



Gulf of Maine
Council on the
Marine Environment

ACTION PLAN

2012–2017



Slade Moore and John Sowles

GOAL 1: RESTORED AND CONSERVED HABITATS



Waterview Consulting

GOAL 2: ENVIRONMENTAL AND HUMAN HEALTH



Waterview Consulting

GOAL 3: SUSTAINABLE COMMUNITIES



Preface

THE GULF OF MAINE, INCLUDING THE BAY OF FUNDY, IS A WORLD-CLASS NATURAL WONDER that is shared by the Provinces of New Brunswick and Nova Scotia, and the States of Maine, New Hampshire, and Massachusetts. Our people rely on it for their livelihoods, for recreation, and for personal renewal.

In 1989, the region's Premiers and Governors recognized that in order to successfully address issues affecting the communities, the environment, and the economy in this bi-national watershed, we needed to work collaboratively. To that end they formed the Gulf of Maine Council on the Marine Environment, a unique Canadian-American partnership composed of government and non-government interests. For over twenty years, the provinces, states, and federal agencies from both countries have worked to encourage the development of sustainable communities, to monitor and improve environmental and human health, and to maintain and enhance the environmental quality in the Gulf of Maine for current and future generations.

Every five years, the Council renews its commitment to working together in addressing the Gulf's most pressing issues that require a unified, regional response. This is the Council's fifth action plan. This new plan outlines our collective vision of healthy marine environments and coastal habitats, and of vibrant sustainable communities that thrive under an ever-changing climate.

This year, New Brunswick is tasked with leading the Gulf of Maine Council on the Marine Environment. Therefore, on behalf of the region's Premiers and Governors, I encourage you to read this Plan and to become involved in sustaining the legacy and bounty of the Gulf of Maine.

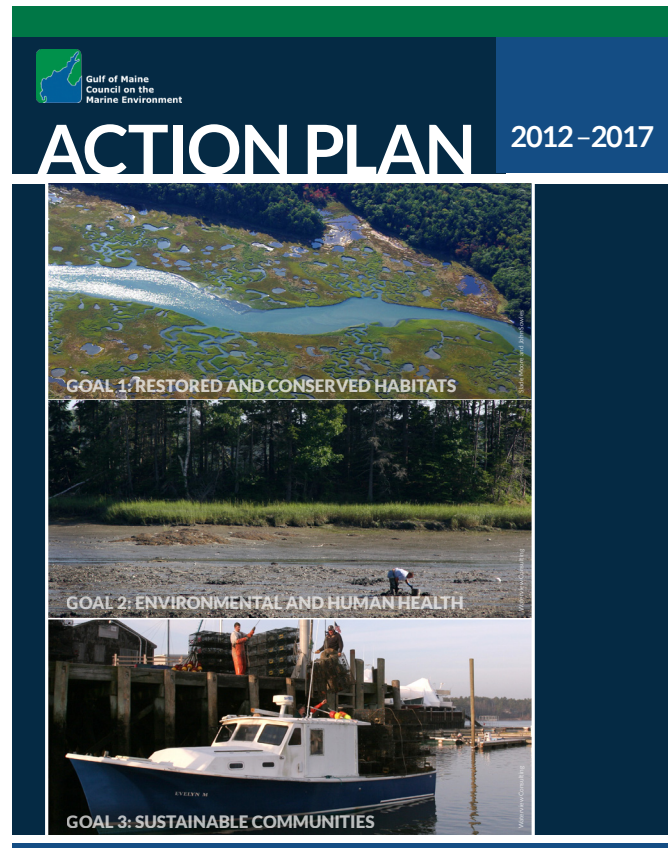


Margaret-Ann Blaney
Chair, Gulf of Maine Council on the Marine Environment (2011-2012)
Minister, Department of Environment
New Brunswick, Canada

