedford Institute of Oceanography**

Address: P.O. 1006

City, State/Province: Dartmouth, Nova Scotia

Zip/Postal code: B2Y 4A2

Submitted by: Peter C. Smith (SmithPC@mar.dfo-mpo.gc.ca) on Wednesday, June 09, 2004 at 13:29:06

Achievement_1: Other

Achievement_1-Other_category: Understanding basic physical processes

Achievement_1-Description: "Interannual variability of boundary fluxes and water mass properties in the Gulf of Maine and on Georges Bank: 1993-97", DSR II 48 (2001), 37-70. Observations of volumetric and freshwater fluxes into the Gulf of Maine indicate dramatic interannual and interdecadal changes. Average volumetric transports off Nova Scotia (in Northeast Channel) were double(half) that in the late '70s, though the total was similar. "Flushing time" for the Gulf as a whole was estimated at 1 year. Further, the net change in freshwater flux ('94-'97) exceeded the climatological mean, consistent with a net drop in salinity of 0.73 on Georges Bank. Forcing for these changes may be related to the North Atlantic Oscillation (NAO).

Achievement_2: Other

Achievement_2-Other_category: Understanding basic physical processes

Achievement 2: "Scotian Shelf crossovers during winter/spring 1999" (2003)JGR 108(11, 8013. Processes by which surface waters on Browns Bank "crossover" to Georges, carrying anomalous properties and biota, were investigated using moored instruments, surface drifters, and satellite imagery. Roughly 20% of the drifters penetrated the 100 m isobath on Georges, requiring 2-26 days for transit and "residing" on the Bank for 3-4 weeks. Mesoscale baroclinic eddies in Northeast Channel and/or offshore winds are considered to be the most likely driving forces for this exchange.

Current project 1: Developing surface wave forecast model for the Gulf of Maine. Sponsored by GoMOOS, a team of investigators from BIO is developing and validating a surface wave forecast model for eventual transfer to an operational agency.

GOM Summit Survey: Submit Completed Survey

Organization: **Centre for Water Resources Studies, Dalhousie University**

Address: 1360 Barrington Street

City, State/Province: Halifax, NS

Zip/Postal code: B3J 2X4

Submitted by: Dr. D. H. Waller (donald.waller@dal.ca) on Thursday, June 24, 2004 at 10:35:35

Achievement_1: Contaminants Maritime activities Awareness Stewardship

Achievement_1-Description: Shubenacadie River Headwaters trophic status Management, 1991-1994. The public was engaged over a 2 year period to determine their goals for long term water quality in the headwater region. Public feedback was then used to develop long term planning and management strategies for more sustainable water use.

Achievement_2: Habitat Contaminants

Achievement 2: Nova Scotia On-Site Wastewater Applied Research Program, conducted since 1984 on behalf of departments of Nova Scotia government, in consultation and collaboration with agencies, organizations and individuals who represent all of these responsible for or affected by on-site wastewater management in Nova Scotia

Achievement_3: Habitat

Achievement 3: Erosion & Sediment control for Construction Sites: CWRS recently received an international award for activities that have included field projects, workshops, and courses that have trained employees and contractors of municipal and provincial agencies in effective erosion and sediment control.

GOM Summit Survey: Submit Completed Survey

Organization: **Clean Annapolis River Project**

Address: PO Box 395

City, State/Province: Annapolis Royal, NS

Zip/Postal code: B0S 1A0

Submitted by: Stephen Hawboldt (carp@annapolisriver.ca) on Wednesday, March 24, 2004 at 12:03:21

Achievement_1: Stewardship

Achievement_1-Description: CARP has operated a volunteer-based water quality monitoring program since 1992. The Annapolis River Guardians is likely the first such program in Eastern Canada. Have trained 300+ volunteers and collected over 1,600 water samples. Data in available via the Internet at www.fundybay.com

Achievement_2: Habitat

Achievement 2: Habitat restoration programs have been ongoing since 1993. Over 10,000 metres of fish habitat restored, over 15,000 trees planted in riparian zones. 10,000 meters of stream bank fenced to prevent uncontrolled animal access, installed alternate livestock watering systems and constructed stream crossings for livestock.

Achievement_3: Habitat

Achievement 3: been involved in the construction of over 100 hectares of constructed wetlands including one 20 hectrar wetland to provide tretiary treatment of municipal waste water. Projects have included prevention of uncontrolled farm animal access and nest boxes for waterfowl, swallows, hawks and other species.

Achievement_4: Habitat

Achievement 4: have protect approximately 20 hectrares of salt marsh with signed stewardship agreements and had another 10 hectares of salt marsh donated to CARP.

Achievement_5: Awareness

Achievement 5: Have conducted hundreds of public awareness sessions since 1991. An average of about 75 are held throughout each year and they involve all sectors, age groups and agencies. Thousands of brochures and pamplets have been distributed. Maintains two website. www.annapolisriver.ca and www.fundybay.com

Current project 1: Working with farmers to reduce greenhouse gas emissions by supporting energy conservation programs.

Current project 2: Completing projections and policy implications review on climate change in the Annapolis Valley.

Current project 3: Working with several government agencies to solve very serious pollution problems arising from poorly functioning on-site systems.

GOM Summit Survey: Submit Completed Survey

Organization: **Dr. Arthur Hines School**

Address: Summerville

City, State/Province: Hants County, Nova Scotia

Zip/Postal code: Bon2R0

Submitted by: Hazel Dill on Monday, March 29, 2004 at 15:00:23

Achievement_1: Habitat

Achievement_1-Description: Dr. Arthur Hines School has been a member of the Blue School Program since 1998. Each year all of the students in the school travel to the local beaches. We focus on four areas: explore, study, care and protect. .Each year we build on what was done the year before. We involve students , parents and community members.

Achievement_2: Maritime activities

Achievement 2: Students in the school have written to the Department of Fisheries and Oceans and expressed their concerns re the marine worm harvesting that is taking place ont he mud flats of the Minas Basin

Achievement_3: Awareness

Achievement 3: Students and staff are working with the Ecology Action Center on their saltmarsh restoration project at the Cheverie Creek. The school has hosted a Community forum on the Minas Basin watershed .

Achievement_4: Stewardship

Achievement 4: The students of DAHS are encouraged to learn about stewardship and to be responsible for developing and understanding of the valuable diverse ecosystems they have in their back yards along the shores of the Minas Basin.

Current project 1: The students and staff recently received an Artsmart grant that focuses on Exploring the Salt Marsh. The project is intergrating curriculum and has brought students, teachers, artists and scientists together. Students in grades 5 and 6, under the direction of their teachers, are working with artists and members of the Ecology Action Center to produce a video and recreate the flora and fauna of the salt marsh through paper mache. When the projects are complete we will share them with the rest of the school and the school community.

Current project 2: All students in the school will participate in Ocean Day activities in June. Students travel to the

beaches and spend the day cleaning up and learning about the history and habitats of the local beaches.

Current project 3: The school has built a partnership with the Ecology Action Center. members from the EAC have visited the school to share their work on the salt marsh. They have also participated in our Ocean Day activities.

GOM Summit Survey: Submit Completed Survey

Organization: **Eastern Habitat Joint Venture (Nova Scotia)**

Address: NSDNR, 136 Exhibition Sreet

City, State/Province: Kentville, Nova Scotia

Zip/Postal code: B4N 4E5

Submitted by: Reg. Newell (newellrb@gov.ns.ca) on Wednesday, May 12, 2004 at 13:06:36

Achievement_1: Habitat

Achievement_1-Description: Riparian Fencing Project

The Riparian Fencing Project is designed to encourage livestock producers to fence off livestock access to wetlands (including salt marshes) and waterways and to leave a buffer strip (riparian edge) around these areas. The fencing projects, including alternative water systems and stream crossings, are a cost sharing effort with livestock producers in which the NS-EHJV pays up to 40% of the initial total cost of the project (maximum contribution is $5000 per project)on approved sites.

Since 1997, over 80 projects have been completed and nearly 2000 acres conserved in Nova Scotia's agricultural landscape. Although this is a province wide program, the majority of the sites are on the rich agricultural lands associated with the watersheds running into the Bay of Fundy.

Achievement_2: Awareness

Achievement 2: The Important Bird Areas (IBA) program is an international effort to identify, conserve, and monitor a network of sites that provide essential habitat for bird populations. The Nova Scotia Eastern Habitat Joint Venture has been working closely with the Cape Sable Important Bird Area committee to protect and conserve the bird species and habitats associated with the Cape Sable Island area. This group, with the support of the schools and municipalgoverments has made great inroads in the local communities towards coastal conservation. The committee has been involved in setting up an information centre for birders, tourists and local community members; working with the Nova Scotia Department of Natural Resources to acquire important coastal habitat; assisting in the protection of the endangered Piping Plover and its habitat; and promoting coastal conservation in the local schools. In 2003, this local IBA committee set up two week long environmental

day camps for local elementary school children to instill the value of coastal habitats and the vulnerablity of these habitats to human disturbance. The camps were so successful that they are to be presented again in 2004.

Achievement_3: Awareness

Achievement 3: Riparian Habitat Evaluation of the Main Stem of the Cornwallis River 2003

Recent studies have indicated that the waters of the Cornwallis River and other waterways in Kings County, Nova Scotia often surpass the Canadian safety guidelines for water quality both in terms on fecal coliforms and nitrates. The agriculture community is highly dependent on these waterways for irrigation water. Potential sources include municipal waste water systems, on site septic and overland runoff from pastures, croplands and manure storage. The loss of wetlands and riparian edges along the waterways appears to be a contributing factor to both the high fecal coliforms and nitrates in the surface water.

In partnership with the Valley Watershed Stewardship Association and the Nova Scotia Department of Natural Resources (NS-EHJV), the Department of Fisheries and Oceans(Stewardship Division) supplied two experienced summer employees to evaluate the health of the riparian edge along the main stem of the Cornwallis River. This had not been previously surveyed. The Municipality of Kings planning office supplied a detailed map of the watershed and other GIS support.

This partnership has provided an opportunity for three levels of government (municipal, provincial, federal) to work together in collaboration with a community group and a university to deliver a practical and beneficial on-the-ground project. The information gathered by the DFO staff can be used to assess the health of the main stem of the Cornwallis River. This will help determine potential sources of contamination and the potential/need to restore the riparian edges. The analysis of the data will also provide an opportunity to fine tune field techniques that can be used on watersheds throughout the province. However, to be effective, the tributaries in the Cornwallis River (or any other watershed) need to be evaluated as well. There are some indications that activities on these tributaries may be a primary source of overland contamination. Through partnerships with all stakeholders, including agricultural producers, the riparian and wetland ecosystems can be evaluated and on-the-ground projects implemented to re-establish the ecological integrity of the watershed.

Current project 1: Kings County Wetland Conservation Initiative

VISION:
An agriculture industry that is dynamic and viable practicing sustainable agro-ecosystem management that conserves and restores species and ecosystem biodiversity at the watershed level.

GOALS:

1. To promote and practice sustainable agro-ecosystem management at the watershed level.

2. The conservation and restoration of wetlands, including riparian edges, and their dependent biodiversity within the agricultural landscape.

SUMMARY:
Kings County is the most intensively farmed and the leading region for agricultural economic activity in the province. Agricultural land use practices within this landscape have been a significant contributing factor to the loss of wetlands and riparian edges; elevated phosphorus, nitrogen and fecal coliform levels in standing and flowing waters; and impacts to wildlife and habitat. Five small watersheds (ranging in size from 8 to 465sq. km) drain this eastern section of the Annapolis Valley before emptying into the Minas Basin- a Ramsar site and a Western Hemisphere Shorebird Reserve.

Although developed by the NS-EHJV, the KCWCI is a partnership of government and non-government agencies and private landowners with a shared vision.

The goals of the KCWCI are to promote and practice sustainable agro-ecosystem management, and the conservation and restoration of wetlands and their dependent biodiversity within the agricultural landscape.

The KCWCI aims to restore and enhance three thousand two hundred and seventy five (3275) acres of wetland, riparian and adjacent habitats through direct and indirect activities including (1) municipal stewardship, (2) riparian fencing, (3) riparian conservation agreements with crop producers, (4) small marsh restoration, (5) irrigation ponds/wildlife habitat, (6) constructed wetlands for milkhouse/manure storage runoff, (7) constructed wetlands for tile drainage, and (8) flushing bars for tractors. These activities will also reduce the potential of surface water contamination from an estimated 115 farms. Linking

with and building upon existing programs and projects, this initiative will have a demonstrable and positive synergistic effect in the application of watershed management principles, BMPs, and habitat conservation techniques.

The relatively small size and location of the watersheds within the agricultural district of Kings county make this both an exciting and feasible project to develop and refine techniques and practices that have potential for application in other agro-ecosystems across Canada. Both government and non government agencies have recognized the value/benefits of this project and several activities have been initiated on a limited basis.

GOM Summit Survey: Submit Completed Survey

Organization: **Ecology Action Centre**

Address: 1568 Argyle Suite, Suite 31

City, State/Province: Nova Scotia

Zip/Postal code: B3J 2B3

Submitted by: Jennifer Graham (jen.graham@ns.sympatico.ca) on Thursday, March 25, 2004 at 08:37:43

Achievement_1: Habitat Maritime activities Awareness Stewardship Other

Achievement_1-Other_category: Identifying tidal restrictions in the Minas Basin

Achievement_1-Description: Between the Summer of 2001 and 2003, the Ecology Action Centre has completed 3 tidal barriers audits on the Nova Scotia side of the Minas Basin. We have prepared a data base of tidal restrictions in Colchester, Cumberland, Hants, and Kings Counties and identified potential restoration sites in each area.

Achievement_2: Habitat Maritime activities Awareness Stewardship

Achievement 2: Cheverie Creek Pilot Restoration Project. As a result of tidal audit work in the Minas Basin, Cheverie Creek, Hants County was identified for a pilot salt marsh restoration project in the Canadian Gulf of Maine. Baseline biophysical data has been collected at the marsh in accordance with monitoring protocols established by GOMC, extensive outreach and educational activities have taken place with local landowners, community groups and schools. We are working in partnership with regulatory agencies including DFO and DOPTW the replacement of a restrictive culvert with a larger opening. The timeframe for culvert replacement is late fall 2004 or early spring 2005.

Current project 1: Pilot Salt marsh restoration at Cheverie Creek, Hants County. Continued outreach, coordination, and data collection to ensure successful culvert restoration and ongoing monitoring at Cheverie Creek.

Current project 2: Tidal Restriction. Extend tidal barriers inventory to cover the entire Nova Scotia portion of the Bay of Fundy, work with St. Marys' University, Environment Canada and CCNB to develop a searchable database of tidal restrictions and restoration opportunities

Current project 3: Nova Scotia Coastal Policy Action. Continue to bring concerned groups together to work towards development of coastal policy for Nova Scotia;

research and raise awareness of impacts of unregulated coastal development, support local groups around coastal issues including bloodworm harvesting, quarries, housing developments, estuarine restoration, and land use planning.

GOM Summit Survey: Submit Completed Survey

Organization: **Fishermen and Scientists Research Society (FSRS)**

Address: PO Box 25125

City, State/Province: Halifax, NS

Zip/Postal code: B3M 4H4

Submitted by ; Patty King (pattyfsrs@auracom.com) on Tuesday, October 19, 2004 at 20:40:05

Achievement_1: Habitat Awareness Stewardship

Achievement_1-Description: Lobster Recruitment Index Project

In the spring of 1999, the Fishermen and Scientists Research Society launched a Short Term Lobster Recruitment Index Project. During the regular commercial season, fishermen use a particular number of scientific lobster traps to gather information about undersize lobsters in their area. More than 160 volunteer fishermen count, sex and record the sizes of lobsters from their science traps and record them in a logbook. These fishermen also indicate if lobsters are berried, tagged, and or v-notched. Each year the standard traps are fished in the same locations to minimize that variable.

This project is designed to study the number and size of juvenile lobsters that will be recruited into the lobster fishery in the upcoming seasons. Collecting juvenile lobster information over a number of years allows an index of recruitment to develop. Over time, trends develop in the data allowing one to predict what the lobster recruitment will be in the upcoming seasons. Lobster fisheries in Atlantic Canada rely heavily on newly recruited lobsters. Hence, we will be able predict, with some degree of uncertainty, if there will be increases or declines for the commercial lobster fishery.

Achievement_2: Habitat Awareness Stewardship

Achievement 2: Joint Fishermen and Scientists Research Society - Maine Lobstermen's Association Collaborative Lobster Recruitment Research Workshop

The Fishermen and Scientists Research Society (FSRS) and the Maine Lobstermenâ s Association held a joint workshop on Collaborative Lobster Recruitment Research on February 19 and 20, 2003 in Halifax, Nova Scotia. The objectives of the workshop were to:

- Review experiences with trap-based short-term recruitment monitoring projects within the Atlantic Canada/Gulf of Maine region.
- Work towards a consensus on the best approaches for this research (including trap configuration and experimental design).
- Secure a future regionally-coordinated development path for these trap-based approaches in which lobster fishermen play a crucial role.
- Promote partnerships between regions of Atlantic Canada, and between Atlantic Canada and the Gulf of Maine region.

Current project 1: Lobster Recruitment Index Project

The Lobster Recruitment Index Project has undergone a five-year review, and it was concluded that the project is providing very valuable information and collaboration and should be continued for the long-term

Current project 2: A joint FSRS – GoM Lobster Foundation Workshop is being planned for February 2004.

GOM Summit Survey: Submit Completed Survey

Organization: **Hants Shore Concerned Citizens Action Group**

Address: PO box49RR#1WaltonHants Co. NS

City, State/Province: Nova Scotia

Zip/Postal code: B0N2R0

Submitted by: Hazel Dill on Monday March 29,2004 at 14:23:55

Achievement_1: Maritime activities

Achievement_1-Description: The Hants Shore Concerned Citizens Action Group has been working to pressure Department of Fisheries and Oceans to limit the commercial marine worm harvesting along the Hants shores of the Minas Basin. Our community based group has succeeded in gaining a representative seat on the Marin worm Advisory Committee. We are concerned about the destruction of the habitat of the mud shrimp which is the main source of feed for the shore birds, we are concerned about the harvesting of the marine worm to the point of extinction and the resulting loss of food for the flounder and bass. We want DFO to do the science necessary to determine the impact the harvest has on the habitat as well as the substainability of the species

Achievement_2: Awareness

Achievement 2: The Hants Shore Concerned Citizen's Action Group has held public meeting in the area and had DFO explain the proposed plan to the community and listen to the concerns of the community members. We have placed articles in the local newspaper and been interviewed by the paper and the local radio station. We have written to all levels of government in an attempt to make our concerns known.

Achievement_3: Stewardship

Achievement 3: The group has attempted to monitor the actions of the commercial harvesters and have notified DFO of any illegal actions.

Current project 1: The group is working to obtain the right to become a Coastal Zone Community Based Monitoring Group - recognized by DFO as having community members willing to take an active role in developing a plan and assisting DFO in doing the science to determine the impact on the species and the habitat.

GOM Summit Survey: Submit Completed Survey

Organization: **North Mountain Old Forest Society**

Address: RR # 5 Canning

City, State/Province: Kings County, Nova Scotia

Zip/Postal code: B0P 1H0

Submitted by: DeLancey J. Bishop (djbishop@glinx.com) on Monday, March 29, 2004 at 06:09:20

Achievement_1: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement_1-Description: In a program funded through Environment Canada's Eco-Action 2000 program, 32 woodlot owners in coastal communities of the North Mountain came together to determine and carry out practical actions for restoring ecological integrity to the forest ecosystems the steward. These actions included restoring natural Acadian forest tree species compositions through selection harvesting and reintroduction, establishment of over 300 nest boxes for more than five species associated with or dependant on large diameter dead trees for cavity nesting, and the exploration of opportunities for guaranteeing protection beyond our ownership through conservation easements.

Achievement_2: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 2: Through a series of education seminars, the members of the NMOFS have come to learn about Forest Stewardship Council (FSC) certification, and the emense role it can play in ensuring that verifiably sustainable forest stewardship is happening for a given property. One woodlot owner has become FSC certified and several others are in the process of certification.

Current project 1: Extending from the experiences with the NMOFS restoration activities is the fact that very little information is conveniently available for directing Acadian forest restoration, and that this was a barrier to successful restoration stewardship. Therefore, the NMOFS applied for funding from the George Cerdic Metcalf Foundation and the Nova Forest Alliance to produce a technical guide on restoring natural Acadian forest ecosystems. The budget for the project is $55,500.00 and the guide is planned to be completed by the end 2005.

Current project 2: Because information on Acadian forest ecosystems is not easily accessible to any given interest, the NMOFS has commenced a project that would create and

maintain an ongoing database of available knowledge on Acadian forest ecosystems. This project has been funded through the Nova Forest Alliance. The database will be first released in 2004.

GOM Summit Survey: Submit Completed Survey

Organization: **The Friends of the Cornwallis River Society**

Address: 87 Cornwallis St

City, State/Province: Kentville, Nova Scotia

Zip/Postal code: B4N 3W3

Submitted by: Derick Fritz (derickfritz@hotmail.com) on Thursday, March 25, 2004 at 18:24:22

Achievement_1: Habitat Maritime activities Awareness Stewardship

Achievement_1-Description: Riparian Fencing and Leasing. Fencing out
Live stalk from the kings county watersheds.

Achievement_2: Habitat Maritime activities Awareness Stewardship

Achievement_2-Other_category: River Guardian

Achievement 2: Getting the community involved in water quality sampling
on the Cornwallis River.

Achievement_3: Habitat Maritime activities Stewardship

Achievement 3: Fish Friends Program

Achievement_4: Habitat Maritime activities Awareness Stewardship

Achievement 4: Watershed Surveys (surveys very from year to year
depending on the research expertise and research need.

Current project 1: Riparian fencing and leasing.

