GULF OF MAINE
CLIMATE CHANGE NETWORK TASK FORCE:
MEETING REPORT


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MARCH 22 – 23, 2006

ENVIRONMENT CANADA &
GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT

GULF OF MAINE CLIMATE CHANGE NETWORK TASK FORCE: MEETING REPORT

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SYNOPSIS

On 22 & 23 March 2006, a meeting of climate change practitioners, from geographical locations surrounding the Gulf of Maine and representing provincial, state and federal governments on both sides of the Canada-US border, was held in Halifax, NS.

The main objective of the meeting was to reach consensus on the way ahead for a climate change network focused on climate change issues in the Gulf of Maine coastal, offshore and watershed areas.

The result of this meeting was to set out, for Gulf of Maine Council approval, a set of activities and goals that, once put into action, would develop a mechanism to gather and deliver climate change information relevant to the Gulf of Maine.

This report provides the background of the climate change issues, details of the discussion that occurred at the meeting and a listing of the recommendations that resulted from the participants' consensus.

Those recommendations can be summarized by…

- Gulf of Maine Working Group approves the process for framing activities for council approval, i.e have the climate change network prioritize issues and bring forward suggestions/recommendations to working group and council.

- Gulf of Maine Working Group approves and supports intermediate steps agreed to at the meeting
    - delivery on activities and products detailed in Action Plan 2006
    - development of climate change network

- Gulf of Maine Working Group bring recommendations to council

1. INTRODUCTION

In June of 2001, the Gulf of Maine Council (GOMC) issued their 5-year Action Plan based on specific goals that the Council saw as necessary to maintain and improve the integrity of the marine environment. Out of this Action Plan came the following objective:

Goal 1: Protect and Restore Coastal and Marine Habitats
Coastal and marine habitats throughout the Gulf of Maine (GOM) are healthy and support the Gulf's diversity of plant and animal species.

Objective (a) Increase Awareness and Improve Management of Regionally Significant Habitats

(i)Improve Management

Provide resource managers with relevant habitat information and encourage them to consider their decisions within a larger ecosystem context.

Action Item 8… ***Convene state, provincial, federal, and international organizations working on climate change impacts to begin developing regional and local adaptation strategies, encourage cooperative research, and disseminate needed information to resource managers.***

In June 2005, the GOMC hosted an **Emerging Issues Forum**, organized by the Climate Change Network Task Force, on the topic of Climate Change and the GOM. From the presentations that day and the discussion that followed, it was clear that there was concern about the lack of knowledge of climate change issues in the GOM and an absence of any organizational mechanism to research and compile the necessary knowledge and deliver that knowledge to climate change practitioners and the general public.

In the Fall of 2005 and Spring of 2006, the Gulf of Maine Working Group (GOMWG) has been working to develop a new set of outcomes that will be presented to GOMC later in 2006 for approval as the next 5-year Action Plan. Climate Change is considered by the Working Group as a key issue that can exist within the plan as an integrating element, to be included in all three GOMC Goals.

In January and March of 2006, specific outcomes were developed, based on the GOMC Goals. The short-term outcomes (1-3 years) included results specific to climate change issues. In order to get those results, climate change activities including information sessions were identified across all three goals. One activity of note was the creation of the climate change network.

1.1 Purpose and reason for the meeting

While important information and GOMC feedback was received during the Emerging Issues Forum in June, no specific direction was given as to how to integrate climate change information into GOM organizational decision processes. Neither was there direction on how to gather and then deliver information to GOM members and the general public.

Members of the GOM Climate Change Network Task Force (CCNTF) recognized that a gathering of climate change practitioners was needed to identify what the issues were, what

organizational mechanisms already existed in the New England – Atlantic Canada region to provide climate change information and what mechanism needed to be created to deliver that information.

An opportunity arose when funding from the Ocean Action Plan, an initiative of the then Liberal Government of Canada, was successful in securing funding for Ocean-related activities in the region. A specific project was developed, with its prime objective of holding an EC-GOM meeting to discuss and reach consensus on the main issues.

While a mid-April 2006 time frame would have been easier to plan for, the meeting was scheduled for late March 2006, a week following regular GOMWG Meetings.