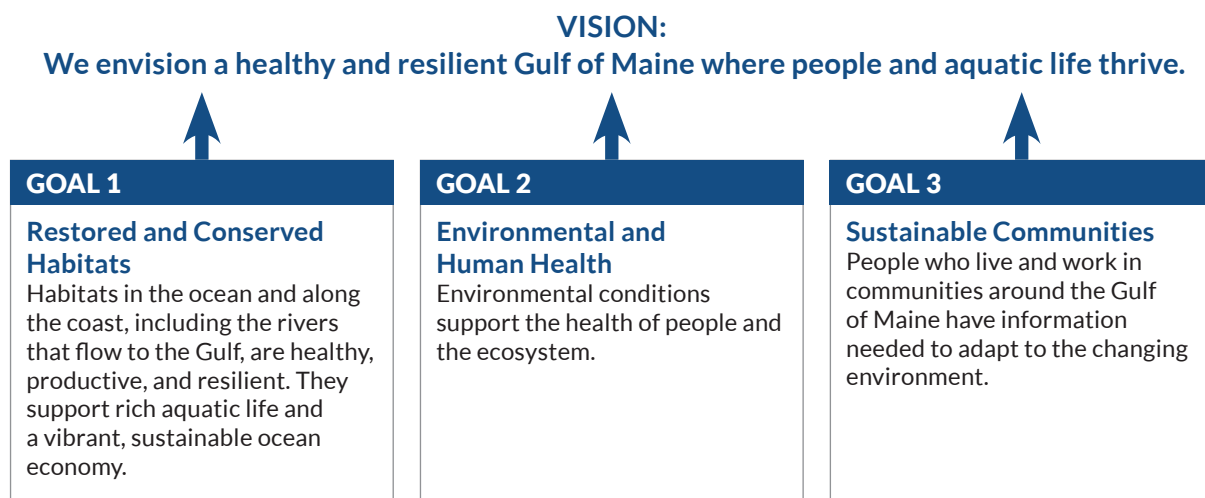
Executive Summary

THE PREMIERS OF NEW BRUNSWICK AND NOVA Scotia and the Governors of Massachusetts, Maine, and New Hampshire—the five provinces and states bordering the Gulf of Maine—established the Gulf of Maine Council on the Marine Environment in 1989 to maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations.

The *Gulf of Maine Council on the Marine Environment Action Plan 2012-2017* presents the goals, outcomes, and activities that the Council will pursue in this five-year period. Many activities will be implemented in collaboration with partner organizations. The Action Plan addresses issues that require or benefit significantly from regional collaboration and have been identified as priorities by Council members representing federal, state, and provincial governments, nongovernment organizations, and business interests.



A vision statement guides the Council's efforts. Through the 2012-2017 Action Plan, the Council is pursuing three long-range goals that contribute to the vision.



The Council is committed to these long-term goals, recognizing that it will take decades to fully realize them. For each goal, the Council identified several outcomes, which are measurable changes to be accomplished between 2012 and 2017 and that contribute toward the attainment of these goals. For each outcome, the



The Gulf of Maine plays a major role in the region's economy.



The Gulf's economic value depends on a healthy ecosystem.

Council defined one or more activities, which are projects or programs that contribute to the outcome. Work plans for implementing the activities will be posted on the Council's website at www.gulfofmaine.org/workplans.

The Council developed this Action Plan with input from partner organizations and the public. It reflects recommendations of relevant studies, reports, and workshops. It is shaped by the Council's twenty years of experience and addresses leading policy and regional priorities.

The Council anticipates that funding to implement the activities in this Action Plan will be provided by the Council (and its member Canadian and United States agencies); by nongovernment partners whose missions align with the activities and that may already be working on these activities; and through successful funding proposals to public agencies and philanthropic sources.

Action Plan Structure

The Gulf of Maine Council's 2012-2017 Action Plan includes

- a vision,
- three goals,
- two or three outcomes per goal, and
- one or more activities for each outcome.

The figure at right defines these terms and shows the relationships among them.

The **VISION** is a description of the desired future conditions.

GOAL

Goals are long-term results that the Gulf of Maine Council and other organizations are working to achieve over a period of decades and that contribute toward the vision.

OUTCOME

Outcomes are measurable changes that the Gulf of Maine Council seeks to accomplish from 2012 to 2017 and that contribute toward the goals.

ACTIVITIES OF THE GULF OF MAINE COUNCIL

Activities are projects and programs conducted by the Gulf of Maine Council to accomplish the outcomes.

GOAL 1

Restored and Conserved Habitats

Habitats in the ocean and along the coast, including the rivers that flow to the Gulf, are healthy, productive, and resilient. They support rich aquatic life and a vibrant, sustainable ocean economy.

OUTCOME 1.1

Water Quality Protection

Coastal decision-makers receive up-to-date, accurate, relevant information needed to improve and protect marine water quality for current and future generations.

ACTIVITIES OF THE GULF OF MAINE COUNCIL

1.1.1 Disseminate information about ways to improve and protect the region's marine and estuarine water quality.



Coastal habitats of the Gulf of Maine.

OUTCOME 1.2

Habitat Restoration

Habitat restoration practitioners and community-based organizations receive information, funding, and technical assistance for restoring degraded coastal ecosystems and habitats.

ACTIVITIES OF THE GULF OF MAINE COUNCIL

1.2.1 Provide Gulf of Maine habitat restoration grants and technical assistance that result in restored coastal ecosystems.

1.2.2 Facilitate the exchange of information among the region's habitat restoration practitioners.

1.2.3 Promote greater public understanding of the environmental, human health, and economic effects of restoring coastal and marine ecosystems.

OUTCOME 1.3

Habitat Conservation

Coastal decision-makers have the data and information required to conserve coastal and marine habitats in a time of intensifying human uses and a changing climate.

ACTIVITIES OF THE GULF OF MAINE COUNCIL

1.3.1 Support the region-wide exchange of information on observed and predicted effects of climate change on the people living in the region and its coastal and marine habitats.

1.3.2 Advance the bi-national acquisition and use of seafloor mapping products and services for resource and management decisions.

1.3.3 Promote the exchange of information among decision-makers about ecosystem-based approaches to managing coastal and ocean habitats.