Current project 2: stream surveys

Current project 3: streams enhancement and restoration

GOM Summit Survey: Submit Completed Survey

Organization: **Tusket River Environmental Protection Association**

Address: Box 103

City, State/Province: Tusket, NS

Zip/Postal code: B5A 4A6

Submitted by: Daniel Earle (trepamail@yahoo.ca) on Monday, March 01, 2004 at 07:34:20

Achievement_1: Awareness

Achievement_1-Description: Green Map Project in SW Nova Scotia. We are using Youth Conservation Corps students and volunteers to create Green Maps of our area. These are intended make people aware of important green elements of the natural and cultural environment. We are using a watershed based approach to be able to make connections with the Gulf of Maine context. Phase 1 completed. Maps are in use and on web. In association with Green Map System and Gulf of Maine Institute.

Current project 1: We have adopted and promoted a zero wetlands loss policy in our region. We are promoting development of a Greenway and Trails system for the Broad Brook watershed, the core watershed of the Town of Yarmouth. It is under pressure for filling and stream modifications for development and is being polluted by urban runoff. This is a small but important watershed that feeds directly into the Gulf of Maine.

GOM Summit Survey: Submit Completed Survey

New Brunswick

Organization: **ACAP Saint John**

Address: 76 Germain Street, PO Box 6878 Stn A

City, State/Province: New Brunswick

Zip/Postal code: E2L 4S3

Submitted by: Tim Vickers (acapsj@rogers.com) on Friday, March 26, 2004 at 10:29:00

Achievement_1: Habitat

Achievement_1-Description: ACAP conducts annual stream habitat restoration work in watersheds of the Bay of Fundy. The work aims to reduce the transfer of soils from the riparian zones into the Bay of Fundy.

Achievement_2: Awareness

Achievement 2: We conduct school based education programs on household hazardous materials that, if dumped down the drain, could be deleterious to aquatic life. ACAP reaches some 1500 grade 4 students per year with this program.

Achievement_3: Stewardship

Achievement 3: ACAP's Water Quality Monitoring Program utilizes volunteers from the community to take water samples from some 50 sites in the greater Saint John region. Volunteers learn of the significance of pH, ammonia, phosphates, dissolved oxygen, salinity, nitrates and faecal coliform bacteria.

Achievement_4: Stewardship

Achievement 4: ACAP conducts 2 annual clean ups; a Creek Sweep in the spring and a Beach Sweep in the fall. These initiatives solicit help from over 600 volunteers each year, and remove more than 4 tonnes of debris.

Current project 1: Watershed Morphology and Distribution. ACAP is researching historical changes to the distribution and morphology of watercourses (including streams and marine shorelines)during the course of the industrialization of Saint John, NB.

Current project 2: Marsh Creek Creosote. We are identifying the best means of removing creosote from the sediments of Marsh Creek, a tributary of the Bay of Fundy. Presently, there are some 10,000 cubic metres of creosote contaminated soils in Marsh Creek.

Current project 3: Illegal Dumping. ACAP aims to help curb illegal dumping activities in the greater Saint John region.

Debris often ends up in watercourses or on marine beaches. An awareness campaign and an economic assessment of the problem are still pending.

GOM Summit Survey: Submit Completed Survey

Organization: **Atlantic Salmon Federation**

Address: Box 5200

City, State/Province: St. Andrews, NB

Zip/Postal code: E5B 3S8

submitted by
Muriel Ferguson (asf@nbnet.nb.ca) on Monday, July 12, 2004 at 11:20:24

Achievement_1: Habitat

Achievement_1-Description: Project: Magaguadavic River Recovery Effort

ASF, with other conservationists, government, and the salmon farming industry, is working to maintain the wild genetic stock that will be used in efforts to restore the Magaguadavic River's Atlantic salmon population. In the 1990s, wild salmon returns to the Magaguadavic plummeted to fewer than 20 from an average annual run of 800 in the 1980s. In response, the Magaguadavic River Recovery Group formed and initiated the restoration effort in 1998. Researchers are evaluating the effectiveness of rearing wild Atlantic salmon broodstock to the adult stage in captivity before releasing them to spawn naturally, early versus late season releases, the movement and behavior of salt water versus fresh water reared fish, and lower versus upper river releases. They will use this information to determine how broodstock from wild parents behave when released to spawn in the wild after being reared a complete generation in captivity. This has important implications for the Magaguadavic River and other salmon recovery programs.

Outcome: The research is on-going and the group is optimistic that this project will help the Magaguadavic stocks recover and become a model for reviving other salmon rivers.

Achievement_2: Habitat

Achievement 2: Removal of the Edwards Dam on the Kennebec River

ASF worked, as part of the Kennebec Coalition that was formed in 1989, to remove the Edwards Dam and restore the free flow of the Kennebec River to give sea-run fish access to the riverâ s upper reaches. After a decade of

hard work, this goal was realized on July 1, 1999 when the dam was breached and the river ran free for the first time in 162 years. The Kennebec was the largest river in the U.S. ever to benefit from a dam removal and the Edwards Dam was among the largest removed in the country.

Outcome: Since the damâ s removal, water quality has improved, fisheries are abounding, a new commercial fishery has emerged in an upriver town, and local residents are catching striped bass and shad in habitat that was inaccessible to these species for many decades.

Achievement_3: Habitat

Achievement 3: Tracking Smolt in the Bay of Fundy and Gulf of Maine

The Atlantic Salmon Federation (ASF), Fisheries and Oceans Canada (DFO), and VEMCO Ltd. worked for eight years to develop acoustic transmitters small enough to place in salmon smolts and track them for extended periods as they migrate to sea. This program also involves the National Marine Fisheries Service and the Maine Atlantic Salmon Commission. The goal is to determine the migration patterns of endangered young Atlantic salmon from rivers flowing into the Bay of Fundy and the Gulf of Maine and to determine when, where, and why they are dying. The information will help researchers design recovery strategies to return the populations to health.

Achievement_4: Awareness

Achievement 4: Aquaculture Regulation Progress Report

In 2003, ASF and the World Wildlife Fund (WWF) hired an independent researcher to conduct a review of government actions of the North Atlanticâ s seven largest salmon producing nations to protect their wild Atlantic salmon populations from the impacts of aquaculture. The report, â Protecting Wild Atlantic Salmon from Impacts of Salmon Aquaculture: A Country-by-country Progress Reportâ , showed that all of the countries evaluated, including Canada and the United States, failed to protect wild salmon. This report was particularly disturbing from the Bay of Fundy and Gulf of Maine perspective because of the heavy concentration of salmon farms in these waters. These areas have also suffered devastating declines in their wild populations.

Outcome: The report filled an important need because it coincided with an examination of the North Atlantic Salmon Conservation Organization's aquaculture measures that it was undertaking with no apparent fact-based appraisal of the performance of member nations to date.

Achievement_5: Habitat

Achievement 5: Penobscot River Restoration Project

The Penobscot Partners, of which ASF was an original member, were able to reach a conceptual agreement in 2003 to remove two dams and build a passage around a third dam in an attempt to restore sea-run fish to the Penobscot River, while allowing the power company to maintain more than 90% of its current hydropower generation capacity. The Penobscot River Restoration Project will significantly improve access to more than 500 miles of river habitat, allowing for recovery of 11 native sea-run fish species. It will also strengthen the riverâ s ecological connection to the ocean by providing feed to fisheries and wildlife in the river and the Gulf of Maine. The project has been hailed by the U.S. Secretary of the Department of the Interior as a model for other projects around the country. On June 25, 2004, Gale A. Norton, the Interior Secretary, signed the implementation agreement to purchase the three dams.

The agreement was filed with the Federal Energy Regulatory Commission (FERC), which has principal regulatory oversight responsibilities for hydropower dams. The Penobscot River Restoration Trust must now raise $25 million to purchase the dams and further funds to decommission them.

Outcome: The partners are currently concentrating on building support from the public and government for the work that must be done and the funding to be raised to see the project completed. The Penobscot River Restoration Trust has five years to purchase the dams.

Current project 1: Magaguadavic River Recovery Effort

Current project 2: Tracking Smolt in the Bay of Fundy and Gulf of Maine

Current project 3: Penobscot River Restoration Project

GOM Summit Survey: Submit Completed Survey

Organization: **Atlantic Salmon Federation**

Address: P.O. Box 5200

City, State/Province: St. Andrews, NB

Zip/Postal code: E5B 3S8

Submitted by: Muriel Ferguson (asf@nbnet.nb.ca) on Tuesday, March 30, 2004 at 05:55:50

Achievement_1: Habitat

Achievement_1-Description: Project: Magaguadavic River Recovery Effort

ASF, with other conservationists, government, and the salmon farming industry, is working to maintain the wild genetic stock that will be used in efforts to restore the Magaguadavic River's Atlantic salmon population. In the 1990s, wild salmon returns to the Magaguadavic plummeted to fewer than 20 from an average annual run of 800 in the 1980s. In response, the Magaguadavic River Recovery Group formed and initiated the recovery effort in 1998. Researchers are evaluating the effectiveness of rearing wild Atlantic salmon broodstock to the adult stage in captivity before releasing them to spawn naturally, early versus late season releases, the movement and behavior of salt water versus fresh water reared fish, and lower versus upper river releases. They will use this information to determine how broodstock from wild parents behave when released to spawn in the wild after being reared a complete generation in captivity. This has important implications for the Magaguadavic River and other salmon recovery programs.

Outcome: The research is on-going and the group is optimistic that this project will help the Magaguadavic stocks recover and become a model for reviving other salmon rivers.

Achievement_2: Habitat

Achievement 2: Project: Removal of the Edwards Dam on the Kennebec River

ASF worked, as part of the Kennebec Coalition that was formed in 1989, to remove the Edwards Dam and restore the free flow of the Kennebec River to give sea-run fish access to the river' s upper reaches. After a decade of

hard work, this goal was realized on July 1, 1999 when the dam was breached and the river ran free for the first time in 162 years. The Kennebec was the largest river in the U.S. ever to benefit from a dam removal and the Edwards Dam was among the largest removed in the country.

Outcome: Since the dam' s removal, water quality has improved, fisheries are abounding, a new commercial fishery has emerged in an upriver town, and local residents are catching striped bass and shad in habitat that was inaccessible to these species for many decades.

Achievement_3: Habitat

Achievement 3: Project: Tracking Smolt in the Bay of Fundy and Gulf of Maine

The Atlantic Salmon Federation (ASF), Fisheries and Oceans Canada (DFO), and VEMCO Ltd. worked for eight years to develop acoustic transmitters small enough to place in salmon smolts and track them for extended periods as they migrate to sea. This program also involves the National Marine Fisheries Service and the Maine Atlantic Salmon Commission. The goal is to determine the migration patterns of endangered young Atlantic salmon from rivers flowing into the Bay of Fundy and the Gulf of Maine and to determine when, where, and why they are dying. The information will help us design recovery strategies to return the populations to health.

Outcome: This research is still underway.

Achievement_4: Awareness

Achievement 4: Project: Aquaculture Progress Report

In 2003, ASF and the World Wildlife Fund (WWF) hired an independent researcher to conduct a review of government actions of the North Atlantic' s seven largest salmon producing nations to protect their wild Atlantic salmon populations from the impacts of aquaculture. The report, " Protecting Wild Atlantic Salmon from Impacts of Salmon Aquaculture: A Country-by-country Progress Report" , showed that all of the countries evaluated, including Canada and the United States, failed to protect wild salmon. This report was particularly disturbing from the Bay of Fundy and Gulf of Maine perspective because of the heavy concentration of salmon farms in these waters. These areas have also suffered devastating declines in their wild populations.

Outcome: The report filled an important need because it coincided with an examination of NASCO' s aquaculture

measures that NASCO was undertaking with no apparent fact-based appraisal of the performance of member nations to date.

Achievement_5: Habitat

Achievement 5:

Project: Penobscot River Restoration Project

Working as one of the Penobscot Partners, we were able to reach a conceptual agreement in 2003 to remove three dams in an attempt to restore sea-run fish to the Penobscot River, while allowing the power company to maintain more than 90% of its current hydropower generation capacity. The Penobscot River Restoration Project will significantly improve access to more than 500 miles of river habitat, allowing for recovery of native sea-run fish species. It will also strengthen the river' s ecological connection to the ocean by providing feed to fisheries and wildlife in the river and the Gulf of Maine. The project has been hailed by the U.S. Secretary of the Department of the Interior as a model for other projects around the country.

Outcome: This is an on-going project and the partners are currently concentrating on building support from the public and government for the work that must be done and the funding to be raised to see the project completed.

Current project 1: The three listed in on-going projects were already listed above.

Magaguadavic River Recovery Effort

ASF, with other conservationists, government, and the salmon farming industry, is working to maintain the wild genetic stock that will be used in efforts to restore the Magaguadavic River's Atlantic salmon population. In the 1990s, wild salmon returns to the Magaguadavic plummeted to fewer than 20 from an average annual run of 800 in the 1980s. In response, the Magaguadavic River Recovery Group formed and initiated the recovery effort in 1998. Researchers are evaluating the effectiveness of rearing wild Atlantic salmon broodstock to the adult stage in captivity before releasing them to spawn naturally, early versus late season releases, the movement and behavior of salt water versus fresh water reared fish, and lower versus upper river releases. They will use this information to determine how broodstock from wild parents behave when released to spawn in the wild after being reared a complete generation in captivity. This has important implications for the Magaguadavic River and other salmon recovery programs.

Current project 2: Tracking Smolt in the Bay of Fundy and Gulf of Maine

The Atlantic Salmon Federation (ASF), Fisheries and Oceans Canada (DFO), and VEMCO Ltd. worked for eight years to develop acoustic transmitters small enough to place in salmon smolts and track them for extended periods as they migrate to sea. This program also involves the National Marine Fisheries Service and the Maine Atlantic Salmon Commission. The goal is to determine the migration patterns of endangered young Atlantic salmon from rivers flowing into the Bay of Fundy and the Gulf of Maine and to determine when, where, and why they are dying. The information will help us design recovery strategies to return the populations to health.

Current project 3:

Project: Penobscot River Restoration Project

Working as one of the Penobscot Partners, we were able to reach a conceptual agreement in 2003 to remove three dams in an attempt to restore sea-run fish to the Penobscot River, while allowing the power company to maintain more than 90% of its current hydropower generation capacity. The Penobscot River Restoration Project will significantly improve access to more than 500 miles of river habitat, allowing for recovery of native sea-run fish species. It will also strengthen the riverâ s ecological connection to the ocean by providing feed to fisheries and wildlife in the river and the Gulf of Maine. The project has been hailed by the U.S. Secretary of the Department of the Interior as a model for other projects around the country.

GOM Summit Survey: Submit Completed Survey

Organization: **Bay of Fundy Ecosystem Partnership: Salt Marsh and Restricted Tidal Systems Working Group**

Address: c/o Jeff Ollerhead, Mount Allison Coastal Wetlands Institute, 144 Main Street

City, State/Province: Sackville, New Brunswick

Zip/Postal code: E4L 1A7

Submitted by: Jeff Ollerhead & Janice Harvey (jollerhead@mta.ca & ccnbharvey@nb.aibn.com) on Wednesday, June 09, 2004 at 10:01:14

Achievement_1: Other

Achievement_1-Other_category: Increasing networking between stakeholders

Achievement_1-Description: The goals of the Salt Marsh and Restricted Tidal Systems (SMaRTS) Working Group are to:

1. Support and facilitate collaboration, networking and information exchange with respect to:
   A. the distribution, nature and impacts of tidal restrictions, and
   B. the distribution, extent, and ecological status of salt marshes in the Bay of Fundy.

2 Identify, promote and facilitate new research and conservation projects around the Bay of Fundy pertaining to:
   A. the impacts of tidal restrictions on coastal habitats and the potential implications of their removal or modification;
   B. the state of salt marshes, and their enhancement and restoration.

3. Promote and facilitate co-operative research, conservation and educational projects which involve citizens in identifying salt marsh and tidal barriers issues and implementing solutions, including socio-economic considerations and economic valuation.

Current project 1: We organize 2-3 meetings per year for our members in order to facilitate networking and communication.

GOM Summit Survey: Submit Completed Survey

Organization: **Centre for Community-Based Resource Management, Bay of Fundy Program**

Address: PO Box 3920

City, State/Province: St. Andrews, NB

Zip/Postal code: E5B 3S7

Submitted by: Maria Recchia (mariar@nb.sympatico.ca) on Wednesday, March 17, 2004 at 13:32:51

Achievement_1: Maritime activities

Achievement_1-Description: Our report _Local Knowledge and Local Stocks:An atlas of groundfish spawning in the Bay of Fundy_ was the result of a 3 year research project that documented fishermen's knowledge of groundfish spawning areas. The report helped to legitimize the use of local knowledge research in the fisheries management arena. The loss of inshore spawning grounds and the vulnerability of those that remain reveal important lessons for fisheries management.

Achievement_2: Awareness

Achievement 2: Through the Coady International Institute we offer a certificate course in Community-Based Resource Management. The course covers many aspects of CBRM including community organizing, participatory research, governance, law and policy and others. Fisheries, agriculture, forestry and other sectors are included. The course runs in the fall of each year. Information can be obtained from www.stfx.ca/institutes/coady/

Achievement_3: Maritime activities Awareness

Achievement 3: We work to link people and organizations engaged in coastal issues: protection of livlihoods, marine and coastal conservation, and sustainably resource use. Our connections are global allowing us to bring people together to talk from Asia, Africa, Across North America and Central America.

Achievement_4: Maritime activities Awareness Stewardship

Achievement 4: We work to support community groups through capacity building and organizational development. By strengthening our local groups we are increasing their ability to participate in marine stewardship, community-based resource management, and planning.

Current project 1: Establishment of a coastal resource centre in Charlotte County New Brunswick.

Current project 2: Eco-marketing of local sustainably caught seafood.

Current project 3: Capacity Building work with local fishermen's organizations.

GOM Summit Survey: Submit Completed Survey

Organization: **Conservation Council of NB**

Address: 180 St. John Street

City, State/Province: Fredericton, NB

Zip/Postal code: E3B 4A9

Submitted by: Janice Harvey (ccnbharvey@nb.aibn.com) on Friday, May 21, 2004 at 13:12:28

Achievement_1: Habitat

Achievement_1-Description: The Conservation Council nominated the Musquash Estuary as a marine protected area (MPA) in 1998 and has led a campaign to have it declared under Canada's Oceans Act. In 2000, DFO accepted Musquash as an Area of Interest, the first step in the MPA process. Since then draft regulations have been developed and a federal-provincial MOU is being negotiated. We formed Friends of Musquash, a community-based group to monitor the progress of the MPA and to be a liaison between DFO and the community. We also convinced the Nature Conservancy of Canada to adopt Musquash as a priority area for land acquisition, so the upland area not included in the MPA would also be protected. While it has taken far too long, we anticipate the formal declaration of the Musquash MPA shortly.

Achievement_2: Contaminants

Achievement 2: The Conservation Council has developed a simple nitrogen export model which can be used by watershed groups, planning commissions and communities to calculate nitrogen loading to individual watersheds or waterbodies from several sources: sewage, waste water treatment plants, fish plants, salmon aquaculture, agriculture, and atmospheric deposition. Rather than absolute loadings, the value of the model is to estimate relative loadings, which can then help to identify watershed-specific priorities for reducing nitrogen loads to coastal waters. This model is based on similar work by Dr. Peter Strain, DFO, in the L'Etang Estuary.

Achievement_3: Awareness

Achievement 3: In 2002, the Conservation Council released a scientific report called, "Two Hundred Years of Ecosystem and Food Web Changes in the Quoddy Region, Outer Bay of Fundy." Researched and authored by Heike Lotze and Inka Milewski, the report exhaustively references scientific and other information to document declines in ecosytem integrity over 200 years of human development. While

similar studies have been done elsewhere, it is the first in the Gulf of Maine to compile archeological, historic and current data to descibe long term trends in ecosystem health. We also published The Quoddy Report, a tabloid version for popular distribution, which highlights the main ecological features of the Quoddy Region, and the primary conclusions of the scientific report. This was distributed as a newspaper insert and as class sets to Fundy schools.

Achievement_4: Awareness

Achievement 4: The Conservation Council conducted habitat surveys of all major estuaries in the Canadian Gulf of Maine and published a seminal report called "Habitat Lost: Taking the Pulse of Estuaries in the Canadian Gulf of Maine." This has become a standard popular reference for people interested in learning about environmental conditions in the Bay of Fundy. It highlighted tidal barriers and aquaculture as particular habitat threats, and identified the Musquash estuary as one that should be protected.

Achievement_5: Habitat Awareness

Achievement 5: As the first phase of our Return the Tides Campaign, Conservation Council researchers conducted an audit of tidal barriers along the entire New Brunswick Fundy coast. The information gleaned from this project will identify potential restoration sites and encourate local organizations to "adopt a tidal barrier" for removal or remediation.

Current project 1: The Fundy Baykeeper works for the Conservation Council to defend the public's right to a healthy Bay of Fundy. Part investigator, scientist, lawyer, advocate and educator, the Fundy Baykeeper's top priority is to make sure environmental laws are enforced as citizens expect them to be. The Fundy Baykeeper uses a well-marked boat to patrol the Fundy coastline from above Saint John to St. Stephen. The goal is to spot and investigate environmental threats and take action to solve them. The Baykeeper also educates citizens about the Bay of Fundy and encourages them to become Bay of Fundy Stewards -- eyes and ears on the Fundy coast.

GOM Summit Survey: Submit Completed Survey

Organization: **Eastern Charlotte Waterways Inc.**

Address: 102 Main Street

City, State/Province: St. George, New Brunswick

Zip/Postal code: E5H 2M1

Submitted by: Susan Farquharson (ecwinc@nbnet.nb.ca) on Monday, March 29, 2004 at 14:08:41

Achievement_1: Habitat Contaminants Maritime activities Stewardship

Achievement_1-Description: Cooperative Bacterial Monitoring Program (CBMP)developed to oversee the assessment and monitoring of 1300km of coastline in southern NB and assist with the overall management of the soft-shell clam resource. To date more than 1500 acres of clam harvest areas have been reopened witnessing environmental and economic benefits; sites are monitored on an annual basis allowing for better assessment and remediation activities directed at reducing bacterial contaminants in coastal waters.