1.2 Meeting Welcome

The meeting began with a welcome from Bill Appleby, Director of the Meteorological Services of Canada, Atlantic Operations, Environment Canada. He spoke briefly about the importance of the Gulf of Maine, both physically and organizationally and the necessity to discuss issues pertaining to the Gulf of Maine and its preservation. Mr. Appleby suggested that planning and awareness are the necessary components in maintaining and preserving the GOM ecosystem and described how this meeting was an excellent opportunity to help shape the future of climate change work in the GOM.

Gary Lines, co-Chair of the GOM CCNTF and Head of the Climate Change Section for Environment Canada in the Atlantic Region also welcomed participants and gave an overview of the agenda of the meeting. He outlined the meeting objectives and expressed his general sentiment that the meeting would be flexible in order to capture the ideas of the participants. The objectives of the meeting were:

- To identify and come to a consensus on key climate change issues in the GOM Region, and
- To determine the appropriate/effective mechanism(s) to address those issues
- To integrate the outcomes from this meeting into the GOMC Action Plan for 2006-2011

Mr. Lines stated that although there were not as many participants as expected, this meeting will likely still fulfill the goals outlined in the original invitation. It was expected that attendance was low due to restrictions in travel of potential participants from the US, it being near the end of fiscal year as well as the fact that potential participants had already spent part of the previous week at the GOMWG meetings in St. Andrew New Brunswick.

2. MEETING ITEMS

2.1 Present

The following is the contact information for the participants of the March 22-23, 2006 EC-GOMC Climate Change meeting:

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2.2 Background Discussion Papers

A series of background discussion papers were developed specifically for this meeting. The intent was to allow meeting attendees to be aware of what exactly would be covered during the meeting and allow them time to prepare for participation at the meeting. It was anticipated that the background discussion papers would start the brainstorming process before the meeting. They describe briefly how climate change became an issue for the GOMC on the Marine Environment; provide an overview of climate change impacts in the Gulf of Maine; provide examples of existing information management mechanisms; and set up a series of preparatory questions for the EC-GOMC Climate Change Meeting.

The list of climate change impacts was not supposed to be exhaustive, only to provide a starting point for discussion on the scale of the issue and the quality/quantity of available information on this subject. The information management mechanisms fall into two main categories: information management mechanisms in the GOM and climate change mechanisms in existence not specific to the GOM. Armed with this information, participants will be able to discuss what type of mechanism(s) could benefit the GOMC in dealing with climate change and which existing mechanisms could be used to help in that objective.

Both the meeting agenda and the background discussion papers were structured around the deliverables outlined in the project work plan and application for funding – internal grants document:

1. Develop documentation that will act as discussion paper(s) for workshop – discussion papers on each of the networks objectives as support to the workshop and network
2. Develop an Outreach Plan
3. Develop details of Network Terms of Reference and future projects - finalize a contact list for climate change network

2.3 Agenda

The principle objective for the first day of the meeting was to discuss climate change in the GOM. This includes both determining what the primary climate change issues and impacts are likely to be in the GOM as well as what information is available for each of those impacts. As well, solutions to any climate change issues tied to the GOMC approach were to be addressed on day one. The deliverable for day one was to arrive at a general consensus for prioritization of climate change issues and research items.

The principle objective on the second day was to discuss potential information management mechanism(s) for addressing climate change in the GOM as well as methods of developing effective outreach for delivering that information. The deliverable for day two was to arrive at a general consensus regarding the mechanism needed to best serve the GOMC in its quest to protect, maintain and ensure the longevity of ecosystems, human health and economies within the GOM.

(See Appendix A)

3. CURRENT KNOWLEDGE

3.1 Environmental Issues in the Gulf of Maine

The Gulf of Maine is host to a unique marine ecosystem, whose resources are shared by both Canada and the United States. Three US states and two Canadian provinces border its coastal shores and rely on the resources for their economy and well-being. Unfortunately, increasing development, in addition to centuries of human use in the area has altered, and in many cases damaged the ecology of the region.