1.3.4 Strengthen linkages between U.S. and Canadian coastal and marine spatial planning efforts.

The Need for Regional Action: Goal 1

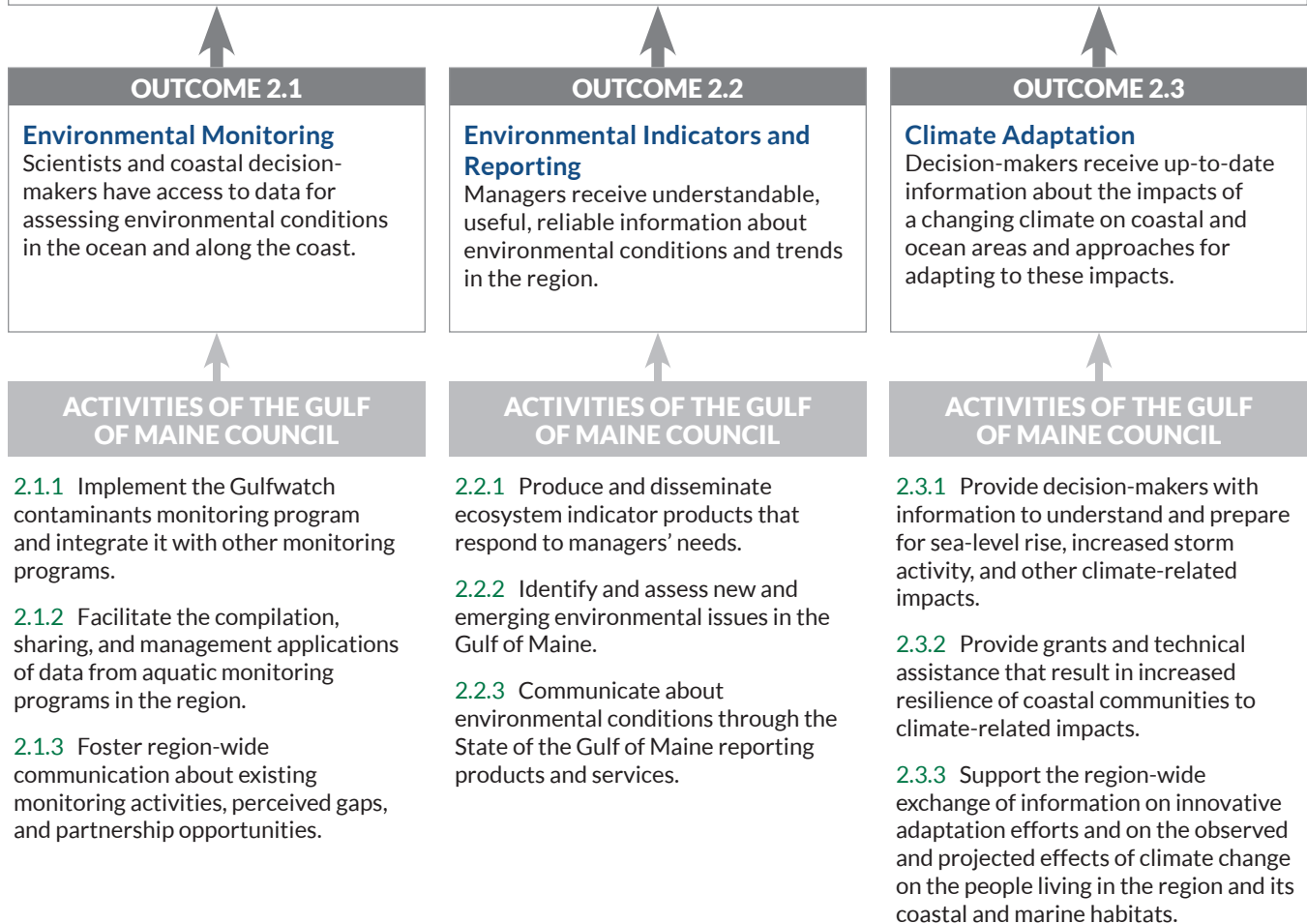
In spite of its amazing natural beauty and historical abundance of marine resources, the Gulf of Maine is a highly stressed ecosystem in urgent need of attention. Hundreds of years of inadequate wastewater and stormwater infrastructure, tremendous pressures on natural resources, effects of shoreline development on coastal ecosystems, results of a changing climate, and the dumping of toxics have taken an enormous toll on the health of the environment and impaired the Gulf's overall potential. For example, raw sewage and polluted stormwater routinely wash into coastal waters. Thousands of miles of migratory fish habitat along rivers and streams are blocked by obsolete dams and poorly engineered road crossings. Invasive species are crowding out some native species and disrupting natural cycles. Sea level rise is threatening coastal habitats and human development alike. New solutions and scientific data to address these issues are being generated constantly. However, often this information does not reach coastal decision-makers around the Gulf of Maine who could put the solutions into action.

Goal 1 activities address the region's need for data, information, and partnerships to restore and conserve marine and coastal habitats.

GOAL 2

Environmental and Human Health

Environmental conditions support the health of people and the ecosystem.



The Need for Regional Action: Goal 2

Each day in the Gulf of Maine, decision-makers such as business people, city planners, mayors, legislators, resource managers, and environmental regulators require information to sustain human communities and to preserve ecological integrity. They must sift through information about the environment, the impacts of human activities, and the changes in conditions brought by climate, toxic contamination, and other factors. They need to make decisions quickly, trying to access and then apply information from numerous sources. The geography of the Gulf of Maine adds to the complexity of their decision-making processes. As climate change continues to affect the Gulf of Maine ecosystem, it becomes ever more important to have easy access to reliable, up-to-date, understandable information and analysis, including regional ecosystem indicators, on which to base management and policy decisions.