Achievement_2: Habitat Awareness Stewardship

Achievement 2: Lepreau Salt Marsh Restoration Project redirected a freshwater system back to its natural course into the upper reaches of a dieing saltmarsh. Community participated in a one day cleanup of the marsh system before the water was redirect. Tonnes of garbage including appliances and furniture were cleaned from the marsh and stream area. Salinity levels throughout the marsh area have returned to a sustainable level and wildlife can be witnessed in the area. A large sign has been erected on the site to remind community to take care of the marsh. Annual monitoring is conducted to ensure the redirection and the marsh area are maintained.

Achievement_3: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 3: Adopt-a-Shoreline Program was initiated in 1999 to address the ongoing situation of industry based marine debris. After conducting many Beach Sweeps as a one day annual event, ECW made the decision to address the debris at the source by asking the aquaculture industry to adopt shorelines adjacent to their operations and maintain the sites on an annual basis rather than a one day cleanup. To date more than 30 beaches have been adopted. In 2003 a video audit was conducted of the sites. A CD of the results will be available in 2004.

Achievement_4: Habitat Maritime activities Awareness

Achievement 4: Research and Development Lease in Lepreau Harbour: Approved in 2003 under the Southwestern NB Clam Resource Committee chaired by ECW. The multi-sectoral team representing government, industry, science and industry were a rewarded an occupational permit until 2006 for 70 hectares to develop enhancment techniques for ensuring the sustainability of the softshell clam considering the externalities the declining resource has been facing including invasive species and overharvesting. Methodologies, including quick assessment techniques and cost effective growth strategies may be applied to other coastal areas in the future witnessing declining clam stocks.

Achievement_5: Habitat Maritime activities Awareness

Achievement 5: Phase I Community Based Assessment of Rockweed Harvest in Southern NB: ECW conducted a third party audit of the Rockweed Harvest in southern NB in 1999 - 2000. The study was a result of the communities demand for information regarding the possible impacts the rockweed harvest may be having on marine ecosystems so dependant on rockweeds for nurseries, habitat, shelter. Access and information to the harvest management plan and the harvestable sites was provided by Acadian Seaplants Ltd. Results were made available to community providing them with information regarding the overall harvest technique and the final study findings and recommendations.

Current project 1: Rockweed Assessment Phase II: ECW will be conducting a 5 year Phase II Rockweed harvest assessment in 2004-2005 which was one of the recommendations in the Phase I. Once again industry will be supplying harvest details and cooperating with the study.

Current project 2: Traditional Ecological Knowledge (TEK) in GIS: Marine data which is traditional information gathered from fishers, tourism and organizations has been compiled and maintained on site since 1998. The data important to integrated marine management will be updated this year through a series of interviews and openhouses.Information will be housed in a GIS format and shared with science, academia and fish management agencies to make well informed decisions regarding coastal management.

GOM Summit Survey: Submit Completed Survey

Organization: **Falls Brook Centre**

Address ;125 South Knowlesville Road

City State Province: Knowlesville, New Brunswick

Zip/Postal code

Submitted by: Jeanne Arnold (ja@fallsbrookcentre.ca)

Achievement_1: Habitat
Achievement_1-Description: Falls Brook Centre staff and interns have been involved over the past five years in clean up programs for Bocabec Bay, garbage removal, citizen awareness activities, erosion control, restoration, and protection. FBC has conducted nature walks for visitors to the area, promoted sustainable tourism, and organic agriculture.

Current project 1: Bocabec Bay protection clean-up and appreciation

Current project 2:

Current project 3;

GOM Summit Survey Submit Completed Survey

Organization: **Hammond River Angling Association**

Address: 10 porter road

City, State/Province: Nauwigewaul New Brunswick

Zip/Postal code: e5n 6x1

Submitted by: Sandy Mackay (hraa@nbnet.nb.ca) on Monday, March 01, 2004 at 08:10:16

Achievement_1: Habitat Awareness Stewardship

Achievement_1-Description: HRAA runs youth education programs reaching about 3,000 students/year. Other programs include riparian zone planting, Nursery Management, community outreach and public awareness workshops. We run a salmon restoration program as well, researching and re-stocking salmon into the Hammond, about 6-12,000 indigenous smolt and parr/year.

Current project 1: Youth Programs- Kids R Cool 4 Conservation Youth summer day camp, involves sports- kayaking, swimming and fishing presented in an Environmental framework

Current project 2: Riparian Planting initiatives- tree planting, fencing cattle pasture and community out reach to convince local farmers to commit to standards 5m setbacks in hayfileds.

Current project 3: Community Outreach- Involving community members to participate in Watershed planning.

GOM Summit Survey: Submit Completed Survey

Organization: **J.D. Irving, Limited**

Address: 300 Union St

City, State/Province: Saint John, New Brunswick, Canada

Zip/Postal code: E2L 4M3

Submitted by: Mary Keith (keith.mary@jdirving.com) on Thursday, September 30, 2004 at 06:34:56
Achievement_1: Habitat Contaminants Maritime activities Awareness
Stewardship Other

Achievement_1-Other_category: Education of youth on Atlantic wild salmon and protection required

Achievement_1-Description: Wild Atlantic Salmon: Research, Conservation, Protection & Education for Youth

1. Background

In 1980 J. D. Irving, Limited, a forest products company, initiated a fisheries management program to monitor and conserve the fish inhabiting its woodlands waterways. In the past 24 years the program has grown as a partnership with the Atlantic Salmon Federation (ASF). The company assists in its research under international wild salmon stock expert, Dr. Fred Whoriskey.

J.D. Irving, Limited now employs 3 full time wildlife biologists and a summer staff (8) to assist in fish research on its woodlands waterways. Staff install and operate counting fences on the salmon streams, monitor the spawning salmon's movement upstream with passive injectable transponders (PIT), and count the fry as they are developing. Data is given to ASF for Dr. Whoriskeyâ s research.

Assessing Habitat

River by river, stream by stream, the Irving fisheries staff must keep a detailed record of the fish habitat in Irving woodlands. Staff make these observations by walking through the water, or gliding over the habitat in a canoe. All streams and rivers within Irving woodlands (Nova Scotia, New Brunswick, Maine) are assessed for details on depth, width, vegetation, bottom surface, and speed of the water's movement. Lakes within Irving forests are similarly surveyed to learn what species make up their fish populations, and to estimate the numbers of fish.

Helping salmonid stock through their most

"at risk" life period

Every year, about 75,000 Atlantic salmon and brook trout fry are raised for six months in tanks by Irving forestry staff at their Black Brook Woodlands facility and at Juniper Nursery. This intervention saves the newly hatched eggs from predators and other hazards in their natural environment. In the fall, when the salmon and trout fry have grown into fingerlings, they are released back into the rivers where they were spawned. This brief intervention by the forestry staff helps the existing, dwindling, trout and salmon populations increase.

Water Temperature Monitoring

Instruments designed to automatically record water temperatures monitor the rivers and streams flowing through Irving woodlands. This information is valuable to fisheries biologists as they assess the suitability of the water for trout or salmon, because these fish are very temperature sensitive. By knowing the water's summer maximum and spring minimum temperatures, the Irving biologists learn which streams are able to provide good habitat for the salmonids in the summer and nurture the juveniles in the spring.

Stream Restoration/Habitat Enhancement

Evaluating all the data they have collected the Irving biologists identify which streams need work to make them better habitat for fish and other wildlife. Sometimes forest workers must clear the stream bed of debris, or stabilize the stream banks to keep the earth and rock from sliding into the waterway. Other work involves placing small barriers called riffles across part of the waterway to slow the water's speed. Fast moving water can be so strong a force that fish are unable to swim against it as they go upstream to spawn. Fast-moving water will undercut a stream's banks and allow more earth to slide into the stream bed, so fish cannot swim through the shallow water.

Bottomless Culverts

Upstream migration has always been a challenge for Atlantic salmon and brook trout. In Irving Woodlands we are committed to installing only bottomless culverts on fish-bearing streams to conserve fish habitat. Our huge half culverts straddle a

watercourse with an edge positioned well back on the shoreline on each side of the stream. The natural watercourse is unaffected by the culvert. Round culverts increase high water velocities that challenge spawning fish. Instead of rocky bottoms that encourage spawning, the round culvert bottom is smooth steel. Bottomless culverts, unlike other types, keep stream gravel dynamics intact. They protect fish habitat and help maintain healthy fish populations.

Geographic Information Systems (GIS)

Aquatic information and stream survey data collected by Irving fisheries biologists is placed in the company's GIS system. This computer-generated mapping system compiles the information used by Irving foresters to plan their forestry activity and protect critical fish habitat like salmon spawning beds and holding pools. The GIS system has access to a global positioning unit linked to a depth sounder. It can provide accurate three dimensional lake profiles as part of the GIS database.

Education

Education is an important part of the fisheries research and management carried out by Irving staff. Every year school students with their teachers help the Irving foresters and biologists with the Company's salmon stocking program. At the same time they learn more about the wild Atlantic salmon that are now on the Endangered List for the Bay of Fundy.

2. Website Game on Protecting the Atlantic Salmon.

Actively involving young people of the Gulf of Maine region is the best way to ensure the long-term conservation of Atlantic salmon stock that are now on the Endangered List in the Bay of Fundy.

The Salmon Game, a feature on J.D. Irving, Limited's educational website, the Irving Forest Discovery Network (the www.ifdn.com), challenges students to swim a salmon up a river past many difficulties to the salmon's spawning place. As they race against a clock to win the students must correctly answer detailed knowledge questions on the Atlantic salmon's life cycle. The game has been hugely popular with students

(grades 5 - 9). The site draws on average some 22,000 visitors monthly.

The feature includes a teacher's section with in-class activities and lesson plans regarding salmon habitat and conservation practices. A research section details the company's initiatives to understand and protect Atlantic salmon. The site offers students a text and cartoon section on the life cycle of the fish.

The Atlantic salmon feature has been designed, developed and produced in partnership with the New Brunswick Department of Education, the Atlantic Salmon Federation and J.D. Irving, Limited.

Achievement_2: Habitat Contaminants Awareness

Achievement 2:

Unique Areas

In woodland operations at J.D. Irving, Limited, forests are more than a wood supply. Carefully planned forest management identifies areas that are unique for their ecological value. Over the past 7 years, projects have been undertaken to catalogue unique sites within New Brunswick, Nova Scotia and Maine. Some sites are as small as 0.5 hectares (1.2 acres), while others exceed thousands of hectares. Irving employees look for unique areas while doing operational field work.

Irving foresters have recognized and are protecting more than 320 unique areas found on woodlands the company owns or manages. Many of these sites are on lands adjacent to the Bay of Fundy in Nova Scotia, New Brunswick and Maine. The company encourages the public to make the company aware of potential unique sites where plants or wildlife rare in that area are located. This dynamic program is continually growing.

From Nova Scotia to Maine, the average size of a Unique Area is approximately 184 hectares (454 acres). Information gathered on each site is used to better manage the company's lands and protect the elements that give these sites their significance.

J.D. Irving, Limited has been nationally recognized for its commitment to preserving areas of cultural and ecological significance. The company's Unique Areas program is a winner of the national Canadian Council on Ecological Areas (CCEA) award, "... for leadership in promoting sustainable ecosystem management and its role in designating land and resources for conservation."

In June 2004 J.D. Irving, Limited donated more than 400

acres (163 hectares) of ecologically important Bay of Fundy coastline to the Nature Conservancy of Canada (NCC).This land in the Musquash estuary is now secured as a nature preserve in perpetuity.

The Musquash Estuary has extraordinary ecological significance. In an assessment of all major estuaries in the Bay of Fundy, Musquash was found to be the only one undamaged by human activities, and the last one with all of its ecological functions intact. This estuary contains all the habitat types found in the greater Bay of Fundy region including cobble and sand beaches, mudflats, salt marshes, rocky headlands, coastal forests and islands.
The property is home to moose, coyote, snowshoe hare, bobcat, grouse, several types of woodpeckers and other birds. It is particularly important for waterfowl, with over 30 species observed within the estuary each year, many of which nest there.

Achievement_3: Habitat Contaminants Maritime activities

Achievement 3: Pollution Prevention by Reverse Osmosis

Between 1995 and 2000 Irving Pulp and Paper (IPP) pioneered new pollution prevention technology using reverse osmosis that made the mill a North American leader in reducing water discharges. Formerly effluent from the mill's processes was released into the St. John River where it meets the Bay of Fundy. This effluent had the potential to cause endocrine disruption in fish.

Significant manpower and financial investments by the J.D. Irving, Limited mill achieved this world-first application of pollution prevention technology. The mill's use of reverse osmosis had an important impact on the river's water quality and on fish health. Independent scientific studies by Dr. Deborah McLatchey, a biologist at the University of New Brunswick in Saint John, documented the benefits for aquatic ecosystems and fish health. Her research showed reverse osmosis at IPP significantly lowered pollution levels in the mill, and removed compounds responsible for endocrine disruption in fish.

Endocrine disruption is a global environmental issue affecting normal hormonal processes in humans and wildlife. Potential effects include mild to severe reproductive problems. The reverse osmosis system eliminates Irving Pulp & Paper's potential for endocrine disruption in fish at Reversing Falls.

In April 2003, Irving Pulp and Paper was recognized by the North American Commission for Environmental Cooperation (CEC) - the NAFTA environmental watch-dog group - for achieving the second highest decrease in

surface water discharges in North America. During the 5 year review period (1995-2000), Irving Pulp & Paper reduced water discharges by 2,768,706 kilograms.

Reverse osmosis, the same system used by municipalities and homeowners to purify drinking water, has been applied on a massive scale at Irving Pulp and Paper. In a traditional home filtering unit, the system may consist of one or two membranes. At Irving Pulp & Paper, 420 membranes on 5 x 10 spools remove 10 - 15 gallons of concentrated filtrate each minute. The filtered water is recycled in the mill to be reused in the pulping process. In 1988 with no recycling of mill water 30,000 gallons of water were required to produce each ton of pulp. Today, Irving Pulp and Paper is recycling over 2,000 gallons of water per minute. The mill' s water consumption has been reduced by over 40%.

Achievement_4: Habitat Contaminants Maritime activities Awareness Stewardship Other

Achievement_4-Other_category: Education of youth on Fundy ecosystems

Achievement 4: Irving Nature Park - Nature Education in Saint John, NB

Irving Nature Park (INP) is a 600 acres (243 hectare) site created by J.D. Irving, Limited to help protect an environmentally significant, endangered area. This special peninsula jutting into the Bay of Fundy is now a place where the public can experience and learn about the region' s ecosystems only minutes from the city' s centre.

The park is open to the public, free, from 8 am to sundown from May to November. In the winter the park' s perimeter road is closed to vehicle traffic but people are encouraged to use the site for snowshowing, cross country skiing and hiking. Park staff, programs and all maintenance work are provided free of charge by J.D. Irving, Limited. Education and conservation have been INPâ s focus since the park was opened in 1992.

Site Development
Road and trail systems were designed to take visitors to four distinct regions in the Bay of Fundy park:
1. Barrier beach and the sand spit at the delta of the St. John River and the Bay of Fundy
2. Geological rock formations from glacial deposits / sea cliffs of the area
3. Acadian Forest shown by the stands of spruce and fir natural to the Fundy coastline
4. Saltwater marsh and the mudflats - sanctuary for waterfowl and migratory birds

Permanent Signage
Signage developed and installed in the park before its opening explained the four ecosystems and wildlife

/plants relating to them at appropriate points. As new eco-system sites have been developed additional signage has been added.

Printed Materials
1. The original INP brochure describes the four eco-systems found within the park:
and encourages visitors to learn more about them during their visit. Successive brochures over the ten years give revised maps with more educational enhancements such as the boardwalk out on the saltmarsh, or the viewing tower to understand the entire site' s relationship to the Bay of Fundy, or the additional trails to take visitors to additional learning experiences like the Frog Trail that explores a bog. The focus of each brochure remains the same - learning about nature at Irving Nature Park.

2. Naturalist Notebook sheets are produced quarterly on the wildlife and other natural features found in the park. The first of these 3-ring binder, heavy stock sheets was handed out at the opening ceremony, and additional ones have been produced over the past 12 years. Like the brochure, the newest sheet is handed out to every visitor as it becomes available. These sheets are now part of a binder notebook that many regular visitors strive to keep current. These scientific explanation sheets about the various park ecosystems are now also available on the Irving Forest Discovery Network (www.ifdn.com)
3. Pocket Cards as Check Lists have been produced for observations by regular park visitors. (One for plants, one for birds) These were developed a few years after the opening in response to the requests from visitors anxious to catalogue their experiences of plants and birds at the park.

Park Staff
Under the guidance of the park manager, park naturalists staff the information booth during all operating hours to answer questions and provide pamphlets describing the site' s ecosystems. Staff continually walk the trails, greeting visitors and explaining something about the ecosystem that the visitors were experiencing. They act as "nature guides" for groups pre-booking a tour or for scheduled and advertised public tours with an educational purpose eg. wildlife at the tidal line Over the 12 years the staff have also kept scientific documentation with photography, research and written text on the park' s ecosystems.

Educational Programs
1. Special Event tours for groups of scouts, guides, brownies, cubs, church groups, school classes, began in 1992 with some 40 - 60 tours during the fall. Since then special tours by park naturalists have increased

amazingly. Park staff provide education programs on site for some 3700 students per year. Attendance at the park has averaged about 6800-7000 people annually for the past 6 years.

2. Involving Educators - INP staff meet with the regional School Districts' biology and science teachers to learn how INP can be incorporated into school curricula experiences. Now INP is booked from the second week in September to the end of October every weekday morning for one or two tours for students from K - 12. and again in May - June. The park's s naturalists give hands-on experience of curricula to meet the classes program needs. University classes come for tours with their professors as well.

3. New Brunswick Museum - INP staff established a relationship with the museum's Environmental Education Coordinator so that field work from their programs would be done at INP. Cooperation on information and assistance with wildlife and plants has continued ever since. eg. saving seal pups, rescuing birds, etc.

4. University of New Brunswick in Saint John established a relationship to use the park for its Marine Biology students' work in 1992. Twelve years later INP is using the labs at UNBSJ to do its own research on mud shrimp and other projects.

5. Noted local educators in geology and botany now assist with special event educational tours for the public. The park manager has worked at establishing these mutually beneficial relationships since the park's opening.

6. NB Astronomy Association with its chapters in Saint John and Hampton give regular public talks on astronomy during special evening events at the park.

7. New Brunswick Federation of Naturalists (club chapters in Saint John, Moncton and Fredericton) use the park for field tours on various topics.

8. Atlantic Coastal Action Program (ACAP) works with INP staff for its monitoring of the environment. The federal Minister of the Environment visited the parkâ s marsh site in 1997 with her ACAP hosts to see the partnership's work.

9. Greenwing Program with Ducks Unlimited brings 1300 students to the park each spring to learn about the importance of wetlands, marsh creatures and bird identification. Since 1997 INP naturalists have assisted the DU staff in delivering this educational program.

10. Canadian Wildlife Service relies on INP naturalists

for various monitoring and surveys of waterfowl and salt marsh birds in the area.

11. Adventure Day Camps for youth begun in 1996 with two summer events (3 days) where children learn through nature awareness activities, bird calling, animal tracking, rock shore exploration, etc. offered by the park's naturalists. The program has grown since then to 5 day camps offered every summer and designed to suit the attention and interests of specific ages from 4 to 12. There is no cost for the children to attend. A waiting list follows the initial registration as more children are eager to attend that there are spaces available.

12. Earthworks Program of the federal government provided funding in 1999 to hire 4 additional park staff that year to set up several research and monitoring projects. Their work has centered on a waterfowl inventory and barrier beach restoration by replanting marram grass and other stabilizing plants. Visitors to INP have participated with park staff in restoring the environment and recording bird sightings.

13. Extended Learning from INP. During the winter months INP naturalists accept invitations to visit schools and talk about the different ecosystems in the Bay of Fundy environment. (The Irving Forest Discovery Box makes a great hands-on tool to take into a classroom.) The park staff have also become the experts consulted by students and teachers through the educational web site (www.ifdn.com). As well, a tour of the INP's ecosystems is possible virtually at the ifdn web site. Students learn from the park using their home computers or their school's computers.

The Viewing Tower and the Marsh Boardwalk have become essential educational sites for tours. Students of all ages are thrilled learning about the diversity of marsh life while "critter scooping" from the boardwalk. Their experiences of these ecosystems have led to other experiences, like the high school environmental science class that installed waterfowl bird houses, and osprey nesting towers beside the marsh. Students learn not to step off the path on the way to the tower because they may damage rare fungi on the forest floor. From the tower viewing deck they are at the nesting level with songbirds, and can observe through the permanent binoculars eagles or turkey vultures or osprey over the marsh diving from great heights for their prey.

Special walks like the Frog/Bog trail, the Chickadee trail (it follows a moraine) and the challenging Sheldon Point trail (a 4 km walk past geological formations and fossil beds along a rugged shoreline) provide new

experiences of nature. Descriptive signage and the INP brochure map give ecosystem information for the hikers..

Tree planting has taken place outside the park in a gravel pit reclamation site adjacent to INP. Undertaken by J.D. Irving, Limited the area was grassed and then children's groups like the scouts and brownies, and school classes were invited as part of their INP experience to plant trees there to make it a children's forest. For the past five years school children have planted trees in the Children's Forest on Arbor Day, and are very proud of what they are creating.

Over 10,000 trees have been planted, guided by the Irving foresters and INP naturalists. When the tree growth is well established this new forest area will provide additional learning experiences for visitors.

Media Response to Irving Nature Park
Since 1992 the media (print, radio, television) have been fascinated with the park. Staff have always focused their interviews on what can be learned about nature in the park environment. Staff have consistently increased their own documenting of wildlife in the park and combined their observations with research. Park staff are now recognized as experts on various aspects of the environment and are frequently called by the media to share their knowledge.

Beginning in 1994 the park staff have given media tours to emphasize the parkâ s educational role. Some years over 100 journalists have visited and gone home to write or talk about the educational value of this beautiful site. The message has travelled widely as well as locally. Tourists who arrive from outside North America are thrilled by the nature experiences offered in INP.