As the human population has grown in the GOM region, so has the demand for food and infrastructure. Today, more than half of the Gulf's tidal marshes and wetlands have been filled or converted to agricultural lands. Roads and coastal development often disrupt and fragment sensitive habitat. As well, dams and tidal restrictions alter the natural flow of water and in turn, block the migration routes of anadromous fish. Other, more indirect impacts include over-harvesting of certain fish species, and the introduction of invasive species. These human-caused stresses have lead to increased incidences of pollution, coastal erosion and species extinctions.

In 1989, with the formation of the GOMC, collaborative work began on maintaining and enhancing environmental quality in the GOM and ensuring sustainable resource use by existing and future generations. To begin their mission, the GOMC developed three primary goals. In the 2001-2006 Action Plan, these goals are stated as:

Goal 1: Protect and Restore Coastal and Marine Habitats
Coastal and marine habitats throughout the Gulf of Maine are healthy and support the Gulf's diversity of plant and animal species.

Goal 2: Protect Human Health and Ecosystem Integrity
Contaminants in the Gulf of Maine are at sufficiently low levels to ensure human health and ecosystem integrity.

Goal 3: Encourage Sustainable Maritime Activities
The Council's vision for 2025 is that marine research and nature-based tourism provide unique and significant economic opportunities for the region. During the next five years, the Council will create strategies to achieve these new objectives.

The basis of the first goal is the improvement of the health of the coastal and marine habitats around the GOM. According the GOMC the task of remedying the harms done is not simple. In addition to comprehensive land-use planning and concerted efforts to reduce pollution, actions to protect remaining habitats must be matched by successful restoration.

While extensive coastal development has changed the ecosystem and added to the stresses of human impacts in the GOM, natural changes within the Gulf region are also ongoing. For example, accelerating global climate change could have unpredictable effects on the GOM in the future. An appreciation for the dynamic properties of the entire GOM ecosystem and these layers of change must inform the GOMC's work as they plan actions for conservation and restoration.

3.1.1 Climate Change, an Emerging Issue in the Gulf of Maine

In July of 2000, the Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP) had a meeting to discuss climate change, as its far-reaching impacts may have harmful consequences to the environment and the economy in the GOM. In August 2001, they released their Climate Change Action Plan, which outlines their basis for action and regional goals dealing primarily with the reduction of greenhouse gases. Climate change is a global problem which requires joint international efforts – a regional approach to strategic action. The Conference therefore directed its Committee on the Environment and the Northeast International Committee on Energy (NICE), into collaboration with the New Brunswick Premier's Round Table on Environment and the Economy to achieve their goals.

The GOMC has also adopted the challenge of confronting climate change issues. This effort, which focuses more on impacts and adaptation than the plan of the NEG-ECP, was instigated due to rising interest within their own operations to address this growing issue.

In the 2001-2006 Action Plan, climate change falls within the scope of Goal 1, Objective (a), to "increase awareness and improve management of regionally significant habitats – Ensure that 50 percent of professionals involved in coastal/marine habitat science, policy and management are aware of the Gulf's regionally significant habitats and are working to improve their management" (GOMC 2002). The climate change action item aims to provide resource managers with relevant information and encourage them to consider their decisions within a larger ecosystem context.

> Convene state, provincial, federal, and international organizations working on climate change impacts to begin developing regional and local adaptation strategies, encourage cooperative research, and disseminate needed information to resource managers.

The first step to fulfill this action item, the GOM CCNTF was formed.

In June 2005, climate change issues were discussed at the Emerging Issues Forum sponsored by the GOMC. Feedback provided in that forum was then used to propose the upcoming "EC-GOMC Climate Change Meeting" on March 22-23, 2006.

3.2 Climate change

3.2.1 Global scale (IPCC)

Human activities, since the pre-industrial era, have caused an increase in atmospheric concentrations of greenhouse gases and aerosols, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These greenhouse gases reached their peak atmospheric concentrations in the 1990s. Human activities such as the combustion of fossil fuels, agriculture, and land-use changes were primarily responsible for the high levels of these gases. Human activities are also likely being impacted by the changes these gases are incurring in the atmosphere. However, because climate is not the only factor affecting ecosystem change, quantifying the relative impact of climate change is difficult.