Goal 2 activities address the region's need for data, information, and partnerships to ensure that environmental conditions support the health of people and the ecosystem.



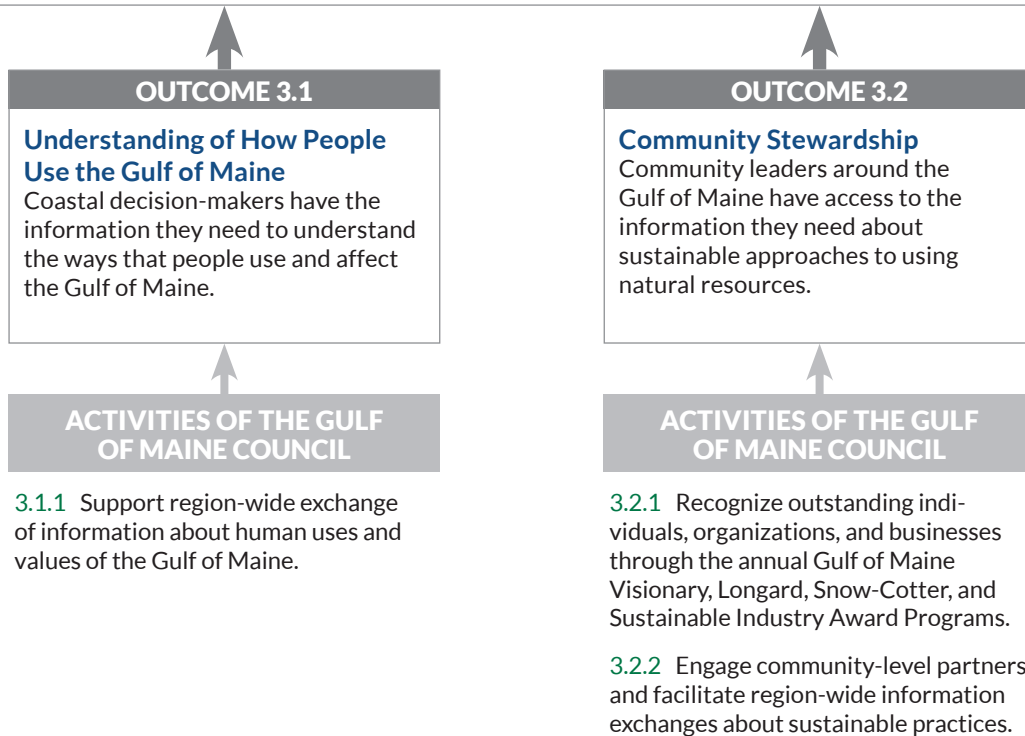
Harvesting shellfish in the Gulf of Maine.

WaterView Consulting

GOAL 3

Sustainable Communities

People who live and work in communities around the Gulf of Maine have information needed to adapt to the changing environment.



The Need for Regional Action: Goal 3

Millions of people live and work in the towns and cities surrounding the Gulf of Maine in Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia. Their economic prosperity and quality of life are tied directly and indirectly to the region's ocean and coastal resources. Fishermen, beachside hotel owners, whale watch operators, and offshore wind investors are only a few examples of the many people whose livelihoods depend on continued access to and sustainable use of the Gulf's natural capital. Achieving sustainability is especially important and challenging as people use the ocean in a growing multitude of ways and as climatic conditions change. Community members and coastal decision-makers in the states and provinces bordering the Gulf of Maine require accurate, relevant, and easy-to-use information in order to adapt successfully to these changes.

Goal 3 activities address the region's need for data, information, and partnerships to adapt to the changing environment.



A working waterfront along the coast of the Gulf of Maine.

Waterview Consulting

Crosscutting Initiatives

THE GULF OF MAINE COUNCIL'S 2012-2017 ACTION PLAN IS ORGANIZED AROUND THREE LONG-TERM GOALS that focus on improving and sustaining the ecological and socioeconomic health of the Gulf of Maine region. The Action Plan also addresses several important themes that span across the three goals.

Climate Change A changing climate and extreme weather events are major regional issues that are already affecting the Gulf of Maine, and the impacts are expected to intensify in coming years. The Gulf of Maine Council is playing an active role in increasing understanding of the impacts and building regional capacity for adaptation. The Council's [Climate Change Network](#) brings the latest climate change science, impacts, and adaptation information to the Gulf of Maine community.

Coastal and Marine Spatial Planning The Canadian and U.S. governments are implementing coastal and marine spatial planning (CMSP) as part of a framework to support ecosystem-based management and sustainable use of ocean resources. Many activities of the Gulf of Maine Council contribute to the implementation of CMSP in the region. The Council's [Coastal and Marine Spatial Planning Committee](#) investigates and makes recommendations on roles and activities for the Council in CMSP, and it tracks and exchanges information on CMSP policies and activities on both sides of border.