Achievement_5: Habitat Contaminants Maritime activities

Achievement 5: Research Programs of J.D. Irving, Limited

o An Irving Scientific Advisory Committee of well-known, independent scientists recommends and directs our research projects.

o Partnerships with organizations like the World Wildlife Fund, and the Sustainable Forest Management Network have increased our ability to share information and conduct research.

o All streams, rivers and lakes within Irving woodlands (Nova Scotia, New Brunswick, Maine) are assessed for details on depth, width, vegetation, bottom surface, and speed of the water's movement. They are surveyed to learn what species make up their fish populations, and to estimate the numbers of fish.

o Some of the current research projects, in partnership with various universities, monitor songbird populations in our New Brunswick woodlands, Canada lynx in the north Maine woods, sustainable development of vascular plants and bryophytes within refuge islands in our clearcuts.

o Water temperatures are automatically monitored by instrumentation in the rivers and streams flowing through Irving woodlands. Irving fisheries biologists assess the suitability of the water for temperature-sensitive fish.

o Irving Woodlands has pioneered the installation of "small scale bottomless culverts" on fish-bearing streams in its forests to conserve fish habitat. Huge round culverts have been sliced in half length-way so that a half culvert can be positioned by an excavator completely spanning the watercourse. The edges are positioned well back from the banks on each side of the stream, leaving the natural watercourse unaffected by the culvert. What began as an experiment in Irving Woodlands 7 years ago is now standard practice for building stream crossings on all fish-bearing watercourses. It has been learned that improperly installed round culverts at too steep an angle (more than a 0.5% slope) increase water velocities that challenge upstream passage for spawning fish. Bottomless culverts that retain the natural stream bottom help preserve valuable fish habitat.

GOM Summit Survey: Submit Completed Survey

Organization: **Nature Conservancy of Canada**

Address: 924 Prospect St., Suite 2

City, State/Province: Fredericton, NB

Zip/Postal code: E3B 2T9

Submitted by: Darla Saunders (darla.saunders@natureconservancy.ca) on Friday, July 23, 2004 at 07:28:27

Achievement_1: Habitat Awareness Stewardship

Achievement_1-Description: The goal of the Nature Conservancy of Canadaâ s Musquash Estuary Project is ensure that the ecological integrity and biodiversity of this natural area is maintained forever. The project incorporates landowner contact, property donations and acquisitions, development and implementation of a stewardship plan, and recruitment of local volunteer stewards. Establishment of a local stewardship committee and volunteer network has helped to increase community awareness and to facilitate local involvement in site management and monitoring. The recent donation of a 403 acre property by J. D. Irving, Limited brings the Nature Conservancy of Canadaâ s Musquash Estuary Nature Preserve up to 1,207 acres. This project has received generous support from a number of sources including the Gulf of Maine Council on the Marine Environment, the National Oceanic and Atmospheric Administration, and Environment Canada.

Achievement_2: Habitat Awareness Stewardship

Achievement 2: The Nature Conservancy of Canada is working to protect Pendleton Island with the help of generous donations by members of the Ward Pendleton family and Dr. Herb Mitton. This magnificent island consists of gently undulating terrain with rocky outcrops. Part of the Deer Island archipelago, Pendleton Island has a bay with a steep, gravel barrier beach, a small lagoon, and beautiful coastal forests. The island provides habitat for numerous native terrestrial mammals and bird species. The Nature Conservancy of Canada is dedicated to the preservation of the extraordinary site in its natural state for the benefit of future generations.

Current project 1: The Nature Conservancy of Canada is working to secure a total of 3,000 acres in the Musquash Estuary by 2007.

GOM Summit Survey: Submit Completed Survey

Organization: **Nature Trust of New Brunswick**

Address: P.O. Box 603 Station A

City, State/Province: Fredericton, New Brunswick

Zip/Postal code: E3B 5A6

Submitted by: Margo Sheppard (ntnb@nbnet.nb.ca) on Sunday, February 29, 2004 at 14:12:53

Achievement_1: Habitat Awareness Stewardship

Achievement_1-Description: Since 2000, the Nature Trust has had an ongoing program of coastal land stewardship and landowner contact. Several hundred landowner of important coastal areas, principally in Charlotte County, have been contacted by letter and in person, informed of the ecological sensitivity of their lands and their local/regional significance, and encouraged to conserve their land through a variety of mechanisms. We have maintained on-going contact with numerous landowners and negotiated several conservation projects (see below).

Achievement_2: Stewardship

Achievement 2: For two summers we have held two-day clean-ups on hard-to-reach islands in the vicinity of Deer Island. Last summer 3.65 tonnes of garbage was hauled off two islands; a comparable amount was taken off the previous year. We will continue this effort in coming years as part of our island stewardship program.

Achievement_3: Habitat

Achievement 3: In the past 13 years, the Nature Trust of NB has established eleven nature preserves on mainland and islands in the Bay of Fundy. We own fourteen entire islands in the Bay. In total, an estimated 750 acres have been set aside for nature, bird nesting and staging areas, passive recreation and enjoyment through these efforts. Securement techniques have included donation and conservation easements.

Achievement_4: Awareness

Achievement 4: The Nature Trust has distributed flyers to adjacent owners of nature preserves owned by the Trust to educate them of the environmental sensitivities of the land and to encourage observation of these. Also, we have posted no-hunting signs and no-ATV signs at several preserves in accordance with management plans developed for the lands.

Achievement_5: Habitat Awareness Stewardship

Achievement 5: Our three-year Upper St. John River Rare Plants Stewardship project has concentrated on riparian flora between the Maine-NB border and Perth Andover, NB. We have worked with NB Power to develop site conservation plans for their lands harbouring the globally-endangered Furbish's lousewort, and have encouraged hundreds of landowners to protect and steward their sensitive river-side habitats, through written and personal contacts. Twelve owners have signed voluntary conservation agreements; we are hopeful that in time, some of these will mature into permanent securement or formalized conservation agreements.

Current project 1: Upper St. John River Rare Plants Project: This year we hope to survey the upper river for threats to the riparian zone and areas of unlawful disturbance. We will continue to encourage owners of land with endangered species (Furbish's lousewort, Anticosti aster) to formally protect them in collaboration with the Nature Trust. We will develop a web site encouraging stewardship, a semi-permanent display of the rare flora, and other materials inviting voluntary conservation action.

Current project 2: The Trust is in the (hopefully) final stages of negotiating a working forest conservation easement on 2,300 acres of land on the banks of the St. Croix River, in New Brunswick. This will see several kilometers of river front permanently protected, along with 1.5 lakes, a stream and numerous rare plant habitats.

Current project 3: The Nature Trust is also on the cusp of a major campaign to raise funds to protect lands on Long Island, the largest island in the St. John--Kennebecasis River system. This Island is in the Kennebecasis River, and has roughly 2,500 acres of undeveloped land, although it is presently threatened by increasing numbers of severances and cottages.

GOM Summit Survey: Submit Completed Survey

Organization: **Nature Trust of New Brunswick**

Address: Box 603 Sta. A

City, State/Province: Fredericton, NB

Zip/Postal code: E3B 5A6

Submitted by: Jamie Simpson (jamies@ntnb.org) on Tuesday, September 07, 2004 at 06:41:31

Achievement_1: Habitat

Achievement_1-Description: Thomas B. Munro Memorial Shoreline: Creation of a new coastal nature preserve on Grand Manan Island, NB. 40 acres in size, and protects approximately 2km of undeveloped Grand Manan coast.

Achievement_2: Habitat

Achievement 2: Belding Reef Nature Preservce: Created a new coastal nature preserve near Chance Harbour, NB. Protects 14 acres of undeveloped coastal land.

Achievement_3: Habitat

Achievement 3: L'Etang Islands Nature Preserve: Created a new coastal nature preserve near Blacks Harbour, NB. Preserve contains 7 entire islands and one shore lot, totaling 85 acres.

Achievement_4: Habitat

Achievement 4: New River Island Nature Preserve: Created a new coastal Nature Preserve in Maces Bay by protecting the 33 acre New River Island.

Achievement 5: Dick's Island Nature Preserve: Created a new coastal Nature Preserve by protecting Dick's Island in the Passamaquaddy Bay. 3.5 acres in size.

Current project 1: The Nature Trust has an ongoing outreach project to coastal landowners in south-western New Brunswick. We are working with several landowners at present to create additional coastal nature preserves.

Current project 2: Working with landowners on Grand Manan to protect an Environmentally Significant Area near Whale Cove.

Current project 3: Working with a landowner near Chance Harbour to protect a portion of a saltwater marsh and dune.

GOM Summit Survey: Submit Completed Survey

Organization: **Parks Canada Agency**

Address: Fundy National Park of Canada

City, State/Province: Alma, New Brunswick

Zip/Postal code: E4H 1B4

Submitted by ; Edouard Daigle (edouard.daigle@pc.gc.ca) on Monday, September 13, 2004 at 08:09:50

Achievement_1: Habitat

Achievement_1-Description: Active monitoring (via swimming & electrofishing surveys) of Inner Bay of Fundy Atlantic Salmon since 1981, has provided a large mount of data on the species within Fundy National Park waters.

Actively involved in Inner Bay of Fundy Recovery since 2001.
Coordinate actions to implement the Inner Bay of Fundy Recovery plan. Primary goal is to establish and maintain in-river gene banks on priority federal lands within the Province of New Brunswick and in cooperation with DFO Maritime on the Big Salmon River priority watershed for New Brunswick.

Active implementation of two experimental strategies:
1- small population strategy using remaining population on Upper Salmon River within Fundy National Park.
2- gene bank supplementary using Big Salmon River supplemental gene bank stocks on the Point Wolfe River within Fundy National Park.

Results have included release of F1 adults into Pt Wolfe River in fall 2003 with full monitoring program; capture of smolts in Point Wolfe (2004) and Upper Salmon (2003 & 2004) rivers for inclusion in gene bank program.

Implementing incubation strategy for fall of 2004, that will include placing and monitoring in-river incubation baskets.

Achievement_2: Stewardship

Achievement 2: Provide Fort Folly First Nations the opportunity to be actively involved in Inner Bay of Fundy recovery by developing a multi-agency agreement between DFO, Parks Canada and Fort Folly First Nations.

The result has been active participation and training of first nation people in monitoring and capture of gene bank salmon in New Brunswick priority river. Without this human capacity many of the detailed actions could not be undertaken by DFO and Parks Canada.

Achievement_3: Habitat

Achievement 3: Active restoration of stream habitat within Fundy National Park. Including remediation work on fish passage issues and complete restoration of Dickson Brook flowing through the Fundy Golf Course.

This multi-year project takes into consideration the cultural aspects of a Stanley Thompson golf course and the needs of fish species within the stream.

Achievement_4: Contaminants

Achievement 4: In cooperation with our border community of Alma, develop a waste water (brown water) infrastructure project that will reduce the amount of raw sewage flowing into the Upper Salmon River estuary and the Bay of Fundy Ecosystem.

The result has been the development of a multi-government agreement and this $3.5 million project will be completed by 2005.

Achievement_5: Habitat

Achievement 5: An active partner in the Canadian Model Forest program since 1992, Fundy National Park is working with the partnership at the Fundy Model Forest to develop our understanding and capacity to deliver integrated watershed based habitat protection plans for the Pollett River, the Point Wolfe River and the Upper Salmon River. Recognizing that landowners and managers are key to final implementation of any strategies that integrate forest management and species habitat requirements in their operational plans requires direct involement in formulating a common understanding of the goals and objectives of protection and restoration strategies.

Current project 1: All achievements notes above are also ongoing projects.

GOM Summit Survey: Submit Completed Survey

Organization: **St. Croix International Waterway Commission**

Address: #5 Route 1

City, State/Province: St. Stephen. NB

Zip/Postal code: E3L 2Y8

Submitted by ; Lee Sochasky (staff@stcroix.org) on Saturday, September 04, 2004 at 15:52:47

Achievement_1: Habitat

Achievement_1-Description: In 1995, facilitating equivalent transboundary zoning regulations for freshwater and marine shorelands along the St. Croix (New Brunswick/Maine) boundary corridor.

Achievement_2: Habitat

Achievement 2: Researching and proposing international surface water quality standards for the international St. Croix (Maine/New Brunswick) watershed; hopeful implementation by 2005.

Achievement_3: Habitat

Achievement 3: Since 1990, working with governments, communities and user interests to permanently protect over 50 miles of international waterway for wilderness conservation and recreation values.

Achievement_4: Maritime activities

Achievement 4: Working with Maine and New Brunswick governments and communities to pursue projects that sustain local traditions and economy. These include:
* In 2004, world celebration of the 400th anniversary of the first French settlement in North America.
* Creation of a regional Downeast Heritage Center
* Maintenance of 50 ME/NB St.Croix public access & camp sites

Achievement_5: Stewardship

Achievement 5: Working with local communities and residents on:
* longterm water quality monitoring (freshwater & marine)
* innovative water quality improvement projects
* public participation in longterm water quality testing & improvement projects

GOM Summit Survey: Submit Completed Survey

Organization: **Sentinelles Petitcodiac Riverkeeper**

Address: P.O. Box 300

City, State/Province: Moncton, NB

Zip/Postal code: E1C 8K9

Submitted by: Daniel LeBlanc (info@petitcodiac.org) on Wednesday, March 31, 2004 at 10:47:10

Achievement_1: Habitat

Achievement_1-Description: Lead organization dedicated to advocating for the restoration of the Petitcodiac, designated Canada's Most Endangered River in 2003. In March 2000, launched comprehensive campaign around proposal to replace the existing causeway with a partial bridge. Gathered widespread community support for this proposal, now the subject of a 3 year, $4 million EIA review.

Achievement_2: Contaminants

Achievement 2: Initiated investigations in 2000 and 2001, into the discharge of toxic substances into tributaries of the Petitcodiac River (landfill leachate and textile mill effluent), which led to Environment Canada charges, court fines and clean up orders in access of $1 million to eliminate these discharges.

Achievement_3: Awareness

Achievement 3: Through public education, increased overall support in favour of restoring the endangered Petitcodiac River from 47% in 1999 to 59% in 2001 and 83% in 2003 according to public opinion polls carried out in the watershed.

Achievement_4: Stewardship

Achievement 4: With the assistance of hundreds of volunteers, retrieved over 44,000 lbs. of debris from 9 streams of the Petitcodiac River watershed from 2000 to 2002.

Current project 1: Campaign to restore the Petitcodiac River by replacing the causeway with a partial bridge enters its final stage in 2004 and early 2005. Federal government of Canada and the Province of New Brunswick set to decide on the future of the river by the spring of 2005. More details here: www.petitcodiac.org (causeway)

Current project 2: Completed two comprehensive project assessments into decommissioning two abandoned dams in our watershed. Currently fundraising for project removal phase. More details here: www.petitcodiac.org (abandoned

dams)

GOM Summit Survey: Submit Completed Survey

Organization: **Societe d'Amenagement de la riviere Madawaska et du lac Temiscouata inc.**

Address: 116 Victoria street

City, State/Province: Edmundston, N.B. Canada

Zip/Postal code: E3V 2H6

Submitted by: Monique Girouard (sarmlt@nbnet.nb.ca) on Monday, March 29, 2004 at 12:13:15

Achievement_1: Habitat Awareness

Achievement_1-Description: (2003) The SARMLT has completed the Water Classification exercise for its watershed according to the new Brunswick Department of Environment guidelines and regulations.

Achievement_2: Contaminants Awareness

Achievement 2: (2002-2004) The SARMLT proceeded to a more exhaustive study and evaluation of the status of the Madawaska river (tributary of the St-John river) related to different contaminants such as dioxins, furans, mercury, heavy metals, PCB, PAH.

Achievement_3: Habitat Awareness

Achievement 3: (1992) The Madawaska river had been used for a long for transportation of logs. The SARMLT proceeded to clean up the river and dig up a huge quantity of submerged log and debris of different sort.

Achievement_4: Habitat Awareness

Achievement 4: (1992)Establishment of the bike trail (40 miles) along the Madawaska river and the TÃ©miscouata lake to allow a protection zone of 66 feet along the river bank.

Current project 1: Project to reduce the E. Coli contamination (mostly from faulty septic tanks) of the Iroquois river (tributary of the St-john river).

Current project 2: Publication of a Newsletter: Le Verveine, twice a year at 9500 copies giving news about the watershed and different environmental issues.

Current project 3: Set up of the SARMLT WEB site, for environmental information, watershed issues and educational material and activities for schools.

GOM Summit Survey: Submit Completed Survey

Organization: **University of New Brunswick**

Address: Department of Biology, Bailey Hall

City, State/Province: Fredericton, New Brunswick

Zip/Postal code: E3B 6E1

Submitted by: Michael D. B. Burt (mburt@unb.ca) on Thursday, June 03, 2004 at 12:32:37

Achievement_1: Maritime activities

Achievement_1-Description: By analyzing the levels of total and methylmercury in the mud and in Corophium volutator, the main prey species for sandpipers, we are able to determine the loads of mercury picked up by semipalmated and lesser sandpipers on their staging grounds at the head of the Bay of Fundy prior to making their 4,000 km, non-stop flight to their wintering grounds in South America.

Achievement_2: Awareness

Achievement 2: By presenting papers on our findings, we have started to increase the public awareness of the stress caused by heavy metals (mercury) present at sub-acute levels causing chronic exposure of various organisms in natural food chains. These levels increase through bio-accumulation in organisms higher up the food chain.

Achievement_3: Contaminants

Achievement 3: Through increasing public awareness of the high levels of toxic metals (mercury) in various biota, including organisms consumed as human food, less mercury is being ingested which is a positive factor in preventing disorders attributable to mercury poisoning.

Current project 1: Monitoring mercury levels in mud, amphipods and snails on the mudflats at the head of the Bay of Fundy (Chignecto Bay and Minas Basin) as well as in sandpipers which feed on amphipods and snails. Relating these levels to levels found in birds at other stages of their circular migration (Bay of Fundy - staging; Venezuala - overwintering; Chesapeake Bay - staging; Northern Manitoba - breeding) is providing information on the cycling of mercury in these birds. By comparing the stress caused by mercury and the cumulative stress caused by parasites, will provide information on the extent to which the southward migration to South America is compromised by these two stressors.

Current project 2: In order to develop a cycling model of mercury in the coastal ecosystem, we are monitoring mercury

levels in precipitation (rain, snow, fog, particulate matter), in run-off into rivers and streams which flow into the Bay of Fundy (Upper Gulf of Maine), ground water in the coastal region as well as sea water. We are also monitoring mercury levels in freshwater biota (various invertebrates including filter-feeders such as clams and various fishes such as perch, smallmouth bass, and pickerel)and seawater biota (including filter feeders such as mussels and clams and various fishes at different levels of the food chain). We hope this will assist in the development of a model which will show how mercury is being cycled through the coastal ecosystem on the upper Gulf of Maine.

GOM Summit Survey: Submit Completed Survey

Gulf of Maine Council
Committees, Task Forces and Panels

Gulf of Maine Aquaculture Committee

This committee was active between 1999 and 2002 with members including the scientific and regulatory community as well as the aquaculture industry. The committee provided an opportunity for representatives of the GOMC member jurisdictions to better understand and address our respective aquaculture-environmental interactions through information sharing and coordinated action, where appropriate, within the context of our common ecosystem.
When council reorganized its committee structure in 2002, it identified this committee as not directly relevant to the current goals. In the six months before Council's decision on the future of the committee, members were working on a future workshop on Carrying Capacity. Committee members recognized the value of continued dialog among the jurisdictions and disciples represented.

Meeting Highlights:

1. Development of Mission Statement (Nov. 1999)
   1.1 "*to share information and recommend coordinated action relevant to the sustainable development of aquaculture within the Gulf of Maine ecosystem"*
2. Presentations at committee meetings:
   2.1 George Lindsay on: Summary of Chemical Analysis and Toxicity Tests on Sediments under Salmon Net Pens in the Bay of Fundy (March 2000)
   2.2 Barry Hargrave on: Environmental Studies for Sustainable Aquaculture (March 2001)
   2.3 Barry Hargrave on decision-making matrix for aquaculture siting (March 2001)
   2.4 John Sowles on analysis of oxygen/nitrogen budget in Blue Hill, Maine (March 2001)
   2.5 Karen Coombs and Jay Clement on codes of practice (Dec. 2001)
   2.6 John Sowles on: Maine water classification program and aquaculture monitoring (March 2002)
   2.7 Fred Page and Jennifer Martin on dissolved oxygen and the relationship with phytoplankton blooms (March 2002)
   2.8 US and Canadian Fish & Wildlife Services; Interactions between Aquaculture Operations and Seabirds_ (July 20002)

3. Roundtable of current activities per jurisdiction
   3.1 Includes updates on the EPA process to develop regulations for aquaculture

effluents in compliance with the National Clean Water Act

3.2 Includes tracking of activities for compliance to requirements under the designation of Maine salmon stocks as endangered

3.3 Includes updates on activities related to the development of Codes of Containment for aquaculture activity

3.4 Includes updates on research, regulatory activities and monitoring

4. Tours

4.1

July 1999 tour of Great Bay Aquaculture Farms Summer Flounder grow-out project.

- Increasing involvement of industry and NGO representatives
  - November 2000: Conservation Council provided two of their recent papers for discussion at the meeting and confirmed that when meetings are held in or nearer New Brunswick, they would attend.
  - September 2001: 22 NGO, or industry representatives present of the 58 participants in the Aquaculture Physical Remediation Workshop
  - March 2002---participation by representatives from the St. Croix Estuary Project and the Conservation Council of N.B. and interest in joining
  - July 2002---participation and interest in joining from the Conservation Law Foundation

On September 21 and 22, amid the aftermath of 911, the Committee held a workshop in St. Andrews, NB, on "Aquaculture Physical Remediation". The 55 attending, included aquaculture industry representatives, regulators, scientists, NGO's, managers and members of the general public. The workshop provided the opportunity for a consensus to develop on the very general quality guidelines that industry, regulators and the public are anticipating in future aquaculture development in the Gulf of Maine.