Ethan Nedeau (2004), a science translator for the GOMC, summarized the IPCC's major predictions as follows:

- By 2100, worldwide average surface temperatures will increase by 1.4-5.8°C (2.5-10.4°F) above 1990 levels. The most drastic warming will occur in northern latitudes in the winter.
- The sea level rose 10-20 cm (4-8 inches) in the 20th century and may rise another 9-88 cm (4-35 inches) by 2100.
- Global precipitation is likely to increase, with more precipitation and more intense storms in the mid-high latitudes in the northern hemisphere.

International Panel on Climate Change (IPCC) climate models project that increasing atmospheric concentrations of greenhouse gases will change the frequency, intensity, and duration of extreme events. More hot days, heat waves, heavy precipitation events, and fewer cold days are expected. As a result of these projected changes we may, in time, see increased risks of floods and droughts in many regions. The impacts of climate change on ecological systems, socio-economic sectors, and human health will be predominantly negative (IPCC 2002).

3.2.2 Regional scale

Temperature

Historic trends

The New England Regional Assessment (2001) and Environment Canada (2002) show a mild warming trend in the GOM region. An increase of approximately 0.2-0.9°C (0.4-1.7°F) has occurred in the last 60-100 years. In Atlantic Canada, 2005 was the 7th warmest year on record since 1948.

Regional predictions

IPCC models predict temperature increases of 3 to 5°C (5.5-10°F) over the next 100 years for New England and eastern Canada (IPCC 2001). The greatest changes in temperature will occur in the winter and early spring, in the northern hemisphere. These climate changes are expected to be the largest and most rapid of the last 10,000 years.

Some factors, such as land use change and urbanization, may exacerbate warming as solar radiation is more readily absorbed. Other factors, some atmospheric pollutants (soot, dust, aerosols), may actually moderate the expected warming by contributing to the formation of clouds. Clouds, fog and haze reduce the amount of solar radiation reaching the ground and therefore may even lead to regional cooling.

Precipitation

Historic trends

The New England Regional Assessment (2001) and Environment Canada (2002) show a slight increase in precipitation in the GOM region. In 2005, the western part of New Brunswick experienced 10% more precipitation than the normal and Nova Scotia experienced 20% more (since 1948). The New England coastal regions experienced a 16.8% increase in precipitation over the last 100 years.

Regional predictions

Climate model predictions forecast changes in the frequency and intensity of coastal storms, with great variability between regions (Michener et al. 1997). The Gulf of Maine region may become more vulnerable to tropical storms as ocean surface temperatures warm. Where, in the past, hurricanes and tropical storms would often diminish in strength as they moved north, future changes may cause them to strike this region more often (Nedeau 2004).

Other factors

NOA and THC

Large-scale variations in climate patterns such as the North Atlantic Oscillation (NAO) – a regional component of the larger Arctic Oscillation – and changes in ocean patterns such as the Thermohaline circulation (THC) affect coastal conditions in the GOM. For example, the rate of warming and freshening in the North Atlantic Ocean could affect the path of the Gulf Stream. If the THC is weakened or slowed, warm salty water from the Gulf Stream will no longer move northward to cool and sink. This would result in a southward shift of the Gulf Stream with huge implications for atmospheric circulation in the Northern Hemisphere.

3.3 Discussions, Decisions, Actions

On going discussion at the meeting regarding items 1 (Climate Change Issues) and 2 (Climate Change Information) to the following decisions and action items:

First Agenda Item: Climate Change Issues

The biggest expressed concern from the group was that GOMC's focus is primarily on coastal issues and does not include upstream (in watersheds) or offshore issues. It was later discussed

that this was not entirely true; however, the group felt that the GOMC focus should not limited to one component issue, rather, it should be on the integrity of the ecosystem. This would include a much larger geographical scope (upstream/watershed-coastal-marine), as well as looking at environmental, social, economic, public health and community concerns. These concerns should be addressed both from a mitigation and adaptation perspective.

The group also addressed the idea of time scale. Climate change action on the part of GOMC is currently part of their short term outcomes. This raised the question whether climate change fits in a short-term, mid-term, or long term time scale. The group agreed that big picture approach was necessary to provide complete and sustainable management of the GOM.