Information Exchange and Knowledge Sharing A primary purpose of the Council is to facilitate regional information exchange and knowledge sharing among people engaged in coastal and marine management. This function is particularly important because in the Gulf of Maine region management responsibility is divided among numerous government agencies in two countries, three states, and two provinces. Examples of related Council activities are the [Gulf of Maine Times](#), [Climate Change Network](#), [Ecosystem Indicator Partnership](#), [State of the Gulf of Maine Report](#), and [Habitat Restoration Web Portal](#).

Data Management Many government agencies and non-government organizations engage in research and monitoring in the Gulf of Maine, but data are often distributed among many sources and may be difficult to access. To facilitate data integration and management applications, the Council conducts targeted efforts to compile, manage, and disseminate regional-scale datasets related to the Council's priorities. Examples include the [Ecosystem Indicator Partnership](#) (ESIP) and [Gulfwatch](#).

Council Watch List

In addition to the issues that are specifically highlighted and addressed in the goals and crosscutting initiatives of this Action Plan, the Gulf of Maine Council actively monitors other issues relevant to its mission. These may be recurring issues or emerging issues such as those contained in the [State of the Gulf of Maine Report](#) and specifically the [State of the Gulf Emerging Issues](#) theme paper. As needed, the Council takes action, conducts information gathering, and facilitates communication and knowledge sharing on these related issues.

Ecosystem Indicators The Council is leading a collaborative, regional program to develop, deploy, and communicate science-based, management-relevant indicators for the Gulf of Maine through the [Ecosystem Indicator Partnership](#) (ESIP). The indicators enhance the effectiveness and efficiency of management efforts at regional, sub-regional, and local scales.

Environmental Monitoring Scientific monitoring of environmental conditions in the Gulf of Maine is required for effective management in the region. The Council conducts the [Gulfwatch](#) contaminants monitoring program, supports monitoring initiatives, hosts the [ESIP Monitoring Map](#), and provides management-relevant information based on monitoring data.

About the Council

THE GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT IS A CANADIAN-AMERICAN PARTNERSHIP OF government agencies, non-government organizations, and business interests. The Council's mission is to maintain and enhance environmental quality in the Gulf of Maine and to allow for sustainable resource use by existing and future generations.

A vital role of the Council is to serve as a forum to exchange information, innovative ideas, and lessons learned. It leverages regional skills and expertise, thus making more rapid progress in improving the stewardship of the Gulf's resources. It organizes conferences and workshops on priority issues; conducts integrated environmental monitoring and data synthesis; performs policy analyses; provides grants and awards; accelerates the transfer of science to management via internet-based tools and other mechanisms; raises awareness about the Gulf; and connects people, organizations, data, and information in the region.

Gulf of Maine Councilors are leaders of state, provincial, and federal agencies; non-government organizations; and the private sector. The Gulf of Maine Council fosters consensus-based decision-making and collaboration among a wide range of parties with an interest in the Gulf. Its meetings are open to the public, and its five-year action plans incorporate diverse public input.

Representatives of government agencies, academia, businesses, and non-government organizations participate in the Council's committees. On an annual rotating basis, one of the five states and provinces serves as the Secretariat and coordinates the Council's work. Contract staff located around the region work with the Council and its committees to help accomplish its goals, and non-profit associations support the Council in both Canada and the United States.

Guiding Principles

Four principles guide the Council and participating agencies in their decisions involving the Gulf of Maine ecosystem. These principles are



The Gulf of Maine is bounded by Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts.

Purposes of the Council

In 1989, the Governors of Massachusetts, New Hampshire, and Maine, and the Premiers of New Brunswick and Nova Scotia established the Gulf of Maine Council on the Marine Environment for three purposes.

- **To enable the region's governments to be more effective stewards:** By working together in a regional forum, state, provincial, and federal agencies learn from each other, try new approaches, and as a result are better stewards of the resources for which they are legally responsible.
- **To sustain strong partnerships:** The Council works to be an effective partner and build the capacity of local and regional organizations that are addressing issues of regional concern.
- **To integrate watershed, coastal, and ocean management:** The Council fosters an ecosystem-based management approach. It works to ensure that decision-makers possess the necessary information to manage human effects on the ecosystem, to preserve ecological integrity, and to sustain economically and socially healthy human communities.

congruent with international protocols, as well as state, provincial, and national legislation in Canada and the United States.

- **Ecologically sustainable development**

The Council seeks to meet the region’s current social, cultural, and environmental needs without compromising the needs of future generations. Working in partnership with others, it strives to sustain ecological processes and enhance the region’s quality of life.

- **Ecosystem-based planning and management**

The Council supports collaborative management that integrates economic, social, and ecological values and objectives, emphasizing natural rather than political boundaries.

- **Environmental protection through precaution**

The Council supports conservation of the coastal and marine environment, and urges its members to proceed with caution to avoid environmental degradation.

- **Public information and participation**

The Council is committed to a participatory process that informs and engages the public in setting priorities.