The workshop participants concluded that physical remediation is not practical on a large scale at this time. It has potential to be a tool but only as a last resort in most cases. Physical remediation research and study (methodologies) should continue within a policy-making framework.
The full report of the workshop, *Aquaculture Physical Remediation Workshop Report, is one of three reports published by the committee during its short life. The other two reports are:*

- *Aquaculture In The Gulf Of Maine: A Compendium Of Federal, Provincial And State Regulatory Controls, Policies And Issues.* This was published early in the history of the committee to help identify a direction for the first workplan.
- *Current Status Of Shellfish And Broodstock Movement And Disease Transfer Risks In The Gulf Of Maine Region.* This was the final document of the committee and reflected an interest in pursuing the issue of impacts of shellfish movement on both disease transmission and invasive species movement for the 2002 workplan.

Data Information and Management Committee

The Data Information and Management Committee (DIMC) was established to serve the data and information needs of the Council, Working Group and Committees and to facilitate access for researchers, government, non-profit organizations and the public, to data and information through development of Web tools and products.

The DIMC has developed an electronic data and information management system to organize and manage information about the GOM ecosystem (EDIMS) and to package it in a way that would be easily accessible and useable to many audiences. The EDIMS was put into operation in 1995. The network allows information in databases to be maintained and updated at their sources and to be accessible to people throughout the region. In 1997 the system was upgraded to include an email list server, a graphic bulletin board, a calendar of events and an address database. More recently, the creation of a homepage fo the GOMC at http://www.gulfofmaine.org offers access to Council announcements, documents, resource directories, databases, a document library and electronic data in both real-time and archive form.**seth's presentation**

Environmental Quality Monitoring Committee

Gulfwatch

The contaminants in mussels monitoring program of the Council (GOMCME), called Gulfwatch, has been running since 1991. It is co-chaired by the US and Canada, and is run by an active committee of the Council - the Environmental Quality Monitoring Committee. The Committee membership includes environmental managers from each jurisdiction and federal agencies ensuring close association between committee activities and management needs. Ongoing relationships with many other regional and international experts outside of the committee membership helps guide the scientific mission of the committee and the Gulfwatch program.

Products to date include:

A coordinated and standardized program for Blue Mussel monitoring in all 5 jurisdictions that border the GOM.

A. Data and information on chemical contaminants on the GOM
1) Data base (on GOMC web site) on trace contaminants in mussel tissues from the Gulf of Maine dating from 1991.
2) Tissue archive at the Bedford Institute of Oceanography.
3) Two primary research papers (Jones et al 2001; Chase et al. 2001). A good understanding of the presence, distribution and temporal trends of selected metals and organics in mussels for the entire Gulf of Maine region. The data continue to be collected and analysed, improving our understanding on the current types and levels of chemical contamination gulf wide.
4) Two graduate research theses (Mucklow 1996; Monette 2000).
5) Partnershiops with several related research projects (Elsie Sunderland, Watson - UNH; Bill Robinson- UMASS - Boston) and community groups (ACAP-St. John Project).
6) Impetus and framework for expansion fo the program in NH. Presently run by the NH Department of Environmental Services.
7) Support of related projects at specific sites of concern, including sites impacted by oil spills in Great Bay Estuary, Maine, and New Hampshire, Portland Harbour, Maine, and sites with evidence of historically elevated mercury in Stonington Maine.

B. Communication products re chemicals in the Gulf of Maine
8) Two fact sheets (with BoFEP and with the GOMC).
9) Two articles on monitoring in the Gulf of Maine Times.
10) One poster on Gulfwatch shown at numerous workshops.
11) An active PP presentations for talks; numerous talks at meetings.

A selection of text could be taken directly from the most recent GOMC fact sheet.

We can provide more detail if required, and the bibliography of published works.

GOM Habitat Conservation Sub-Committee Summary

The Habitat Conservation Sub-Committee was formed as part of the overall Gulf of Maine (GOM) Habitat Committee structure in the spring of 2003. This committee was established to focus on activities that assist in maintaining the integrity of coastal zone ecosystems from the landward extent of coastal watersheds to the furthest marine boundaries of the Gulf of Maine (GOM). The subcommittee is developing information and tools to assist managers, the public, and the scientific community in maintaining these ecosystems. Another goal of this group is to establish and strengthen partnerships to encourage conservation of the coastal zone.

The committee serves as a forum for sharing habitat conservation information and methods, identifying and coordinating conservation research and project needs, and finding ways to communicate information regarding the public. The subcommittee is currently working on the following three projects to meet these goals:

Inventory of tools for marine habitat conservation in the Gulf of Maine.

> The inventory gathers information about projects and organizations that have an active or long-term commitment to habitat conservation in the Gulf. Topics including oceanic conditions, marine contaminants, invasive species, marine resources, and marine protected areas, among others are focused on. Tools such as databases, maps, reports, and educational materials are highlighted. his project is an information gathering exercise to help the subcommittee identify activities and gaps related to habitat conservation. The inventory will be placed on the GOM website and will a source for the public to learn about ongoing marine habitat conservation activities in the GOM.

Identify major marine habitat types in the Gulf of Maine.

The subcommittee is working with the Massachusetts Office of Coastal Zone Management to expand their *Primer of Massachusetts Major Marine Habitat Types* to introduce and overview marine and coastal habitats in the entire Gulf of Maine. This guide will provide a general introduction to eelgrass beds, salt marsh, kelp beds, rocky habitats, sandy substrate, muddy substrate, shellfish beds, and water column habitats, among others. The distribution, ecological functions, economic and recreational values, threats, and management considerations are given for each habitat type. The subcommittee is establishing a scientific advisory panel from all states and provinces to contribute new information and review this project.

Assess the Impacts of Human Activities to Coastal and Marine Habitats in the Gulf of Maine.

This project compiles new and synthesizes existing information to evaluate human activities and their impacts to marine habitats in the GOM. The subcommittee is interviewing regional ecologists to document their views about the most important impacts that need to be addressed in the Gulf of Maine. Information is being gathered about what impacts have occurred, what future impacts are likely, the implications of these impacts on the GOM ecosystem, and potential options and management strategies to resolve the problems.

Habitat SubCommitteee; The Gulf of Maine Mapping Initiative

The Gulf of Maine Mapping Initiative (GOMMI), a subcommittee of the Gulf of Maine Council was established in 2001. The GOMC held a workshop in 2001 bringing together scientists, researchers, and managers, each of whom have specific mapping needs. The result of the workshop was GOMMI, a multiyear project to secure funding for and conduct a comprehensive mapping program of the region. To date GOMMI has produced several fact sheets, developed a strategic plan that was peer reviewed by regional experts and is now preparing a mapping needs assessment.

Submitted by Susan Snow Cotter, Massachusetts Coastal Zone Management, 251 Causeway St., , Boston, MA 02114.

Habitat Restoration Subcommittee
Improving Coastal Habitats in the Gulf of Maine Region

GOMC Habitat Restoration Subcommittee is charged with implementing, funding and educating about coastal habitat restoration in the Gulf, including tidal wetlands; riverine; subtidal and island, beach and dune habitats.

The Gulf of Maine Habitat Restoration Strategy provides a framework for focusing restoration efforts for important habitat types found in the Gulf of Maine. The Strategy identifies recommendations for managing restoration efforts in the Gulf as well as regionally significant projects in each of the Gulf's jurisdictions.

The Gulf of Maine Council / National Marine Fisheries Service Habitat Restoration Partnership was created in 2001 and consists of representatives from MA, NH, ME and the NMFS. The Partnership provides competitive grant funding for habitat restoration in the Gulf of Maine.

Funding for restoration projects in the Gulf from 2002-2004 has resulted in total of 30 projects funded throughout the Gulf. The projects have been leveraged with at least a 1:1 non-federal match and often much more. The total amount granted for all three years is $692,195. The total value of projects, including non-federal and all other match, is $4.6 million.

List of restoration projects funded:

Old Town Hill Salt Marsh Restoration Project, Trustees of Reservations
Damde Meddows Salt Marsh Restoration Project, Trustees of Reservations
Quivett Creek Salt Marsh and Fish Run Restoration, Town of Dennis
Marstons Mills Herring Ladder, Indian Ponds Assoc.
Town Brook Herring Run Restoration Project, Town of Plymouth
Third Herring Brook Restoration, Mass. Dept. of Fisheries and Wildlife
Wheeler Marsh Restoration Monitoring, York Conservation Commission
Habitat Survey and Monitoring Effects of Dam Removal to Fishery, River Rehab, Inc.
Sebasticook River Channel Restoration, Town of Newport
Dingley Island Tidal Flow Restoration, Town of Harpswell
Seaview Street Salt Marsh and Fishery Restoration, Town of Rockport
Volunteer Wetland Health Assessment Toolbox, Salem Sound 2000
Wiswall Dam Project: Study of Water Storage Mitigation Options, NH Dept. of Environmental Services
NH Marsh Monitors/Volunteer Saltmarsh Monitoring Program. Ducks Unlimited
Somerville Road NPS Reduction Project, Sheepscot River Watershed Council
Bridge Creek Salt Marsh Restoration Project, Town of Barnstable
Coastal Habitat Invasive Monitoring Program, Salem Sound Coastwatch
Oak Island Marsh Restoration and Flood Control Project, City of Revere
Sesuit Creek Herring Run Restoration, Barnstable County Resource Development Office
Harbor Road Marsh Restoration, Wells National Estuarine Research Reserve
Oyster Habitat Establishment and the Utilization of Remote Setting Techniques, Town of Barnstable
Cheverie Creek Salt Marsh & Tidal River Restoration Project, Ecology Action Centre
Eastern Point Salt Marsh Monitoring, Salem Sound Coastwatch
Third Herring Brook Fish Restoration, North and South Rivers Watershed Association
Woolen Mill Dam Fish Passage Improvement, Mass. Dept of Marine Fisheries
Presumpscot River Restoration Inventory, Casco Bay Estuary Project
East Elm Street Fish Ladder / Water Flow Improvement, Coastal Conservation Assoc.
Pemaquid Marsh Restoration, Town of Bristol

North East Aquatic Nuisance Species Panel

PO Box 3019
Boscawen, NH 03303
603.796.2615 $ info@northeastans.org
www.northeastans.org

NEANS
Northeast Aquatic Nuisance Species Panel

Final Report • November 10, 2003
US Fish and Wildlife Service Agreement Number 98210-1-G059

Hosted and coordinated by the Gulf of Maine Council on the Marine Environment, the Northeast Aquatic Nuisance Species Panel began its work in the fall of 2001. From November 26 through 27, thirty-five representatives from government, nonprofit, and private business gathered at the Seacoast Science Center in Rye, New Hampshire. Co-chaired by Susan Snow-Cotter, Massachusetts Coastal Zone Management and Tim Sinnott, NY Department of Environmental Conservation, the first meeting included overviews of federal and regional Aquatic Nuisance Species Programs, analysis of membership, and exploration of Panel and committee structure. Meetings have been well-attended with 25-50 participants at each event. In its first year, the Panel created a logo and drafted a Committee Structure and an Operation Framework and is currently finalizing its bylaws.

Michele L. Tremblay, naturesource communications and a contractor from the Ecology Action Centre are currently filling the Panel's staffing needs. A database of Panelists and other interested individuals has been created to manage membership. To facilitate communications, listserves have been created for the Panel and its committees. The Panel listserve is open to the public (with subscription information posted on the Panel's website) and is used to share news of events, exchange information, and facilitate discussion of ANS issues. It is expected that Panel membership will continue to evolve. It has been challenging to identify and recruit some interests represented by private business. The Panel agreed that it can best utilize private industry by involving and informing them through requests for review and comment on proposals and on emerging issues. Advisory task groups may be formed to facilitate this participation.

In additional to providing a forum for updates and discussions, Panel meetings have included two regular features. One is a training module on topics including communications and working more effectively with the media and a session on working with legislators. "Spotlight on Species" features a different marine or aquatic plant or animal with experts making presentations and answering questions. Water Chestnut and the Green Crab have been featured to date. The "Spotlight on Species" in December 2003 will feature *Codium* also known as "Dead man's fingers."

Each month, the NEANS Panel publishes the *NEANS Panel ANS Resource Digest* . The *Digest* features news, descriptions of new papers and research, events, and other ANS resources. The *Digest* is distributed to the Panel's public listserve and to other regional panels and is posted on the Panel's website.

The Panel produced a PowerPoint presentation about the Panel and ANS issues. It can be shown in its entirety or elements may be excerpted and incorporated into other presentations. The presentation was shown at several events including workshops and conferences in Hawaii, Boston, and New York.

Two temporary workgroups were formed to guide the development of the Panel website and database. The website can be viewed at www.northeastans.org with "pointers" from the alternative domains of NEANS.org and NEANSPanel.org. In addition to hosting the MarineID database (please see the next paragraph for further information on the database), the website serves as a clearinghouse for Panel activities. In addition to providing timely information about the Panel and ANS issues, the website contains meeting documents and resources including links to images and outreach guidance.

The Panel has contracted with the Marine Invertebrate Diversity Initiative (MIDI) to create the online database, "MarineID." The NEANS Panel is working with agencies, nonprofits, researchers, and others to identify appropriate data to populate the database. The Massachusetts Institute of Technology funded, in part, a proposal to the to develop the species database. With support from the US Fish and Wildlife Service, the project is slated for completion at the end of 2003 and will be housed on the NEANS Panel website.

This past year, several of the Committees worked with contracted interns to help implement the actions in their work plans. The Communications, Education, and Outreach committee produced an ANS fact sheet. It is available in hard copy or on the NEANS Panel website. The Committee also produced a *Hydrilla* Watch Card and a travelling display for the NEANS Panel. The CEO organized a media event at the May 2003 Panel meeting and worked with the Science and Technology Committee on researching priority species and collating public information for the Panel website. The Policy and Legislation Committee continues to update its ANS legislative matrix that inventories laws, rules, and other ANS policies. The Science and Technology Committee continued its work on creating and populating the MarineID database and the Rapid Response to Aquatic Species in the Northeast: Developing an Early Detection and Eradication Protocol workshop (please see below for further information). The newly-formed Ballast Water Committee is gathering membership and drafting a work plan. In October, it conducted a ballast water exchange workshop in Nova Scotia. The

NEANS Panel Committee work plans can be found on the Panel website.

In May 2003, the panel conducted a workshop, “Rapid Response to Aquatic Species in the Northeast: Developing an Early Detection and Eradication Protocol” (workshop proceedings are on the NEANS Panel website). The workshop was funded by a grant from NOAA Sea Grant. Over fifty participants met for two days to discuss a protocol. Implementation of the workshop recommendations is ongoing.
The next Panel meeting will be held December 11 and 12, 2003 at the Kellogg Environmental Center in Derby, Connecticut. The Panel meetings held to date include:
November 26 and 27, 2001 at the Seacoast Science Center, Rye, New Hampshire.
May 7 and 8, 2002 at the Quality Inn and Suites, Brattleboro, Vermont
December 16 and 17, 2002 at the US Fish and Wildlife Service, Hadley, Massachusetts
May 21 and 22, 2003 at the Bluenose Inn, Bar Harbor, Maine

Submitted by Michele Tremblay, Council Coordinator

Nutrient Task Force

Nutrient Workshop Follow-up

In 1999 NOAA released the National Estuarine Eutrophication Assessment: The effects of nutrients in US coastal waters. It states that 44 of 139 systems are considered to be highly eutrophic, and that 86 will develop worsening conditions by 2020. There is great interest in repeating the assessment to see if conditions have indeed worsened. Work has begun to assemble a national assessment, and the Gulf of Maine is herein proposed to serve as a pilot area for the assessment.

Work completed and Expected Timeline for As-Yet-Unfinished Outputs and Deliverables:
Last summer the National Steering Committee was organized and convened in Maryland for their first gathering. This two-day session produced a consensus on the direction NOS would pursue in revising/updating the National Estuarine Eutrophication Assessment. Within the Gulf of Maine region work began on organizing the Gulf of Maine pilot steering committee with a planned first meeting in June. Work also began on nutrient indicators that will contribute to the 2004 Gulf of Maine Summit.

The Steering Committee for the eutrophication assessment pilot project specific for the Gulf of Maine (an element of the larger national up-date) was active during the period. On June 18-19 the committee met at the University of New Hampshire to develop the region=s work plan and a strategy to collect nutrient data collected through monitoring programs and academic studies. Subsequently each state identified individuals with this data and an information request was mailed to them. (Elizabeth Mills B NOAA PMI B assisted with the compilation process in Maine.) Andrew Mason (student assistant to Suzanne Bricker) expects to follow-up with them in August and September. Complete 6/18-19 meeting minutes are available from Andrew Mason.

Public Education and Participation Committee
PEPC Timeline of Activities
1990-1999

November, 1990 Public Education and Participation Committee (PEPC) Conceived

PEPC was conceived to perform these functions:
Develop and implement a pubic education and communications strategy for the Gulf area.
Prepare and distribute public education materials; promote awareness of the Gulf ecosystem; and encourage communication and information exchange.
Serve as public relations committee for GOMC

April, 1991 PEPC Planning Meeting Convened
Over 60 delegates from the five jurisdictions participated in the meeting in Portland, Maine. Ideas from the meeting defined PEPC=s work plan and objectives, including:

achieve greater name recognition for the Gulf of Maine,
put together the educational facilities and points of access to the Gulf in a Gulf of Maine Trail,
investigate possibilities of the committee acting as a clearing house for Gulf of Maine education and outreach activities and information,
act as a bridge between Gulf of Maine researchers and the public through publications, events, and programs,
insert _Gulf of Maine_ information in all existing coastal and marine environmental programs and communications.

September, 1991 PEPC=s First Meeting

Fall, 1991 Gulf Links
(1,750 copies)
A resource listing of marine organizations in the Gulf of Maine region headed up by the ME Coastal Program. The publication initiates networking across the watershed region.

July, 1992 Gulf of Maine Watershed Map
(20,800 copies approximately)
The map has been hugely successful and been reprinted 4 times, most recently in 1999 . It depicts the watershed area as a geographic unit without political boundaries.

November, 1992 ATurning the Tide @ Vol.4, No.4
(Distributed to Council participants 4 times/year)
The newsletter began in March, 1989 and continued through 1993. At that time, PEPC decided to focus on reaching a larger audience in a more timely and interesting fashion and to increase the shelf life of its publications. Therefore, PEPC transitioned to other publications, including a Gulf Fact Sheet, Brochure and Almanac, and a magazine entitled AOur Common Heritage. @.

Winter 1992 Media Relations Plan
PEPC hired a Media Relations Coordinator who developed a plan to raise media and public awareness of the Gulf of Maine. An extensive list of media contacts was compiled, and numerous articles, news releases and other promotional materials were distributed.

February, 1993 Gulf of Maine Survey
A written and telephone survey of marine-related organizations was conducted. The survey was designed to facilitate information exchange, support Gulf-region organizations and help articulate a regional agenda. Information was included in the PEPC work plan.

August, 1994 State of the Gulf Fact Sheet
(10,500 copies)
The bulletin looks at the status and trends of contaminants in the Gulf of Maine and points out signs of stress on the environment that should be monitored, such as wetlands, shellfish areas, and endangered species.
August, 1994 Gulf of Maine Conference - Sustaining Our Common Heritage
PEPC helps to organize the Gulf of Maine Conference to elicit recommendations for the Council from its partners to be included in the 10-year Action Plan for the Council.

September, 1995 Program Highlights
(3000 copies per edition)
PEPC took on production of the Council=s bi-monthly newsletter from the Secretariat who had produced it for the previous two years. Program Highlights eventually melded into the Gulf Of Maine Times.

October, 1995 AA Sea Beside a Sea@ Brochure
(28,000 copies)
The Council received $10,000 from Eastman Gelatine Corp of Peabody, MA in 1994 to print the brochure. The brochure describes the biogeography of the Gulf and outlines the primary programs of the Gulf of Maine Council.

December, 1995 Wild Gulf Almanac
(7500 copies, 5000 funded by GOMC)

PEPC secured funding for the Almanac in late 1994. The Almanac highlights programs related to the Gulf from across the region. It was distributed by PEPC and resulted in a Visionary Award for its producer, The Chewonki Foundation, in 1995. Quarterly updates of the Almanac are available this year from Chewonki.

Winter/Spring, 1995 AOur Common Heritage@ Vol. 1
(5000 copies)The magazine highlights the efforts of citizens and community groups working locally to address regional concerns. The first edition included the Council=s Annual Report and feature stories from all five jurisdictions.

Summer, 1996 AOur Common Heritage@, Vol. 2
(5000 copies)
PEPC hired part-time staff in January, 1996 to produce the 2nd volume of Our Common Heritage. The staff person also completed a Media Relations Plan which kicked off the evolution of the Gulf of Maine Times.

August, 1996 National Marine Educators Conference
Identified as a need in a PEPC survey of NGO=s, the Council supported this conference, entitled AMaking Connections - Global Lessons in the Gulf of Maine.@ The conference helped PEPC work towards its goal of increasing participation in Gulf issues.

Fall, 1996 AShellfish Resources in the Gulf of Maine@ Bulletin
(5000 copies)
The fact sheet describes the natural, cultural and economic values of the Gulf=s shellfish resources. The bulletin is aimed at stimulating community efforts to reopen closed shellfish beds.

November, 1996 GOM Council Website

PEPC worked with the Data Information Management Committee to design the foundation of the Council=s website. MA CZM made changes to the website, and it was then improved by Environment Canada in Nova Scotia.

Spring, 1997 The Gulf of Maine Times
(12 editions, a 26%increase from 10,400 to 14,000 readers,)
A highly respected, very well distributed, educational publication that is a well established medium containing important and interesting information on issues in the GOM watershed.

October, 1998 Gulf of Maine Undersea Landscapes Poster
(15,000 copies)
Headed up by ME State Planning, PEPC produced the Undersea Landscapes Poster that has been distributed

throughout the watershed to teachers and educators. A companion website is currently under development.