One of the major climate change issues discussed was the physical impact in coastal areas and the effects on restoration and coastal management of wetlands. Climate change will have profound effects on the future of wetlands in the GOM. This is critical, especially in terms of the unavoidable rise in sea level. However, sea level rise will not be the only factor affecting the coastline. Climate change will also affect the entire GOM watershed, especially from impacts due to extreme weather. It may be the case that contaminants will be released from the watershed in circumstances of extreme precipitation and/or flooding. We must therefore consider how to deal with these contaminants that can travel from watersheds to coastal regions as a result of climate change.

A second major climate change issue which was not addressed directly in the background discussion papers was the loss of biodiversity. This is a major factor and should be included on the list of climate change impacts. It remains to be seen whether flora and fauna in the GOM and surrounding areas can survive climate change. Humans depend on the diversity of this area for many aspects of their daily lives, including their economy. Therefore, it is crucial to focus on those specific resource-based economies directly affected by climate change (e.g. aquaculture, fisheries).

The concept of CO_2 as a potential contaminant in the GOM was brought up for discussion. Even at current levels, CO_2 could be construed as a contaminant in the ecosystem. After much discussion, it was decided that bringing CO_2 into the equation would not be constructive; however, it is important to take action to maintain the current low levels of CO_2.

Other issues discussed included the fact that climate has a more significant impact on human health that we tend to give credit; that water quality, as apposed to air quality, has been the major focus thus far; that environmental refugees will become a growing concern in the future as more extreme events cause damage to highly populated areas; and that better climate models are crucial in taking the next step in terms of rallying action for mitigation and/or adaptation measures against climate change. Finally, it was pointed out that not all aspects of climate change are bad and there is a need to move ahead and promote some of the positive aspects of climate change.

Second Agenda Item: Climate Change Information

There was a general consensus among the group that although information gaps likely do exist at the scientific level with regard to climate change in the GOM, as a group they did not posses the

scientific expertise to determine what those gaps were. However, it was agreed that scientific indicators are necessary in order to carry out responsible management of the GOM. To maximize the effect scientific indicators can have, it was suggested that this information (past and present) should be compiled, maintained and updated continuously in a central database. The benefits of a central database were seen as two fold:

1. It could allow for scientific indicators to be cross-referenced.
2. Such a database, if made available to the general public, could serve as valuable education tool.

Throughout the duration of the discussion several changes and additions were made to the original impacts list from the first discussion paper (See appendix B).

Climate Change Impact List (Additions and Suggestions):

a. Forests – how does this fit into the scope of GOMC
    i. *Additions*: Forest fires, soil, and erosion
b. Lakes & Ponds – how does this fit into scope of GOMC.
c. Rivers & Streams – *Additions*: ice and snow (cover/melt), changes in salinity
d. Human Health – *Additions*: environmental refugees
e. Economies – *Additions*: insurance real estate, municipal infrastructure and invasive species.
f. New items: biodiversity, soils, water budget

4. FUTURE INFORMATION MANAGEMENT MECHANISMS

The diversity of life in the GOM does not end with the biological diversity of the wildlife; there are a wide variety of practitioners, academics, decision-makers and interest groups working within the GOM region. Their work affects the environment – the ecology around them – and the environment impacts their lives as well. It is crucial that these people are aware of both of these relationships, in order to minimize negative impacts of climate change in both directions.

According to Environment Canada (2005a), "the climate change problem and the related changes it may bring about are among the most serious of the environmental issues that we face today". Scientific consensus states that climate change is happening, and that it could have far reaching and unpredictable environmental, social and economic consequences. In other words, there may be serious implications for our health, our economy and our future.

The seriousness of the issue makes it essential that climate change research is happening and that the information is available to everyone within the GOM. As mentioned in Part 1 of the GOM Climate Change Discussion paper, the GOMC aims to maintain and enhance environmental quality in the GOM and to ensure sustainable resource use by existing and future generations. Because climate change has consequences for environmental quality and sustainable resource use, it has become an emerging issue for GOMC; specifically how information can be made accessible to the population of the GOM.