Dieter Weineit

Audiences of the Gulf of Maine Council

Premiers and Governors	The region’s Premiers and Governors, their staff, and regional organizations that they have formed.
Coastal lawmakers	Legislators and elected officials at the federal, state, and provincial levels who have financial and legislative responsibility for coastal and marine issues.
Coastal decision-makers	Management in public agencies, non-government organizations, and businesses.
Coastal managers	Policy and science representatives in government agencies, non-government organizations, and businesses.
Academics	University scientists and other scholarly researchers.
Gulf residents and visitors	People who live, work, and play in the Gulf of Maine region.
Marine-dependent industries	Businesses, individuals, and organizations that derive most of their income from activities tied to the marine environment.
Science community	Individuals and organizations involved in research, monitoring, ocean observing, and assessment.

Role and Sphere of Influence

- As a transboundary organization, the Council is uniquely positioned to focus on issues that require or benefit significantly from regional collaboration.
- The Council's work often involves collaboration at municipal, state, provincial, national, and bi-national levels.
- While the Council does not have direct regulatory or policy-making authority of its own, its goals and outcomes are congruent with state, provincial, and federal priorities. The Council promotes progress toward common goals.
- The Council's work focuses on complex natural and socioeconomic systems, making it a challenge to attribute particular outcomes to the organization's efforts. However, the Council knows that assessing results is essential for continued success.
- A strength of the Council is that it is a coalition of people from many groups. However, this organizational structure can result in the Council's role being camouflaged, as initiatives may occur under the banners of member and partner organizations.
- The Council will report on regional progress toward the goals in this Action Plan. This recognition will identify the lead organizations, including direct activities of the Council, its partners, and the work of others.

Vision for the Future

The Council was formed in recognition of the need for natural resource and socio-economic management spanning political and bureaucratic boundaries. Building on its past accomplishments, the Council will continue supporting region-wide information gathering and sharing (e.g., seafloor mapping, environmental monitoring, science translation to management, indicators, state-of-the-environment reporting), public outreach and education, habitat restoration, and addressing key science and policy gaps.



The Council will continue to foster innovative approaches to sharing information and enhancing collaboration. By working together in a regional forum, the states, provinces, and federal agencies learn from each other, try new approaches, and coordinate their efforts. As a result, they become better stewards of the resources for which they are responsible.

The Council will continue to nurture strong partnerships among local, regional, and national organizations that are responsive to issues of regional concern. Wherever appropriate, the Council will participate and assist these groups, often seeking to build their capacity by creating strategic alliances.

Five-year Summary of Accomplishments: 2007-2012

Working Collaboratively in the Bi-National Gulf of Maine and Its Watershed

SUMMARIZED BELOW ARE ACCOMPLISHMENTS OF THE GULF OF MAINE COUNCIL AND ITS PARTNERS BETWEEN 2007 and 2012. This work was guided by the Council's 2007-2012 Action Plan, which described how governments, communities, non-profit organizations, and marine commerce interests agreed to address the Gulf's most pressing habitat, environmental, and community issues that require a coordinated regional response.

Goal 1: Coastal habitats are in a healthy, productive, and resilient condition.

Synopsis of accomplishments 2007-2012:

The Council funded **49 new habitat restoration projects** that were performed by municipal governments, non-profits, and other partners. Projects conducted during this period received U.S. federal grants totaling US\$2.5 million and attracted US\$3.8 million in matching non-federal support. The projects restored 335 salt marsh acres and approximately 126 miles of barrier-free streams, in addition to improving other subtidal, intertidal, and channel-riparian habitats. The projects opened an estimated 145 miles of streams to fish passage and made 1,562 acres of lakes re-accessible to spawning alewife. The Council produced a **regional framework** for science-based monitoring of the ecological outcomes of dam removal and other types of stream barrier removal. The Council's **Gulf of Maine Mapping Initiative** (GOMMI) identified regional priorities for mapping of seafloor habitats, and it helped to address these priorities by supporting mapping fieldwork and organizing major workshops. The Council completed documentation of coastal and marine managed areas in the Canadian portion of the Gulf of Maine. Through numerous **publications**, workshops, and web-based resources, the Council facilitated regional communication and information sharing on habitat restoration, habitat conservation, habitat monitoring, and seafloor mapping.

Goal 2: Environmental conditions in the Gulf of Maine support environmental and human health.

Synopsis of accomplishments 2007-2012:

The Council launched the **State of the Gulf of Maine** reporting series, which produces and disseminates peer-reviewed reports with the latest information on leading issues affecting the Gulf of Maine, such as climate change and invasive species, as well as a Gulf-wide synthesis of management issues and responses. The Council's **Gulfwatch Program**, established in 1991, continued to monitor contamination of coastal waters at sites around the Gulf of Maine, provided the data and findings to resource managers, and facilitated pollution control within a regional context. The Council established the **Climate Change Network** to build regional capacity for proactive management and adaptation to the impacts of climate change. The Council's **Ecosystem Indicator Partnership** (ESIP) defined a regional framework for ecological indicators, began synthesizing data for six categories of ecosystem health indicators, and produced web-based interactive maps and tools for government, non-profit organizations, and marine businesses.

Goal 3: Gulf of Maine coastal communities are vibrant and have marine-dependent industries that are healthy and globally competitive.

Synopsis of accomplishments 2007-2012:

The Council created the **Sustainable Industry Awards**, which is the only regional-scale recognition program for businesses that demonstrate innovation and leadership in efforts to improve the wellbeing of the Gulf of Maine ecosystem and the communities that call it home.