September, 1999 Gulf of Maine Times Evaluation

Headed up by the NH Coastal Program, a postcard survey was mailed to 3000 readers and received a 15.28% response rate. Readers overwhelmingly endorsed the Gulf of Maine Times as a valuable information source of the Gulf of Maine.

Sewage Task Force

A workshop on sewage management was held April 11-12, 2002 at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia. The workshop was sponsored by the Gulf of Maine Council hosted by the NS Department of Environment and Labour. The purpose was two fold – to review issues related to the management of sewage and wastewater and its impacts in the Gulf of Maine and its estuaries and embayments, and to recommend actions for both the GOM Council and other groups engaged in this issue.

Presentations were given on the status of sewage and wastewater management from the perspectives of US and Canadian federal, US state and Canadian Provincial agencies from Nova Scotia, new Brunswick , Maine, New Hampshire, and Massachusetts. In focused discussion groups, the participants addressed the following topics: public education, ecosystem health, costs and benefits, innovative approaches, funding mechanisms, and regulation and enforcement. Four case studies were presented as management models to stimulate discussion.

The sessions and subsequent discussions produced many recommendations. Four key recommendations emerged as the most relevant to the Gulf of Maine Council:
-raising awareness with respect to wastewater management;
-establishing the link between sewage discharges and ecosystem and human health; and
-socio-economic impacts of sewage discharge.
The GOM Working Group recommended that Council consider:
-an assessment of the status of sewage management in each jurisdiction, including a measure of performance of the Council's ability to influence and improve jurisdictional practices in sewage management
-reporting on an annual basis on the progress for each jurisdiction
-facilitating cross-jurisdictional sharing of information
-sponsoring a second sewage workshop 2-3 years from the original workshop
-preparation of a draft document describing the components of a jurisdictional assessment of sewage management and the development of improvement and performance measures.

The Sewage Task Group subsequently developed an implementation plan which described each activity, identified for each activity, timeframes, potential partners, contacts and linkages, a draft budget and potential funding sources.
Key activity areas include:

a) **Inventory** (Update and maintain a current inventory of point source treated and untreated sewage in the GOM watershed, including a description of levels of treatment at each site. Map those using appropriate GIS techniques; Develop an electronic database of proven innovative technologies or approaches for sewage management, including a list of expert contacts and funding sources for research and development and for improved sewage

management.

b) Human Health and Environmental/Ecological Risk Assessment (Produce an updated technical review of human and ecological health risks and impacts of sewage/municipal effluents with emphasis on the GOM. Build upon previous reviews; Identify the key contaminants of ecological concern in regional sewage(other than nitrogen and pathogens) including other nutrients with special consideration of EDC's ; Using GIS, map the locations in the GOM of STP's and other sources of sewage/municipal effluent and map/document areas of human and ecological health risks; and enhance Gulfwatch funding so as to enable application of selected additional indicators for monitoring sewage constituents/impacts, and recovery in inshore waters (emphasis would be on pathogens) .

c) **Raising Awareness -** Public Communication (review and synthesis of data/information from existing scientific literature; review and approval by GOM WG; printing and distribution of publications/maps; identification and use of indicators).

d) **Socio-Economic Consequences** (identify and use effective tools to assess the environmental and socio-economic consequences of sewage discharge to the GOM for one or more pilot area(s).

e) Identification of Research needs and development of pilot projects (Select 1-2 areas within the GOM region to conduct a pilot project(s) to demonstrate and to provide lessons on how best to utilize/apply socio-economic tools to sewage management situations; Develop and test a model in a given pilot area, to assess the opportunity cost of sewage discharge to the GOM; Develop general improvement and performance measures for consideration by each jurisdiction in developing, updating, and evaluating sewage management plans and progress. Report on an annual basis the progress for each jurisdiction)

f) old a second GOM Sewage Management Workshop (Hold a GOM workshop/trade show on innovative technologies and approaches to sewage management;. Sponsor (in partnership) a second GOM Regional Sewage Management Workshop in 2005-2006 to discuss progress)

The Sewage Task Force is in process of implementing this plan.

Special Events

Gulf of Maine Summit

The Gulf of Maine marine waters and shoreline habitats encompasses three states and two provinces and is home to over 2,000 species of plants and animals. This ecosystem faces important environmental challenges, and concerned citizens from diverse backgrounds are organizing a series of events leading to a Gulf of Maine Summit to develop Gulf-wide responses to these environmental concerns. It is the goal of the Gulf of Maine Summit to develop an action plan that will improve through conservation, protection, restoration, and sustainable development the health of the ecosystem of the Gulf of Maine and its watershed. This process has included a series of community forums and preparation of this State of the Gulf Report which leads up to the Gulf of Maine Summit and the events that are part of it.

By building on the many local watershed forums that have been held since 2002 and integrating local, traditional, and historical knowledge with scientific knowledge to describe the condition of the Gulf of Maine, the participants will develop a clear vision of the future of the Gulf of Maine region and its watershed . They will design specific actions and strategies that will help interested citizens, business, and organizations from around the Gulf of Maine region to move forward with conservation, protection, restoration, and sustainable development efforts in the region. By developing a series of indicators we will be able to track our progress for years to come. The Summit will celebrate 15 years of cooperation and policy development in the Gulf of Maine and advocate for enhanced science, management, and policies.

Planning, Agenda, and Logistics Committees have been set up to plan and coordinate events leading up to and including a Gulf of Maine Summit, and the production of a State of the Gulf report, a post Summit report, and educational documents. These events will help develop an action plan that will enable and assist communities to move forward with conservation, protection, restoration, and sustainable development efforts in their regions.

As part of the pre-Gulf of Maine Summit activities, the Planning Committee would like to hold the following three events held in St. Andrews, New Brunswick , from October 25 to 26, 2004:

#1 A Workshop for Gulf of Maine Coastal Wetland Restoration: This workshop will be specifically tailored for Municipal Officials, Managers and Planners; Public Works Directors; Conservation Commissioners; Land Trust Members; Natural Resource Professionals, and community members concerned about the health of coastal habitats now and for future generations. The Gulf of Maine Council/National Oceanic and Atmospheric Administration Habitat Restoration Partnership will jointly provide guidance for developing an d implementing community-based restoration projects.

#2 Interpretation for Tourism: Quality interpretation was identified as a key component to successful geotourism. AGeotourism@ is about preserving a destination 's geographic character, encompassing both environmental and cultural elements that make one place distinct from another. This event will highlight the importance of interpretation through an investigation of best practices for quality environmental interpretation for various tourism operators in the Gulf of Maine/ Bay of Fundy area, including presentations of current best practices. Bruce White, owner of Seascape Kayak in St. Andrews and a member of the Gulf of Maine Council Sustainable Tourism Task Force will host this event.

#3 Stewardship: Building Community Capacity for Resource Conservation and Restoration. The Public Education and Participation Committee of the Gulf of Maine Council will present the Stewards projects from Maine, which engaged coastal residents in planning for their communities and volunteering in a variety of stewardship activities. We will also incorporate the concept of collaborative processes for community problem solving. This will introduce the participants to the next phase of the community capacity building that will be implemented in 2004-2005 in a series of workshops in each of the Gulf of Maine jurisdictions to help implement stewardship programs and develop more productive community collaborations for conservation.

The Gulf of Maine Summit will be held in St. Andrews, New Brunswick , from October 27 to 29, 2004. The participants of the Summit will develop a clear plan for addressing the concerns of the Gulf of Maine and its watersheds and developing a series of indicators that will enable us to track progress in the Gulf of Maine region for years to come. Issues to be addressed include:
Priorities for the Gulf of Maine Council=s 2006-2011 Action Plan.
Mechanism/tools to enable and assist communities to move forward on local-level recommendations to protect and enhance the Gulf of Maine and its watershed.
Improvements to reporting mechanisms and indicators to be used for future reports.
Priorities to integrate environmental monitoring and ocean observing via the Gulf of Maine Ocean Observing system.
Improvements to provincial, state, and federal coastal and marine regulatory and planning programs.

As part of the post-Summit activities a proceedings document will be created that will provide a detailed record of the event. This will be used by concerned citizens, businesses and organizations from around the Gulf of Maine region as a reference. A public education document/brochure about the Gulf of Maine area explaining the Summit as a process and how concerned individuals can get involved will also be created to be used as an educational tool to be distributed to regional schools, communities, and concerned individuals.

+
The Gulf of Maine is facing serious environmental challenges. Point-source pollution is mostly regulated and is not the major problem. Non-point sources of pollution (from vehicles, pavement run-off, etc.), combined with land uses that indirectly affect the marine environment are most threatening to the long-term health of the Gulf of Maine. The Summit and the events leading up to the Summit, will seek collaborative approaches and solutions for better management of the area=s resources (both commercial and non-commercial) resulting in long-term improvement of

the quality of the marine ecosystem. Through activities such as geotourism, sustainable development of the Gulf of Maine region can be obtained and benefit the citizens, businesses of the area, and the community in general for the long-term.

Affiliated Agencies

Organization: **Canada Dept of Fisheries & Oceans**

Address: 531 Brandy Cove Road

City, State/Province: St Andrews NB

Zip/Postal code: E5B 2L9

Submitted by: Jack Fife (fifej@mar.dfo-mpo.gc.ca) on Thursday, June 03, 2004 at 12:39:19

Achievement_1: Habitat Maritime activities Awareness Stewardship Other

Achievement_1-Other_category: Provide infrastructure (plankton sample) for investigators

Achievement_1-Description: The plankton working group - There are now proper shelves installed at the Atlantic Reference Centre. Plankton samples going back as far as 1960 are easily accessible from many areas with the Bay of Fundy.

Current project 1: We are expecting an investigator from Australia who will be looking at getting numeric estimates of several taxa using the optical plankton counter from Bedford Institute of Oceanography.

GOM Summit Survey: Submit Completed Survey

Organization: **Geological Survey of Canada (Atlantic)**

Address: P.O. Box 1006

City, State/Province: Dartmouth, Nova Scotia

Zip/Postal code: B2Y 4A2

Submitted by: Brian J. Todd (Brian.Todd@NRCan.gc.ca) on Thursday, June 03, 2004 at 13:00:00

Achievement_1: Other

Achievement_1-Other_category: Sea floor mapping

Achievement_1-Description: Mapping the Gulf of Maine seafloor is one of the essential first steps for achieving effective management of the region's marine environments.

The Gulf of Maine Mapping Initiative (GOMMI) is a U.S.-Canadian partnership of government and nongovernment organizations to conduct comprehensive seafloor imaging, mapping, and biological and geological surveys. GOMMI grew out of a mapping workshop in October 2001 that was sponsored by the Gulf of Maine Council on the Marine Environment and the National Oceanic and Atmospheric Administration. The Gulf of Maine Council endorses GOMMI, and the GOMMI Steering Committee is a subcommittee of the Council. Currently, GOMMI is working to secure funding and conduct a mapping program of areas in the Gulf of Maine not already covered by multibeam sonar surveys.

GOMMI has released its strategic plan for review and comment; the document can be downloaded at www.gulfofmaine.org/gommi/.

Achievement_2: Other

Achievement_2-Other_category: Benthic habitat mapping

Achievement 2: Within the Geological Survey of Canada, the Geoscience for Ocean Management Program (http://gom.nrcan.gc.ca) is developing a national sea floor mapping strategy. This strategy links with other Canadian federal government departments, academia, and the private sector to establish high-priority mapping areas. The focus on standard methods and standard outputs will facilitate the discovery and access to marine geoscience knowledge and data through web-based data discovery tools and enhance delivery of map products. A set of four " flagship's map sheets was produced for Browns Bank, a 3056 square kilometer area on the Atlantic continental shelf off Nova Scotia. The first two maps in the set are

based on a regional multibeam sonar survey, and the latter two value-added maps are based on the multibeam data interpreted in conjunction with extensive geo- and bioscience groundtruth surveys. Sheet 1 shows the sea floor topography of Browns Bank in shaded relief view and colour-coded to depth. Descriptive notes detail the data collection, data display and the general geomorphology of the region. Sheet 2 shows coloured backscatter strength in shaded relief view. Descriptive notes outline the principals of backscatter strength and its relationship to sea floor geological materials, and depict the backscatter distribution in the map area. Sheet 3 shows sea floor topography in shaded relief view with colour-coded surficial geological units interpreted from geophysical profiles, sea floor photographs and sediment samples. Sheet 4 shows sea floor topography in shaded relief view with colour-coded benthic habitat. Statistical analyses of benthic fauna, identified to the lowest taxonomic level, distinguished habitats based on substrate, habitat complexity, current strength and water depth.

Currently, about 20,000 square kilometres of the Canadian portion of the Gulf of Maine has been surveyed using multibeam and subsequent groundtruth work (German, Browns and Georges Banks and Northeast Channel). All the resulting maps are scheduled for release by 2007.

Achievement_3: Other

GOM Summit Survey: Submit Completed Survey

Organization: **Maine Department of Marine Resources**

Address: PO BOX 8

City, State/Province: West Boothbay Harbor, ME

Zip/Postal code: 04575

Submitted by: Amy M. Fitzpatrick (amy.fitzpatrick@maine.gov) on Tuesday, June 01, 2004 at 06:06:12

Achievement_1: Contaminants Awareness Stewardship

Achievement_1-Description: The Public Health Division of the ME Department of Marine Resources classifies the shellfish growing areas in the state according to the National Shellfish Sanitation Program. We classify areas for harvest or grow-out. We use volunteers to monitor water quality, do shoreline survey work and monitor phytoplankton. The public and industry are more aware of why areas are closed for shellfish harvest and that translates into greater awareness of protecting and restoring shellfish habitats.

Achievement_2: Contaminants Awareness Stewardship

Achievement 2: The mission of the Public Health Division (of the Maine Department of Marine Resources) is to implement and manage a shellfish program to protect public health by assuring that shellfish is safe for human consumption.

Achievement_3: Contaminants Awareness Stewardship

Achievement 3: We provide tours of our facility and educate the public through outreach activities. We also publish brochures topics relating to shellfish processing and one entitled "Why are areas closed?". We have an informative website (that is getting better all the time).

GOM Summit Survey: Submit Completed Survey

Organization: **Massachusetts Coastal Zone Management-Wetlands Assessment Program**

Address: 251 Causeway Street, Suite 800

City, State/Province: Boston, MA

Zip/Postal code: 02114

Submitted by Bruce K. Carlisle (bruce.carlisle@state.ma.us) on Tuesday, June 01, 2004 at 06:32:20

Achievement_1: Habitat Contaminants

Achievement_1-Description: To date, there has been little systematic effort to measure, document, and describe the condition of wetlands. To address this, since 1995, CZM has been actively working on projects to advance wetland assessment methods and approaches.

The goals of the program are:
1. To develop and evaluate techniques for assessing the ecological integrity of coastal wetlands in order to:
-- Inventory of wetland sites in specific areas;
-- Report on wetland condition;
-- Identify degraded wetland sites;
-- Evaluate restoration potential; and
-- Monitor restoration response.
2. To transfer techniques to interested parties, with an emphasis on training and assisting volunteers.
3. To convey the assessment methods and results to coastal wetland decision-makers.

Projects
1. Development of biotic indices for coastal tidal wetlands (salt marshes:
-- Waquoit Bay 1995-1997;
-- North Coastal and Ipswich Watersheds 1998-1999; and
-- Cape Cod Bay 1999-2000.
2. Long-term investigation for indicators of coastal wetland restoration, Cape Cod (2001-2005+).
3. A systematic assessment of tidal vegetated wetlands in Massachusetts and Rhode Island using a 3-tier approach (W/ EPA-AED and other partners; 2000-2005+).

GOM Summit Survey: Submit Completed Survey

Organization: **MA Coastal Zone Management-Wetlands Restoration Program**

Address: 251 Causeway Street, Suite 800

City, State/Province: Boston, MA

Zip/Postal code: 02114

Submitted by: Bruce K. Carlisle (bruce.carlisle@state.ma.us) on Tuesday, June 01, 2004 at 06:24:58

Achievement_1: Habitat

Achievement_1-Description: Founded in 1994, the goal of the Wetlands Restoration Program (WRP) is to coordinate and support voluntary, pro-active restoration of degraded or former wetlands.
In 2003 the WRP was transferred to the Office of Coastal Zone Management (CZM).
The Program works in a network of partners, including:
-- Federal agencies, such as NOAA, ACOE, EPA, NRCS;
-- Other state agencies: Riverways, DMF, DCR; and
-- Corporate Wetlands Restoration Partnership), and project sponsors.
WRP provides (or provides for) a range of assistance, including:
-- ID restoration sites;
-- develop plans;
-- assess project feasibility;
-- prepare engineering designs;
-- obtain permits;
-- oversee bids and construction;
-- monitoring; and
-- delivering outreach and education.
Since 1994, the program has worked with a diverse array of partners to complete 34 projects, totaling more than 450 acres under restoration.
The WRP has leveraged over $13.6 million of non-State funds, largely Federal but with significant private and NGO contributions.
11 comprehensive restoration planning projects have been completed:
--Tide restriction inventories for nearly the entire coast (Boston Harbor watershed and SE Islands remaining), and
-- Plans that identify other restoration opportunities: such as filled and drained sites.
Currently the Program has 33 active projects; approximately 75% of which are tide-restriction restorations.

Organization: **Massachusetts Department of Environmental Protection**

Address: 627 Main Street

City, State/Province: Worcester, MA

Zip/Postal code: 01608

Submitted by:Andrea Langhauser (Andrea.Langhauser@state.ma.us) on Thursday, March 11, 2004 at 12:37:11

Achievement_1: Habitat Awareness

Achievement_1-Other_category: monitoring and assessment of surface water quality

Achievement_1-Description: The MA DEP Division of Watershed Management has published surface water quality assessment reports for eight of the 11 major watersheds within the Massachusetts portion of the Gulf of Maine within the last five years. The reports were generated by DEP DWM as part of the five-year Basin Cycle and reporting requirements of Section 305(b) of the Clean Water Act. Documentation of data used to assess the status of surface water quality conditions is provided from DEP DWM as well as other sources of current, quality assured water quality information.
The following reports have been published between 2000 and 2003 and can be viewed in their entirety on the DEP Internet site at http://www.state.ma.us/dep/brp/wm/wmhome.htm

Boston Harbor 1999 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published October 2002.

Cape Cod Water Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published October 2002.

Charles River Basin 1997/1998 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1997/1998. Published February 2000.

Merrimack River Basin 1999 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published November 2001.

Nashua River Basin 1998 Water Quality Assessment Report is based on available information including DEP DWM data generated

in 1998. Published January 2001.

North Coastal Watershed 1998 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1997/1998. Published May 2000

The Shawsheen River Watershed is based on available information including DEP DWM data generated in 2000. Published July 2003.

Parker River Watershed Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published August 2001.

Achievement_2: Habitat Contaminants Awareness Stewardship

GOM Summit Survey: Submit Completed Survey

Organization: **Massachusetts Department of Environmental Protection**

Address: 627 Main Street

City, State/Province: Worcester, MA

Zip/Postal code: 01608

Submitted by: Andrea Langhauser (Andrea.Langhauser@state.ma.us) on Thursday, March 11, 2004 at 12:37:11

Achievement_1: Habitat Awareness

Achievement_1-Other_category: monitoring and assessment of surface water quality

Achievement_1-Description: The DEP Division of Watershed Management has published surface water quality assessment reports for eight of the 11 major watersheds within the Massachusetts portion of the Gulf of Maine within the last five years. The reports were generated by DEP DWM as part of the five-year Basin Cycle of the Commonwealth and the reporting requirements of Section 305(b) of the Clean Water Act. Documentation of data used to assess the status of surface water quality conditions is provided from DEP DWM, as well as other sources of current, quality assured water quality information. The following reports have been published between 2000 and 2003 and can be viewed in their entirety on the DEP Internet site at http://www.state.ma.us/dep/brp/wm/wmhome.htm

Boston Harbor 1999 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published October 2002.
Cape Cod Water Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published October 2002.
Charles River Basin 1997/1998 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1997/1998. Published February 2000.

Merrimack River Basin 1999 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published November 2001.

Nashua River Basin 1998 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1998. Published January 2001.

North Coastal Watershed 1998 Water Quality Assessment Report is based on available information including DEP DWM data generated in 1997/1998. Published May 2000

The Shawsheen River Watershed is based on available information including DEP DWM data generated in 2000. Published July 2003.

Parker River Watershed Quality Assessment Report is based on available information including DEP DWM data generated in 1999. Published August 2001.

Achievement_2: Habitat Contaminants Awareness Stewardship

Achievement 2: The MA DEP has awarded over $ 7.3 million for 59 projects in the MA watersheds within the Gulf of Maine during FFY 1996 and 2002 from the 104b3, 604b, 319 grant programs. See the DEP website for copies of the individual Indicative Project Summaries: http://www.state.ma.us/dep/brp/mf/othergrt.htm

Achievement_3: Habitat Contaminants

Achievement_3-Other_category: monitoring and assessment

Achievement 3: The DEP Division of Watershed Management has completed water quality restoration plans known as Total Maximum Daily Load reports (TMDLs) within the MA portion of the Gulf of Maine watershed. In 2002, the US EPA approved bacteria TMDLs for 37 segments within the Shawsheen River (Merrimack River subwatershed) and Neponset River and Little Harbor, Cohasset (Massachusetts Bay subwatershed). The reports can be viewed or downloaded from the Internet at http://www.state.ma.us/dep/brp/wm/wmhome.htm

Achievement_4: Habitat Contaminants

Achievement 4: MA DEP has issued National Pollution Discharge Elimination System (NPDES) permits and awarded State Revolving Loan Funds for upgrades to coastal wastewater treatment plants (WWTPs) and landfill closures. For more information contact Paul.Hogan@state.ma.us. Examples of the more significant improvements over the last 15 years include the following.
The Massachusetts Water Resource Authority upgraded the Greater Boston WWTP on Deer Island to secondary treatment in 1999/2000 with the construction and operation of a 9- mile ocean tunnel and diffuser. The design flow is 1.2 Billion Gallons per Day; the average flow is 500 million gallons per day (MGD).

South Essex Sewer District in the North Coastal/

Massachusetts Bay subwatershed upgraded the WWTP with secondary treatment for 40 MGD discharge.