Effective distribution of climate change information in the GOM requires effective tools (mechanisms) for both gaining and delivering that information. To move forward on the future direction of information management mechanisms, requires a thorough examination of current

GOMC mechanisms for gaining and delivering information as well as existing mechanisms outside of the GOMC that facilitate the exchange of climate change information.

The remainder of this paper is an overview of information management pertaining to climate change in the GOM, beginning with mechanisms for gaining and delivering climate change information. Potential forms/styles/types of climate change information and the tools for managing that information are also included.

4.1 Mechanisms for gaining and delivering climate change information in the GOM

4.1.1 GOMC mechanisms for gaining and delivering information

Conferences/workshops/symposia

Conferences, workshops and symposia are meetings designed for the exchange of views and information which usually involves the discussion of a topic, and often presentations made by participants from the audience (WF 2006). Since its formation, the GOMC has hosted more than 40 conferences, workshops and symposia on research, education, and policy topics.

In 2003, the GOMC was planned a symposium to review possible core elements of an eco-tourism strategy that could serve as an organizational voice promoting responsible tourism practices (GOMC 2002).

Other gatherings include a workshop with local, state, provincial and federal agencies and stakeholders, to strategize ways to reduce priority contaminants, and a conference to raise awareness and build support for measures to reduce the introduction and spread of Aquatic Nuisance Species (ANS).

Training initiatives

International science-based info/training to decision-makers

Support for the expansion of the GOMC's coastal training initiative in the US, and the creation of a parallel program in Canada were part of 2001-2006 Action Plan. This international training is intended to provide resource managers with relevant habitat information and encourage them to consider their decisions within a larger ecosystem context. As well, the dissemination of information on contaminants and their effects will help resource managers reduce damage caused by sewage, nitrogen and mercury (GOMC 2002).

Online directory

- People Finder

People Finder is an online directory of contact information for thousands of regional organizations and individuals working for the GOM ecosystem. This database can be use to find contact information for GOM proponenets with an interest in the GOM and its watershed (GOMC 2005a).

- NGO Directory

The NGO Directory is an online interactive database with over 650 nongovernmental organizations pursuing the Council's priority issues in the Gulf (GOMC 2005a). The NGO

directory can be used as a communication and research tool to enhance links among nongovernmental organizations. In this way, the directory functions to enhance local and regional capacity for citizen stewardship and to build the capacity of volunteer stewardship programs to protect and restore coastal and marine habitats (GOMC 2002).

Collective strategies

A collective strategy is a method for making, doing, or accomplishing something set up on the principle of collectivism or ownership and production by more than one party (WF 2006).

- RARGOM/GOMOOS/GOMC marine research and monitoring strategy

In the 2001-2006 Action Plan, the GOMC plans to create and implement a marine research and monitoring strategy. To accomplish this, the GOMC will collaborate with others to produce and implement a marine research and monitoring strategy that can respond to pressing environmental management issues and enhance the region's knowledge-based economy. Toward this end, the GOMC will enter into a cooperative agreement with the Regional Association for Research on the Gulf of Maine (RARGOM) and the Gulf of Maine Ocean Observing System (GOMOOS) that articulates how these three organizations will collectively pursue this strategy (GOMC 2002).

- Nature-based tourism strategy

Working in collaboration with tourism agencies, industry providers and conservation interests, the GOMC intends to develop and implement a nature-based tourism strategy that sustains the environment and the well-being of local people. Core elements of this strategy will include voluntary guidelines for tourism providers, a nature-based accreditation system and an alliance that could serve as an organizational voice promoting responsible tourism practices (GOMC 2002).

Media

- Newsletter

The quarterly newspaper, The Gulf of Maine Times is the GOMC's ongoing news source. The Gulf of Maine Times was launched in 1997, as a free quarterly newspaper. It reaches a circulation of 10,000 government officials, non-profit staff, educators, business people, press and other interested readers. The Times offers a wide variety of articles on subjects such as Gulf-related policy, resource management and scientific matters. There is also a column that introduces new ideas and projects, a "Q&A" with noted experts, personality profiles and book reviews (GOMC 2005a).