Overview of Programs and Initiatives

- The [Habitat Restoration Program](#) provided grants, in partnership with the U.S. National Oceanic and Atmospheric Administration Restoration Center's Community-based Restoration Program, to restore degraded habitats and to support a strategic approach to marine, coastal, and riverine habitat restoration.
- The [Habitat Restoration Web Portal](#) introduces the topic of habitat restoration, documents restoration projects, describes how to conduct a restoration project, and provides a library of restoration materials.
- Published continuously for over sixteen years, the [Gulf of Maine Times](#) is an unbiased source of information about research and management happenings in the Gulf of Maine/ Bay of Fundy. It helps people understand, appreciate, and preserve the region's diverse and complex watersheds and marine environments.
- The [Ecosystem Indicator Partnership](#) upgraded the online [Ecosystem Indicator Reporting Tool](#) and [Ecosystem Monitoring Map](#), produced theme-oriented indicator fact sheets, convened training workshops, and disseminated information about the health of the ecosystem.
- The [State of the Gulf of Maine](#) initiative was launched to provide state-of-the-environment reporting for the region. It produced *The Gulf of the Maine in Context*, an overview of the region's natural and socioeconomic environment and management setting, and a series of theme papers that focus on important issues within the Gulf, based on priorities identified by the Council.
- The [Gulfwatch Monitoring Program](#) measured and reported on contaminants in coastal waters at numerous sites around the Gulf of Maine. The Program conducted a peer review of its science and completed a thirteen-year review and analysis of its data collected.
- The [Climate Change Network](#) brings the latest climate change science, impacts, and adaptation information to the Gulf of Maine community. It commenced work on a highly collaborative two-year initiative that is documenting best practices and innovative municipal adaptation approaches in the region; providing municipal technical assistance grants to implement adaptation approaches; and disseminating adaptation/resiliency communications materials.
- The [Gulf of Maine KnowledgeBase](#) is a searchable online library of management and scientific publications on the region's priority marine and coastal issues. The KnowledgeBase promotes information-sharing about resource management in the Gulf and its watershed.
- The [Action Plan Grants Program](#) offered grants to citizen groups and community organizations to pursue projects that supported priority goals in the Council's Action Plan. Through a competitive grant process, the Program provided awards of up to US\$10,000 to ten projects in 2007-08.

Selected Publications and Communication Products

- The [State of the Gulf of Maine Report](#) provides a peer-reviewed synthesis through a modular series of documents and theme papers on topics such as *The Gulf of Maine in Context*; *Climate Change and Its Effects on Humans*; *Climate Change and its Effects on Ecosystems, Habitats and Biota*; *Coastal Ecosystems and Habitats*; *Marine Invasive Species*; and *Emerging Issues*.
- The Council's website, gulfofmaine.org, is the most comprehensive information source about the Gulf of Maine ecosystem and management actions in the region. It offers a toolbox of publications, social networking resources, databases, and interactive maps.
- [Salt Marshes in the Gulf of Maine: Human Impacts, Habitat Restoration, and Long-Term Change Analysis](#) provides an overview of the valuable ecological functions of healthy salt marshes, human impacts on salt marshes, methods for restoring salt marsh habitats, and the need for a regional salt marsh monitoring program.
- [Status, Trends, and Conservation of Eelgrass in Atlantic Canada and the Northeastern United States](#) describes eelgrass status and trends in the region, habitat functions and values, approaches to setting nutrient and habitat criteria, the effects of invasive species and climate change on eelgrass, and programs and partnerships for eelgrass conservation.
- [Habitat Classification in the Gulf of Maine: A Review of Schemes and a Discussion of Related Regional Issues](#) provides background information on marine habitat classification and current research to develop classification schemes in the Gulf of Maine.
- [American Eels: Restoring a Vanishing Resource in the Gulf of Maine](#) reviews the need, challenges, and methods for American eel restoration in the region.
- [Stream Barrier Removal Monitoring Guide](#) presents a standardized framework for monitoring the ecological changes that occur when dams, culverts, and other stream barriers are removed.
- [Industry Engagement with the Gulf of Maine Council on the Marine Environment](#) offers recommendations to the Council in three primary areas: industry engagement; coordination and communication; and services the Council can provide to industry.
- [Gulf of Maine Ecosystem-Based Management Toolkit Survey Report](#) provides region-specific information on management issues to which practitioners seek to apply ecosystem-based management (EBM), discusses critical obstacles to implementing EBM, and suggests tools and information needed to put EBM into practice.

Glossary

Adaptation The coordinated method of making adjustments in our decisions, activities, and thinking in response to observed or expected changes in climate, with the goal of moderating harm and taking advantage of new opportunities that may be presented by these changes.

Coastal and marine spatial planning (CMSP) A comprehensive, adaptive, integrated, ecosystem-based, and transparent spatial planning process, based on sound science, for analyzing current and anticipated uses of ocean, coastal, and Great Lakes areas. CMSP identifies areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives.