The Town of Plymouth began operation at an upgraded WWTP in 2002 that provides tertiary treatment for all wastewater flows; the 0.75 MGD discharged into the ground and the 1.75 MGD discharged into Plymouth Harbor (Massachusetts Bay). The Salisbury WWTP was also upgraded to tertiary treatment (North Coastal, Massachusetts Bay).

The Scituate WWTP was upgraded to secondary treatment that includes nitrogen removal. The NPDES permit allows 1.6 MGD to be discharged into a tributary leading into Massachusetts Bay with the amount of total nitrogen discharged not to exceed a yearly average of 39.5 lbs/day.

The RESCO landfill in the Rumney Marsh Area of Critical Environmental Concern, Saugus was closed; trash is now handled at the RESCO Resource Recovery Plant.

Achievement_5: Habitat Awareness

Achievement 5: MA DEP has posted annual reports outlining the statewide Compliance and Enforcement performance during the years 2000 through 2003 that can be viewed on the Internet at: http://www.state.ma.us/dep/enf/enfpubs.htm. This includes a listing of Supplemental Environmental Projects and actions begun in 2004 such as the Wetlands Enforcement Initiative. Through a computer assisted analysis of aerial photos of wetland resources taken over the last decade and an investigation into the causes of wetland destruction, DEP has determined that at least half of the wetlands losses in Massachusetts are the result of illegal activity. DEP intends to put a stop to illegal wetlands filling and as a first step is undertaking an aggressive enforcement initiative. The enforcement actions will publicize our new capacity to find illegal fills even when away from public view, and our intention to require restoration and impose significant penalties, with the goal of preventing wetlands destruction by providing strong and effective deterrence.

Current project 1: : The MA DEP DWM is compiling surface water quality assessment reports for remaining 3 major watersheds within the Massachusetts portion of the Gulf of Maine; namely the Ipswich River, Concord River, and South Coastal Watersheds. The reports are generated by DEP DWM as part of the five-year Basin Cycle of the Commonwealth's Watershed Initiative and reporting requirements of Section 305(b) of the Clean Water Act. Documentation of data used to assess the status of surface water quality conditions is provided from DEP DWM, as well as

other sources of current, quality assured water quality information. The final assessment reports will be posted on the DEP website.

Current project 2: The following 3 TMDLs are under development and expected to be finalized or available for public comment in 2004.
A Draft Stormwater Pollutant TMDL for the Headwaters of Shawsheen River has undergone public review and is being finalized. A Draft TMDL for Total Phosphorus in eight segments of the Assabet River (Merrimack subwatershed) will be available for public comment in March 2004. The pollutants to be addressed are nutrients (in 7 segments) and Organic Enrichment and Low Dissolved Oxygen (in 6 segments). Draft Total Maximum Daily Loads of Phosphorus for 12 lakes in the Shawsheen and Ipswich River Watersheds (Merrimack and Mass. Bays subwatershed, respectively) are expected to be available for public comment during 2004. These reports will address Noxious Aquatic Plants, Turbidity; and Nutrients.

Current project 3: Combined Sewer Overflow (CSO) construction projects, funded in part by the State Revolving Loan Fund, will minimize the number of storm events that discharge flow into the MA coastal waters. CSO projects are ongoing in the cities of Boston, Cambridge, Somerville, Chelsea as well as in the Merrimack River cities of Lowell, Lawrence and Haverhill. Contact Paul.Hogan@state.ma.us for more information.

GOM Summit Survey: Submit Completed Survey

Organization: **New Hampshire Department of Environmental Services**

Address: 29 Hazen Drive, PO Box 95

City, State/Province: Concord, NH

Zip/Postal code: 03302-0095

Submitted by: Stephanie Lindloff (slindloff@des.state.nh.us) on Thursday, April 22, 2004 at 11:03:55

Achievement_1: Habitat

Achievement_1-Description: The NH DES is one of only two states in the country to have a program focused on restoring rivers and eliminating public safety hazards through the selective removal of dams. This program has led efforts to either remove dams or install fish passage on several important coastal rivers in the NH, including the Lamprey, Winnicut, Bellamy, and the Cocheco rivers. All projects have a primary goal of re-establishing free passage of anadromous fish, which play a vital role in the health of the Gulf of Maine.

GOM Summit Survey: Submit Completed Survey

Gulf of Maine Accomplishments and Activities Supported by the NCCOS, Center for Sponsored Coastal Ocean Research

Accomplishments

An increased understanding of the ecology and oceanography of toxic *Alexandrium* blooms in the Gulf of Maine - These long-term, ecosystem scale studies conducted through the ECOHAB-Gulf of Maine project investigated the physical, biological, chemical, and behavioral mechanisms underlying population abundance and distribution of Alexandrium in several key habitats and characterized the transport pathways that link them. Extensive field studies included both moored and shipboard hydrographic observations, nutrient conditions, and population distributions (including benthic resting cysts) within the Casco Bay region, the Eastern Maine Coastal Current, and the southern Bay of Fundy. This information was used to construct a physical-biological coupled model for the western Gulf of Maine which is currently undergoing additional refinements for possible use as a forecasting tool to understand the seasonal population dynamics and the mechanisms for delivery of toxic cells to shellfish within the region.

An increased understanding of the ecosystem dynamics of Georges Bank and the Gulf of Maine - Research results funded through the GLOBEC Georges Bank program has helped to understand the population dynamics of key species on the Bank - cod, haddock, and two prey species of zooplankton - both in terms of their coupling to the physical environment and their predator/prey relationships. The effort was substantial, requiring information on many scales involving retrospective analysis, extensive field surveys, and modeling studies. The final phase of the program is focusing on analysis and synthesis of the field results, with special attention to physical/biological modeling, climate effects, and development of indices to characterize environmental and ecosystem status/change. Results are leading to the development of models capable of providing new, ecosystem-based estimates of abundances and distributions for improved fishery forecasts which will then be provided routinely to the NMFS Northeast Fisheries Science Center and to the New England Regional Fishery Management Council.

Gulf of Maine Modeling/Management Workshop - The creation of model products (i.e. forecasts) to help managers make more informed environmental resource decisions is a major end product that NOAA expects out of its sponsored research projects. Transitioning research models, such as those developed through the ECOHAB and GLOBEC programs, to useful, user-friendly forecasting tools is a difficult and complex task often requiring an active dialog between the research and management community. For these reasons, CSCOR supported a workshop in 2002, to bring together researchers in applied modeling activities and representatives of various public agencies to identify the informational needs of fishery and harmful algal bloom resource managers and to highlight the capabilities of models developed through research programs in the Gulf of Maine. The goal was to organize future transition efforts around forecasts which are critically important to resource managers but are also tractable with the suite of models available. This workshop will be the first of a series building toward an 'operational modeling framework' in the Gulf of Maine region that will enable pro-active forecasting to be implemented to safe-guard coastal living resources, local economies, and the public health. A workshop report is available at http://www.cop.noaa.gov/pubs.html.

Ongoing Activities

ECOHAB: Predictive models of the toxic dinoflagellate Alexandrium fundyense in the Gulf of Maine: quantitative evaluation, refinement, and transition to operational mode for coastal management - This project began in 2002 and continues the model development initiated in the ECOHAB: Gulf of Maine project. Coupled physical-biological models of Alexandrium fundyense in the Gulf of Maine have matured to the point that it is now feasible to assess their suitability and potential value in an operational context. The final product is expected to be a detailed implementation plan for a system to carry out operational forecasting of Alexandrium fundyense in the Gulf of Maine, including the identification of possible academic, public, or private institutions where the operational model might be housed.

Targeted Harmful Algal Bloom research projects - NCCOS has a number of ongoing targeted research efforts in or applicable to the Gulf of Maine which are funded through the ECOHAB program. The following efforts are underway (only titles listed):Control of harmful algal blooms using clays:Phase II; Ecology of benthic deposit feeders and toxic dinoflagellates; Controls of harmful macroalgal blooms:experimental and comparative studies; Toxin composition variability as an indicator of nutritional status of *Alexandrium* field populations; A molecular basis for differential susceptibility and accumulation of PSP toxins in commercial bivalves; Ecological and evolutionary consequences of the spreading of *Alexandrium* to grazers, and implications for bloom formation and maintenance; The role of zooplankton grazers in harmful algal bloom dynamics; Diarrhetic toxins and *Prorocentrum lima* in New England coastal waters. For a complete description of these projects please contact the Center for Sponsored Coastal Ocean Research.

Impact of Transport Processes on Lobster Fishery Patterns - This project was funded in 2002-2003, and will provide a quantitative, mechanistic model of lobster recruitment, from egg production to the fishery, in the northern and western Gulf of Maine. It will map egg production patterns, calculate dispersal patterns using 3-D physical circulation models coupled to realistic biological behavioral models, determine settlement patterns under different flow regimes, and estimate the effects of transport processes and settlement patterns on fishery production.

Climate-Based Forecasts of the Gulf of Maine Ecosystem - A chain of interactions link the Gulf of Maine ecosystem to North Atlantic climate forcing. This project began in 2002, and will refine understanding of the interconnections among North Atlantic climate, water mass transport, zooplankton populations, and fish recruitment. Results will be incorporated into stock assessment models and help extend these projections farther into the future. The management implications of a related model for right whale reproduction will also be considered.

Gulf of Maine Accomplishments and Activities Supported by the National Ocean Service Office of Response and Restoration and the National Marine Fisheries Service Restoration Center

Gulf of Maine Restoration Web Site Portal: The NOAA Restoration Program is assisting the Gulf of Maine Council in the development of a regional Web portal that describes coastal habitat restoration projects in the Gulf of Maine region. The new site will include a project inventory containing nformation on acreage restored by habitat type, restoration techniques, and monitoring. The Gulf of Maine project inventory will be constructed as a subset of NOAA's National Estuary Restoration Inventory (NERI), which went on-line in February 2004 (http://neri.noaa.gov). The Council is taking the lead on data collection for appropriate projects, and maintains special administrative access to Gulf of Maine projects contained in the national inventory, for project monitoring and approval purposes. As a part of NERI, the Gulf of Maine project inventory will benefit from several advanced features, including query capability, generation of project profiles, posting of project photographs, visualization and analysis tools, and interactive Web mapping.

Below is a link that tells of one more NOAA accomplishment in the GoM. It's a Local Fisheries Knowledge Project in Maine that's recording and archiving information about local fisheries through interviews with fishermen, done by local school groups.

http://www.ruraledu.org/roots/rr406a.htm.

Students Collect and Disseminate Local Knowledge of Maine Fisheries*By Elisabeth Higgins Null* For tourists and natives alike, the hardworking fisherman symbolizes much that is admired and cherished in Maine's coastal communities, but often his survival has been taken for granted. The students of Ellsworth and Jonesport-Beals High Schools plan to change that as they help launch a new project to document the lore and wisdom of their local fishing communities. **Gathering Fish Tales and Fish Data** Funded by NOAA (National Oceanic and Atmospheric Administration) Fisheries and implemented in partnership with the Rural School and Community Trust, the Local Fisheries Knowledge Project will result in student-generated publications, presentations, and local events. But the students will also be contributing to a larger, cumulative research effort. Using digital equipment, the students will transcribe, classify, abstract, and enter the information they collect through their interviews with local residents into an online database designed by NOAA Fisheries for both scientific research and public use. Susan Abbott-Jamieson, senior social scientist at NOAA Fisheries, developed the idea after realizing that _fishermen felt NOAA did not listen to what [they] knew about fisheries and their local marine environment._ A

former chair of the anthropology department at the University of Kentucky, she was well aware of how students in Georgia had previously documented the traditional culture of their Appalachian communities in the Foxfire project. Tapping into NOAA's support for programs introducing young people to fisheries science and management, Abbott-Jamieson turned to the Rural Trust for help in locating Maine coastal schools where students could conduct fisheries research among friends and neighbors. If the project proves successful in encouraging collaboration between fishermen and scientists, it may in time serve as a model for other fishing communities to emulate.

The first step is making the information accessible to all, and NOAA Fisheries' Jennifer Isé has developed a database flexible enough to be used both by professional researchers seeking hard facts and qualitative information and also by students and the general public trying to learn more about the history, customs, and quality of life in each fishing community. Fish tales, local customs, and reminiscences about boat building will be entered into the database alongside information about species, catch-rates, and habitat. As the database grows, Isé envisions teachers posting some of the curricular materials they have developed while guiding young people through their place-based fieldwork. **Fisheries: Diving Deep into the Curriculum** The students at Jonesport-Beals High School are enthusiastic about participating in the Local Fisheries Knowledge Project. Brittany Sawyer, for instance, sees the project as _a chance to go out in our community and talk to those who are part of the widespread fish industry and see how things have changed and are changing._ Misty Blount welcomes the opportunity _to do something we didn't think we could do._ Classes across the school will be involved in a multitude of tasks related to the program. Students in Pam Smith's _Entrepreneurship: We Mean Business__ class will develop an illustrated booklet of anecdotes, recipes, photographs, and nostalgia quizzes titled _Moosabec Legends and Lore._ They are cooperating closely with students in Linda Church's business class, who are learning to use Cool Edit 2000 software in preparation for transcribing a large number of recorded interviews for the database. Smith and Church's classes are already seeking out interview subjects. Together they carried a dozen cassette tapes of interviews with area fishermen-conducted during the 1960s by local historian Alton Norton, Jr.-to Eastport to consult with Shead High School specialists about their digital preservation. While there, they also visited the Tides Institute to learn more about the importance of preserving oral history, as well as specific interviewing techniques. Jim Roberts, curriculum developer for Maine's Washington County Consortium and a member of the Rural Trust's Rural Faculty, coordinates the Local Fisheries Knowledge Project at both Jonesport-Beals and Ellsworth High Schools. He believes the projet presents many ways to engage students across the curriculum, and sees the project as adding practical dimensions to the commitment of Jonesport-Beals' teachers in every content area to improve _strategic literacy._ The processes of interviewing, describing, classifying, and categorizing collected information for the database will improve skills in listening, summarizing, and abstracting. These are the same skills teachers stress as part of another partnership the Consortium has, this one with the Northeast and Islands Regional Educational Laboratory at Brown University (LAB) geared toward improving literacy at the secondary level.

Other teachers in the school are planning ways to be involved in the project. Art teacher Lisa Marin intends to have her students study the area's folk and traditional art forms. The industrial arts teacher, Arnie Smith, would like his students to explore weir fishing, purse seining, and the all-but-forgotten skills of knitting trap heads and bait bags. Math and science teachers have been looking at several potential ways to connect the project to their curriculum. Math topics might include exploring geographical positioning systems, mapping and statistics. Science classes will investigate topics such as lobster die-offs, climate change, and the lunar cycle's effect on tides and fishing. **Enhancing Students' Involvement with the Sea** Roberts himself is enthusiastically plotting the ways concepts and skills associated with the project can be aligned with the Maine Standards of Learning. Although some of the curricular plans he and the teachers have devised are more central to the project than others, many will focus on one main question agreed upon by Jonesport-Beals High School faculty: _What is our place in the changing face of Jonesport-Beals' marine culture?_ This is the very question students are most likely to ask of themselves as they ponder their future at the beginning of the 21st century. Unlike most fishing communities, times are good right now for Jonesport and nearby Beals Island because of their specialization in lobsters. While lobstermen in the southern New England states lament a diseased and dwindling stock, local lobstermen have been experiencing ample catches over the last few years. About a third of the 104 students at Jonesport-Beals High School have commercial fishing licenses, and many of them have already purchased their own boats. At an opening address this fall, Roberts told the students that they had been invited to participate in the Local Fisheries Knowledge Project because of their embrace of the work ethic—indeed, many students already labor long hours on the water or provide support services for family members who do so. Under such circumstances, deciding whether or not to finish high school or attend college is not a matter of motivation and aptitude, but one of priority for local teenagers.

Photo by Jennifer Isé, NOAA FisheriesThe Beals-Jonesport Co-Op Inc. distributes lobsters caught locally to broader regional and national markets.

These days, older folks in town see the Local Fisheries Knowledge Project as a means of enhancing rather than competing with their children's involvement with the sea. They hope their young people can use education to get a broader picture of the fisheries, to assume scientific and research positions, and to develop other skills that can keep them working when fish are in short supply. Community support of the project has increased as lobstermen and their families, protective of territory and trade secrets, realize they will be asked only to share what they choose to divulge. Some view the NOAA database as a small, but important step in bridging the gulf between traditional and academic fisheries knowledge: their practical advice and experience is being respected as a means of sustaining the fisheries while still making use of them. They also see it as a chance to archive and preserve that same information for future generations. **The _Cod Squad_ Tackles Fisheries** Teachers and students at Ellsworth High School have decided to ask a

different question from the focus of Jonesport-Beals: _What does the fishing industry have to do with Ellsworth High School's communities?_ Ellsworth itself is a bustling commercial town of about 6,500 residents compared to Jonesport's population of 1,500. A retail and service center not only for _downeast_ Maine, but also for the thousands of tourists who stream in and out of Acadia National Park, it has an economic history as a nineteenth-century center for sawmills and shipbuilding. Today, the school-like the community-serves an economically diverse population; 40 to 50 percent of the 600 high school students during any particular year enroll from outlying communities. Many of the villages they return to at night depend on fishing for their year-round economic vitality. As this project commences, teachers and high school students are realizing that almost everyone they know has a family member or neighbor who fishes for a living. Beyond this direct involvement in fishing, Ellsworth has worm diggers and other commercial providers of bait. It has banks that provide credit to those purchasing new boats and equipment for the fisheries. It also has tackle shops, fresh seafood restaurants, and an important seafood distribution business, Maine Shellfish. Because of Ellsworth High School's size and the far-flung nature of its student population, working the Local Fisheries Knowledge Project into the curriculum is a carefully organized enterprise. With its small size, teachers in grades 9B12 at Jonesport-Beals High School can easily integrate aspects of database collection and analysis into their other course work as topics suggest themselves, and can drive students around to sites of interest with little advance planning. At Ellsworth High, the program is organized by a core group of teachers who call themselves _the Cod Squad,_ whose reach extends only to the 175 members of the sophomore class.

The data collection is shared among many classes at Ellsworth, so each component must be tightly organized in order for the project to flow smoothly without time lags and backlogs. One advantage of its size is that Ellsworth has the resources and specialists of larger schools-the technology specialist, Grey Maxim, works not only with Ellsworth students and their teachers to master the project's digital technology, but extended his help to Jonesport-Beals High School as well. All sophomores take a core course in world history and plan to look at fishing in a broad perspective using Mark Kurlansky's *Cod: A Biography of the Fish That Changed the World* as one of their central texts. The Ellsworth Public Library has also selected the book for the larger community to read at about the same time as the students. Students and faculty are hoping to invite Kurlansky himself to come to the area for a reading and discussion. Ellsworth science students have helped divide the entire sophomore class into smaller teams for carrying out the fieldwork process and interviews, by first administering questionnaires and then developing the groups matched for interests and skills. In addition to work specifically related to the database, each of these teams will develop a project of their own choosing based on the interviews, like an exhibit or a play. Joyce Whitmore, chair of the social studies department, believes it is important for the students to share what they have learned from the community, and views creative student-generated responses to the collected information, artifacts, and experiences as a gift. **Student Work-Shaping the Future** During this early phase of the project, the teachers have been in

regular touch with area scholars including James Acheson, an anthropologist at the University of Maine at Orono whose book, *The Lobster Gangs of Maine*, paved the way for the sort of in-depth community studies of fishing life envisioned by Abbott-Jamieson and Isé of NOAA. Students from both schools will have the opportunity to read his book. This will give students from fishing communities the rare chance to critique a professional researcher from the point of view of the studied group. Michael Kimball from the University of Maine at Machias has invited Jonesport-Beals students to make a presentation for one of his undergraduate anthropology classes. Ted Ames, an experienced Maine groundfisherman and historian has also been advising the project. One hoped-for result of this wide support is that students will see themselves as part of a larger team of men and women trying to keep the fisheries vital for future generations. Julie Bartsch, Rural Trust Steward in the Northeast, is enthusiastic not only about the project's potential but also about the effort to bring the schools into broader contact with local and regional resources. _When students work on issues that are of real importance to the community, and community members get involved as resources, everyone benefits,_ she says. Thinking about the project on a practical level, Bartsch describes the Local Fisheries Knowledge Project as _an excellent example of 'place-based' learning._ The idea that, in so doing, students may be shaping the processes of change, preservation, and conservation of the fisheries is perhaps the greatest educational benefit of all. **Visit the Resource Center for this article**

Elizabeth Mills
National Policy and Evaluation Division
Office of Ocean and Coastal Resource Management

NOAA's National Ocean Service
1305 East West Highway, SSMC4
Silver Spring, Maryland 20910
Phone: (301) 713-3155 ext. 201
Fax: (301) 713-4012
E-Mail: elizabeth.mills@noaa.gov

The Global Programme of Action Coalition for the Gulf of Maine (GPAC) from 1996-2004

Current Canadian co-chair: Joseph Arbour, PhD, Department of Fisheries of Oceans,
Current American co-chair: Pamela W. Person, Coalition for Sensible Energy, Maine

GPAC was established in 1996 as one of two pilot projects of the Commission on Environmental Cooperation, as the three nations response to how to implement the international Global Program of Action to Protect the Marine Environment from Land-Based Activities (GPA). The GPA was adopted by 106 nations in 1995, as nations realized that 80% of the threats to the marine environment come from land-based activities. The United Nations Environment Program in The Hague, Netherlands administers the GPA.

GPAC is a collaborative, bi-national, cross-sectoral organization dedicated to the implementation of the GPA. Primarily volunteer based, the GPAC has worked to develop consensus on priority land-based activities that are contributing to the habitats in this critical ecosystem, and to take action, or encourage others to take action, to curb their impacts. The GPAC was established with approximately 40 members. Task groups, chaired by a GPAC member, but open to others were created to complete actions. Using consultations, workshops, public meetings and forums, GPAC has reached many hundred citizens, resource managers and resource users in the Gulf of Maine since it first meeting in the Summer of 1997

At the First GPA Inter governmental Review Meeting in Montreal in November 2001 we were pleased to hear GPACs work in the Gulf of Maine praised as the best implementation of the GPA in the world.