Cumulative impacts The combined effect of human activities on the ecosystem. Cumulative impacts can result from multiple instances of the same activity or from different activities. The activities need not occur at the same place or time to result in cumulative impacts on the ecosystem. For example, construction of roadways, building of seawalls, and use of lawn fertilizers and pesticides along the shores of a particular bay may be done by different people on their properties over a period of years. Together these activities result in cumulative impacts on the coastal marine ecosystem.

Ecosystem A dynamic complex of plants, animals, microbes, and physical environmental features that interact with one another. Humans are an integral part of marine and terrestrial ecosystems. The interconnectedness within and among ecosystems is provided both by the physical environment (for example, currents transporting larvae from one part of the ecosystem to another) and by biological interactions (for example, kelps or sea grasses creating habitat or predators consuming prey).

Ecosystem services The conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. Examples include provision of clean water, maintenance of livable climates (carbon sequestration), pollination of crops and native vegetation, and fulfillment of people's cultural, spiritual, intellectual needs. Marine ecosystems benefit humans by providing services such as food (fish, shellfish and seaweed); medicines; water purification; protection of shorelines from erosion and storm damage; control of diseases and pests; nutrient cycling; moderation of climate and weather; recreation; and spiritual, religious and other nonmaterial benefits. The interactions within an ecosystem produce these services. Each ecosystem provides a range of services. Although some goods have significant economic value, most other essential services are not commonly assigned economic worth. Examples of services that are at risk because they are undervalued include protection of shorelines from erosion, nutrient recycling, control of disease and pests, climate regulation, cultural heritage, and spiritual benefits. Current economic systems attach no dollar values to these services; they are typically not considered in policy decisions and many are at risk.

Ecosystem-based management An integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive, and resilient condition so that it can provide the services humans want and need. Ecosystem-based management differs from current approaches that usually focus on a single species, sector, activity, or concern; it considers the cumulative impacts of different sectors. Specifically, ecosystem-based management: emphasizes the protection of ecosystem structure, functioning, and key processes; is place-based in focusing on a specific ecosystem and the range of activities affecting it; explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species; acknowledges interconnectedness among systems, such as between air, land, and sea; and integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependences. (Reference: [McLeod et al. 2005](#))

Gulf of Maine A 36,000-square-mile area of the northwest Atlantic Ocean bordered by three states (Massachusetts, New Hampshire, and Maine) in the northeastern United States and two provinces (New Brunswick and Nova Scotia) in

Canada. It is home to one of the richest marine ecosystems in the world and supports renowned fisheries. Georges Bank and Browns Bank mark the offshore boundary between the Gulf of Maine and the rest of the Atlantic Ocean.

Gulf of Maine watershed A total land area of 69,115 square miles (179,008 square kilometers) that drains into the Gulf of Maine. It encompasses much of Nova Scotia, New Brunswick, New Hampshire, and Massachusetts, all of Maine, and a small portion of Quebec.

Habitat The place where an animal or plant lives and that has the environmental conditions needed for that species to survive. Habitats support many different communities of animals and plants. Natural or human-caused activities may change habitats and the species living there. Examples of habitats in the Gulf of Maine include rocky reefs, salt marshes, eelgrass beds, and sandy or muddy bottoms.

Habitat restoration The process of returning a polluted or degraded habitat—such as a salt marsh, eelgrass bed, or river—to its natural condition. The goal of habitat restoration is to help the structure and functions of habitats, enabling them to play their natural roles in the ecosystem. Habitat restoration projects expedite the process to rebuild a healthy ecosystem that functions like it did prior to being degraded. Restoration projects usually address entire habitats that can support numerous species, rather than focusing on single species.

Indicators Quantitative or qualitative measures that provide information about the status of or changes in natural, cultural, and economic aspects of an ecosystem. Examples of some possible indicators include coliform bacteria counts, measures of harmful algal blooms, levels of toxic chemicals in seafood, and abundance and diversity of fish and invertebrate species.

Invasive species A non-native plant or animal species that has been deliberately or accidentally transported and released into a foreign environment through human activities and has successfully taken hold in that environment, causing ecological damage in the process. Also called alien, exotic, introduced, non-indigenous, and aquatic nuisance species.

Land-based activities Human activities on land that directly or indirectly affect the coastal and marine ecosystem. Examples include land development, pollution emissions, and use of fertilizers and pesticides.

Natural capital The living and non-living components of Earth that provide ecosystem services such as oxygen production, water filtration, food production, and erosion prevention.

Nonpoint source pollution Pollution originating from diffuse sources, such as runoff of chemicals from the land and deposition of airborne pollutants.

Point-source pollution Pollution originating from a well-defined point, such as a pipe. Discharge from a sewage treatment plant is an example of point-source pollution.

Regionally significant coastal habitats (RSCH) A term used by the Gulf of Maine Council on the Marine Environment for habitats that the Council has identified as regional priorities for management, protection, and restoration.

Science translation The process of transferring scientific facts and knowledge to people who are not scientists (e.g., resource managers, policy makers, educators, the public) using audience-specific communication strategies and techniques.

Sustainable development Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Working waterfront Sites and facilities providing physical access to the sea for commercial fishing and other marine commercial activities; additional facilities and services, which may not be located immediately at the shore, needed to support marine commercial activities.