GPAC has completed the GPA methodology:

1) Identification and assessment of problems. Consensus on fifteen priority environmental issues common throughout the Gulf of Maine. (Workshop in Saint John NB, 27-29 April 1998). Two detailed scoping papers prepared in advance.
2) Establishment of management priorities (Workshop in Portland, Maine 15-17 November, 1998) with five scoping papers prepared in advance.

3)_Setting management objectives (GPAC meetings in 1999)

\4) Identification, evaluation and selection of strategies and measures through five pilot projects in response to the chosen management strategies. (GPAC Task Groups completed projects from 1999-2002)

- Writing, publication and distribution of the *50 Ways to Save the Gulf of Maine* booklet and

brochure in 2001 through present.

•June 1999 workshop on coastal wetland restoration to develop uniform regional protocols has led to funded position for coastal wetland protection regional coordinator.
•1999 Workshop held to start to determine effects of low-tropic harvesting. Have had additional meetings
• to plan for regional marine research.
•2000 workshop held to assess governmental structures in the Gulf of Maine to
• see if they were providing enough oversight. The 16-year-old bi-national Gulf of Maine Council on the Marine Environment is helping GPAC implement its chosen management objectives – including the Forum/Summit project described below.
•Funded an updating of the non-governmental organizational directory for the Gulf of Maine.
5) Awareness building. In May 2001, GPAC adopted as its current project the From the Bottom Up State of the Gulf of Maine Regional Watershed Forums and Summit Project (May 2001-October 2004). Forums have been held in every jurisdiction, leading to greater awareness of Gulf of Maine watershed priority environmental issues. The knowledge sharing from citizens, businesses and resource users to and from the scientists and agency managers, we believe has been extremely valuable to both the "top and bottom."

Even after the pilot project ended in 2000, the group decided to continue working as the land-based threats"remain in the Gulf of Maine region. We have had funding (cash and in-kind) from NOAA, DFO and EC as well as many state and provincial governments to help complete the Regional Watershed Forums project. Current funding for Forum final reports and Summit preparation comes from the Gulf of Maine Association.

List of forums held, dates and convening organizations: (See separate Summary report giving summaries of each forum.)

Gulf of Maine US – November 2002, MERI
– 3 in 2003 and 1 in 2004, MA CZM
New Hampshire - October 2003, NHEP
Maine – Penobscot Bay, Feb 2003, PBNetwork
Blue Hill to Taunton Bay, 11/02, GPAC and local planning committee
Hancock County Youth, 11/02, MDIWQC
Washington County, 1/03, SHARE
Gulf of Maine – Canada – May 2002, BOFEP
New Brunswick – St. Croix Estuary – 3/03, SCEP
Lower Saint John River 2/03 - ACAP SJ
Saint John River & Harbour – 3/03 -ACAP SJ
Eastern Charlotte County – 3/03 CCNB

New Brunswick-Nova Scotia –
Chinetco-Shepody-Cumberland watersheds –Pedicodiac
Riverkeepers(?) March 2003(?)
Nova Scotia – Minas Basin – 3 workshops Winter 2002, BOFEP
St. Mary's Bay – 12/03 – Bay of Fundy Marine Resource Center, 2-3/03

Organization: **U.S. Army Corps of Engineers**

Address: 696 Virginia Road

City, State/Province: Concord, MA

Zip/Postal code: 01742

Submitted by: Cathy Rogers on Tuesday, May 11, 2004 at 15:36:43

Achievement_1: Habitat

Achievement_1-Description: Smelt Hill Dam, Falmouth, ME: Removed Smelt Hill Dam on the Presumpscot River to restore 7 river miles for anadromous fish (alewife and blueback herring) passage.

Achievement_2: Habitat

Achievement 2: Sagamore Marsh, Sagamore, MA: Restore approximately 50 acres of degraded salt marsh by increasing tidal flow.

Achievement_3: Contaminants

Achievement 3: Boston Harbor, MA: As part of the Boston Harbor Navigation Improvement Project, 1 million cy of silty material unsuitable for ocean water disposal (contaminated) was disposed in capped Confined Aquatic Disposal (CAD) cells. This removed the material from exposure to biological resources.

Current project 1: Broad Meadows Marsh, Quincy, MA: Study to recommend restoring 38 acres of a degraded salt marsh by removing dredged material from a previously used disposal site. This will restore tidal flow and create high and low salt marsh.

Current project 2: Half Moon Cove, Easport, ME: Study to review increasing tidal flow to Half Moon Cove from Passamaquoddy Bay.

Current project 3: Sandy River, Norridgewock, ME: Study to evaluate restoring up to 100 river miles, in combination with other restoration projects, by removing Madison Dam to allow anadromous fish (salmon, shad, and herring) passage.

GOM Summit Survey: Submit Completed Survey

US Fish and Wildlife

Gulf of Maine Coastal Program: building partnerships to protect nationally important fish and wildlife habitat in the Gulf of Maine watershed.

The Gulf of Maine Coastal Program, established in 1991 as part of a nationwide network of U.S. Fish and Wildlife Service Coastal Program offices, focuses on protecting economically, recreationally, and ecologically important coastal fish and wildlife habitat through partnerships. Using existing scientific data along with biological expertise and state-of-the-art computer mapping and database management capabilities, Gulf of Maine Program biologists analyze data, identify and map important fish and wildlife habitat, and recommend and implement habitat protection and restoration measures. By sharing biological information, offering technical assistance and identifying funding opportunities, Gulf of Maine Program works with interested parties -- federal and state agencies, town officials, statewide conservation groups, local land trusts and watershed associations, angling clubs, industry representatives and willing landowners -- to protect the tremendous coastal fish and wildlife resources in the Gulf of Maine watershed.

Working in voluntary non-regulatory partnerships, the Gulf of Maine Coastal Program has played a key role in:
permanently protecting more than 69,000 acres of high value fish and wildlife habitat through fee and easement acquisition -- including 44 nesting islands, 100 coastal wetlands and associated upland buffer sites and 42 areas with habitat adjacent to searun fish rivers,
protecting fish and wildlife habitat on the largest forest land easement in the United States -- a 762,202 acre no-development easement,

restoring more than 4,500 acres of habitat for migratory birds
--
including 65 coastal wetlands, 4 grasslands, and 13 nesting islands,
completing 56 river restoration projects to benefit searun fish
--
including the removal of 10 dams on rivers and the installation
or
repair of 12 fish passage facilities at existing dams, and
leveraging more than $92 million worth of habitat protection and restoration funding.

The Gulf of Maine Coastal Program's habitat protection and restoration initiatives depend on funding and technical support from the U.S. Fish and Wildlife Service, as well as many other state and federal agencies, non-governmental conservation groups, local land trusts and watershed associations, angling groups, landowners and nearby residents. Key national and state partners include other U.S. Fish and Wildlife Service offices in Maine, the National Fish and Wildlife Foundation, Natural Resources Conservation Service, National Marine Fisheries Service, Maine Dept. of Inland Fisheries and Wildlife, Maine Dept. of Marine Resources, Maine Dept. of Environmental Protection, Maine State Planning Office, Maine Atlantic Salmon Commission, Casco Bay National Estuary Project, Maine Coast Heritage Trust, The Nature Conservancy -- Maine Chapter, The Trust for Public Lands, American Rivers, Atlantic Salmon Federation -- Maine Council, Ducks Unlimited, Inc. and Trout Unlimited.

For further information please contact:

U.S. Fish and Wildlife Service

Gulf of Maine Coastal Program
4R Fundy Road, Falmouth, Maine 04105
Phone: (207) 781-8364
FAX: (207) 781-8369
E-mail: FW5ES_GOMP@fws.gov
http://gulfofmaine.fws.gov
Project Leader, Stewart Fefer

==========

Stewart Fefer, Project Leader
USFWS, Gulf of Maine Program
4R Fundy Rd., Falmouth, ME 04105
Phone: 207-781-8364; Fax: 207-781-8369
Email: stewart_fefer@fws.gov
Website: http://gulfofmaine.fws.gov

Organization: **US Geological Survey**

Address: 361 Commerce Way

City, State/Province: Pembroke, NH

Zip/Postal code: 03275

Submitted by: Keith Robinson (kwrobins@usgs.gov) on Wednesday, June 09, 2004 at 05:54:30

Achievement_1: Other

Achievement_1-Other_category: Resource Assessments and Understanding

Achievement_1-Description: USGS recently completed the New England SPARROW Model for nitrogen and phosphorus. This model evaluates relations between watershed features and loads of nutrients in rivers and then uses these relations to predict nutrient load in unmonitored waters. The New England SPARROW model makes predictions for 42,000 stream reaches in New England. Significant predictors of nutrient loads are defined. The report is available online at: http://water.usgs.gov/pubs/sir/2004/5012/

Achievement_2: Other

Achievement_2-Other_category: Resource Assessments and Understanding

Achievement 2: The USGS National Water-Quality Assessment Program (NAWQA) has recently completed an intensive study of surface and ground waters in the New England Coastal Basins study area. This study area includes coastal drainges from the Kennebec River in Maine to Narragansetts Bay in Rhode Island. A final report on the study and data associated with it are available on-line at: http://nh.water.usgs.gov/CurrentProjects/nawqa/nawqaweb.htm

GOM Summit Survey: Submit Completed Survey

Organization: **U.S. Geological Survey**

Address: 384 Woods Hole Road

City, State/Province: Woods Hole, MA

Zip/Postal code: 02543-1598

Submitted by: Bradford Butman (bbutman@usgs.gov) on Tuesday, June 01, 2004 at 14:05:54

Achievement_1: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement_1-Description: USGS National Geologic Studies of Benthic Habitats, Northeastern United States: Stellwagen Bank National Marine Sanctuary Region off Boston, Massachusetts

The Stellwagen Bank National Marine Sanctuary region is heavily utilized by humans and by marine species. It is a rich commercial and recreational fishing ground. It provides essential habitat for many species of marine mammals, including the endangered North Atlantic Right Whale; and it is the focus of a large tourism industry centered on whale watching. The sanctuary abuts the Massachusetts Bay Disposal Site, which serves as a repository for material dredged from the harbors of Boston and nearby cities; and it lies seaward of Boston's new ocean outfall that discharges treated sewage effluent into Massachusetts Bay. The sanctuary lies in the major shipping lane to and from Boston Harbor; and recently its seabed has been traversed by a fiber optics communications cable that connects New England with Nova Scotia and Europe.

The sea floor mapping survey of the Stellwagen Bank National Marine Sanctuary region covers approximately 1100 square nautical miles of seabed located off Boston, Massachusetts and extending from Race Point Channel (just north of Cape Cod) to the southern part of Jeffreys Ledge (north of Cape Ann). It was conducted on four cruises over a two-year period from the fall of 1994 to the fall of 1996 using a multibeam echo sounder installed aboard the Canadian Hydrographic Service vessel Frederick G. Creed.

The sedimentary environments and biological habitats found on the sea floor are being identified and interpreted by using video

and photographic imagery and sediment samples that have been collected on many cruises to the region since the mapping was initiated. Research results and products are presented in the form of maps, posters, fact sheets, sonar images, and bottom photographs.

For more information, see: http://woodshole.er.usgs.gov/project-pages/stellwagen/stellwagenbank.html

Achievement_2: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 2: National Assessment of Coastal Vulnerability to Sea-Level Rise: Preliminary Results for the U.S. Atlantic Coast

One of the most important applied problems in coastal geology today is determining the physical response of the coastline to sea-level rise. Prediction of shoreline retreat and land loss rates is critical to the planning of future coastal zone management strategies, and assessing biological impacts due to habitat changes or destruction. Presently, long-term (>50 years) coastal planning and decision-making has been done piecemeal, if at all, for the nation's shoreline. Consequently, facilities are being located and entire communities are being developed without adequate consideration of the potential costs of protecting or relocating them from sea level rise-related erosion, flooding and storm damage.

For more information, see: http://pubs.usgs.gov/of/of99-593/

Achievement_3: Habitat Maritime activities Awareness Stewardship

Achievement 3: Marine Invasive Species
Didemnum lahillei, a colonial tunicate; ascidian; sea squirt

Didemnum lahillei is a marine colonial tunicate (ascidian; sea squirt) that has been observed at several locations in the northeast Pacific and North Atlantic Ocean basins. It exhibits the characteristics of an invasive species: 1) sudden occurrence where not before known; 2) rapid reproduction and excessive biomass; 3) no known predators. It is native to Europe. The rapid spread of Didemnum lahillei alters marine habitats and threatens to interfere with fishing, aquaculture, and other coastal and offshore activities. It is found on hard substrates that include dock structures and floats, wood and metal pilings, moorings and ropes, steel chain, automobile tires, polythene plastic, rock outcrops,

gravel seabed (pebbles, cobbles, boulders), and ship hulls. It overgrows organisms such as tunicates, sponges, macroalgae, hydroids, anemones, bryozoans, scallops, mussels, and oysters. Where D. lahillei occurs on the seabed, it likely covers the siphons of infaunal bivalves. D. lahillei has been reported from coastal areas in California, New England, northwest France, and the Netherlands. It also has been observed on the continental shelf off New England in the Gulf of Maine region. It has been found at water depths ranging from intertidal to continental shelf depths of 48m (157 ft).

The goal of this website is to assemble and communicate information on the distribution, biology, and marine habitat impacts of the highly invasive colonial tunicate Didemnum lahillei. Researchers and others are encouraged to share published and preliminary research results and anecdotal observations on these topics. All contributions are acknowledged. The information displayed on this website is in the public domain. Users are expected to give proper credit for images, data, and ideas they incorporate into their work.

For more information, see:
http://woodshole.er.usgs.gov/project-pages/stellwagen/didemnum/

Achievement_4: Habitat Maritime activities Awareness Stewardship

Achievement 4: Coastal Vulnerability Assessment of Cape Cod National Seashore to Sea-Level Rise

A coastal vulnerability index (CVI) was used to map the relative vulnerability of the coast to future sea-level rise within the Cape Cod National Seashore (CACO). The CVI ranks the following in terms of their physical contribution to sea-level rise-related coastal change: geomorphology, regional coastal slope, rate of relative sea-level rise, shoreline change rates, mean tidal range and mean wave height. The rankings for each variable were combined and an index value calculated for 1-minute grid cells covering the park. The CVI highlights those regions where the physical effects of sea-level rise might be the greatest. This approach combines the coastal system's susceptibility to change with its natural ability to adapt to changing environmental conditions, yielding a quantitative, although relative, measure of the park's natural vulnerability to the effects of sea-level rise. CACO consists of high glacial cliffs, beaches, sand spits, and salt marsh wetlands. The areas most vulnerable to sea-level rise are those with the lowest regional coastal slopes, geomorphologic types that are susceptible to inundation, and the highest rates of shoreline change. Most of CACO's infrastructure lies on high elevation uplands away from the shore; most high use areas are accessible by foot

only. The CVI provides an objective technique for evaluation and long-term planning by scientists and park managers.

For more information, see:
http://pubs.usgs.gov/of/2002/of02-233/index.html

GOM Summit Survey: Submit Completed Survey

Organization: **U.S. Geological Survey**

Address: 384 Woods Hole Road

City, State/Province: Woods Hole, Massachusetts

Zip/Postal code: 02543-1598

Submitted by: Bradford Butman (bbutman@usgs.gov) on Tuesday, June 01, 2004 at 13:46:39

Achievement_1: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement_1-Description: Predicting Contaminant Transport and Fate in Massachusetts Bay

Since 1989, the United States Geological Survey (USGS), in cooperation with the Massachusetts Water REsources Authroity (MWRA), has been conducting research to understand and predict the fate of contaminants introduced to Massachusetts` coastal waters. The overall objective is to develop a capability to predict the fate of contaminants associated with fine-grained sediments on a regional basis. We emphasize sediments because most contaminants introduced to the ocean are adsorbed by and transported with suspended sediments. After complicated cycles of deposition, resuspension, and biological and chemical interactions, contaminants on particles may be eventually buried in bottom sediments, which become the ultimate contaminant sink. The project includes mapping of the sea floor, modeling, monitoring, and distribution of information.

For more information, see http://woodshole.er.usgs.gov/project-pages/bostonharbor/

Achievement_2: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 2: High-resolution geologic mapping of the sea floor offshore of Massachusetts.

The U.S. Geological Survey, in cooperation with the National Oceanic and Atmospheric Administration (NOAA), the Massachusetts Office of Coastal Zone Management (CZM), the University of New Brunswick, the University of New Hampshire, and the Canadian Hydrographic Service is conducting geologic mapping of the sea floor to characterize the surface and subsurface geologic framework offshore of Massachusetts. The long-term goal of this mapping effort is to produce high-resolution

geologic maps and a Geographic Information System (GIS) that will serve the needs of research, management and the public. Geologic mapping has been completed in the Stellwagen Bank National Marine Sanctuary and western Massachusetts Bay. Mapping is presently focused in three areas north of Cape Cod that compliment these maps, and includes new data acquisition using a variety of survey systems as well as reprocessing of existing data. The website provides a brief description of the mapping projects, links to maps available over the World Wide Web and a list of paper maps and maps available on CD-ROM.

For more information, see:
http://woodshole.er.usgs.gov/project-pages/coastal_mass/

Achievement_3: Habitat Contaminants Maritime activities Awareness

Achievement 3: Gulf of Maine Contaminated Sediments Data Base

Bottom sediments in the Gulf of Maine and its estuaries have accumulated pollutants of many types, including metals and organic compounds of agricultural, industrial, and household derivation. Much analytical and descriptive data has been obtained on these sediments over the past decades, but only a small effort had been made, prior to this project, to compile and edit the published and unpublished data in forms suitable for a variety of users. The Contaminated Sediments Database for the Gulf of Maine provides a compilation and synthesis of existing data to help establish the environmental status of our coastal sediments and the transport paths and fate of contaminants in this region. This information, in turn, forms one of the essential bases for developing successful remediation and resource management policies.

This product is the result of a collaborative effort of principal investigators from the U.S. Geological Survey Coastal and Marine Geology Program (USGS), Woods Hole Oceanographic Institution (WHOI), the University of New Hampshire (UNH), Bigelow Laboratory for Ocean Sciences, the 5University of Massachusetts (UMASS), and active participation from the U.S. Army Corps of Engineers (USACOE), the U.S. Environmental Protection Agency (USEPA), the Massachusetts Water Resources Authority (MWRA), the National Oceanic and Atmospheric Administration (NOAA), and other federal and state agencies. Funding was provided by participating institutions and the Gulf of Maine Regional Marine Research Program.

For more information, see:
http://pubs.usgs.gov/of/2002/of02-403/

Achievement_4: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 4: Surficial Sediment Data from the Gulf of Maine, Georges Bank, and Vicinity: A GIS Compilation

The U.S. Geological Survey, in cooperation with the University of Maine, University of New Hampshire, Boston University, and Bigelow Laboratory for Ocean Sciences, has compiled surficial sediment data on the sea floor from off the northeastern U.S. These data, which are presented herein and contain information on sediment grain size and lithology for over 47,000 stations, were compiled as part of the U.S. Geological Survey's National Benthic Habitats and Marine Aggregate Resources and Processes Projects to update the existent maps on surficial sediment distribution available for this region. The National Benthic Habitats Project addresses societal needs by studying the interplay of geologic factors and species behavior that gives rise to biologic habitats in general and to the specific habitats deemed essential to the success of particular species. The principal objective of the Marine Aggregate Resources and Processes Project is to produce a series of new geologic maps and reports for regions such as the Gulf of Maine that will provide scientific insights into the character and geologic development of U.S. continental margins and assess the availability of offshore resources. These maps and assessments are being done on a national scale using usSEABED (Williams and others, 2003), and the sediment data compiled as part of this report will be imported into the usSEABED data-mining software system. Potential uses for these data include: (1) defining the geological variability of the sea floor, one of the primary controls of benthic habitat diversity; (2) improving our understanding of the processes that control the distribution and transport of bottom sediments, benthic habitats, and associated infaunal community structures; (3) locating aggregate resources for beach nourishment and industrial applications; and (4) providing a detailed framework for future research, monitoring, and management activities. Because the present distribution of surficial sediment off the northeastern United States is shaped from the deposits left by the last glaciation and reflects the cumulative effects of sediment erosion, transport, sorting, and deposition by storm and tidal currents during and since the Holocene eustatic rise in sea level, these sediments also represent both a historical record of former conditions and a guide to possible future sedimentary environments.

For more information, see:
http://pubs.usgs.gov/of/2003/of03-001/index.htm

Achievement_5: Habitat Contaminants Maritime activities Awareness Stewardship

Achievement 5: Construction of Digital Bathymetry for the Gulf of Maine

A system-wide description of the seafloor topography is a basic requirement for most coastal oceanographic studies. The necessary detail of the topography obviously varies with application, but for many uses, a nominal resolution of 0.5 or 1 km is appropriate. Creating a digital bathymetric grid with this level of resolution can be a complex procedure due to a multiplicity of data sources, data coverage's, datum's and interpolation procedures. The objective here was to construct a 15 arc second (~0.5 km) and 30 arc second (~1.0 km) bathymetric grids for the Gulf of Maine (Longitude = 71.5 - 63 W, Latitude = 39.5 - 46 N). In addition to the grids themselves, valuable ancillary products such as sounding data with obvious bad points removed, digital bathymetric contour lines and shaded-relief maps were generated.

The first step in compiling a composite bathymetric dataset was to find all available digital hydrographic data for the Gulf of Maine region. Given the variety of input data, the specific characteristics of each dataset had be taken into account before incorporation into the composite dataset. These characteristics included the method of collection, survey resolution (sampling frequency), method and units of navigational positioning, horizontal and vertical datum, and tidal parameters used for corrections. Taking all these factors into account required specific data processing, hardware and software strategies.

For more information, see:
http://pubs.usgs.gov/of/of98-801/bathy/index.htm

GOM Summit Survey: Submit Completed Survey