- Website

The GOMC Web site (http://www.gulfofmaine.org) provides visitors with a range of Gulf-related information and tools. Resources include the "People Finder" and "NGO Directory", a calendar of events, a library of reports, the Gulf of Maine Times, and application information for Council grants and annual awards. This website is a central location for accessing all the work done by GOMC members and proponents in the GOM.

- Published information

The GOMC publishes information for federal, state, provincial and local policy-makers, business leaders, regional organizations and interested citizens on the status and health of significant Gulf habitats, particularly those used by mobile and migratory species. For example, the GOMC Action Plan 2001-2006 outlines efforts to publish information about how contaminants affect

human health and the Gulf of Maine ecosystem. The publication of this type of material encourages the exchange of information among those involved in contaminant monitoring (GOMC 2002).

One type of published information is Fact Sheets. The GOMC has created a wide range of fact sheets, on topics such as regionally significant habitats, ANS and Gulfwatch findings and priority contaminant issues.

- Science translation

In 2002, the GOMC initiated its Science Translation Project. This project accelerates the transfer of scientific findings and techniques to resource managers, planners, policy makers, and other coastal decision-makers in the region. Peter Taylor and Ethan Nedeau are the council's science translators. They gather, synthesize, and communicate information to aid science-based decision-making (GOMC 2005b).

4.1.2 Existing mechanisms for gaining and delivering climate change information

Networks

A network is "an extended group of people with similar interests or concerns who interact and remain in informal contact for mutual assistance or support". (WF 2006)

The following networks are described based on information from various sources. If there is information missing or incorrect, please be prepared to speak about the necessary changes at the meeting.

- C-CIARN

The following was taken directly from the C-CIARN National Website (C-CIARN 2006):

> The Canadian Climate Impacts and Adaptation Research Network (C-CIARN) is a national network that facilitates the generation of new climate change knowledge by bringing researchers together with decision-makers from industry, governments, and non-government organizations to address key issues. C-CIARN provides a collective voice for this community to: improve our knowledge of Canada's vulnerabilities to climate change; identify ways to minimize the negative effects of future impacts; and explore opportunities that take advantage of any positive impacts.
>
> The Canadian Climate Impacts and Adaptation Research Network is comprised of six regions and seven national sectors connecting researchers and stakeholders across the country.
>
> C-CIARN Regions and Sectors work together to increase our understanding of climate change impacts and adaptation; identify knowledge gaps and define research priorities. A national coordination office housed at Natural Resources Canada manages the operation of the Canadian Climate Impacts and Adaptation Research Network.

Many of the mechanisms for gaining and delivering information used by the GOMC are also used within C-CIARN. For example, each C-CIARN office hosts a number of climate change related workshops pertinent to that region/sector. C-CIARN also has a central website, as well as regional/sectoral websites which provide visitors with information about upcoming events/workshops; proceedings from past events/workshops; a climate change research database; links to other relevant sites; training and education opportunities; and other climate change information.

Editor's Note… At the time of the EC-GOM Meeting, C-CIARN was still operating. Subsequent to the Meeting there are indications that Natural Resources Canada (NRCan) will not be funding C-CIARN in Fiscal 2006/07.

- RARGOM

The Regional Association for Research on the Gulf of Maine (RARGOM), founded in 1991, is an association of institutions which have active research interests in the Gulf of Maine and its watershed. RARGOM is presently housed at the University of New Hampshire.

The overarching goals of RARGOM are to, promote and facilitate a program of regional research of scientific quality; and to offer a line of communication between scientists and the public. Its specific objectives include the following (RARGOM 2006):

> To coordinate marine research and monitoring in and around the Gulf of Maine in order to make efficient use of resources.
>
> To facilitate and enhance the availability of research funds and facilities to marine scientists at member institutions through enhanced scientific planning, inter-institutional communication, and other means.
>
> To plan, organize, and implement long range, interdisciplinary research programs on the Gulf of Maine.
>
> To achieve operational economies through pooled inventories of costly supplies, standardization of major equipment items and related documentation, joint planning of equipment acquisition, refurbishment, or maintenance, and sharing of technical support personnel where feasible.
>
> To communicate the need for and results of scientific research on the Gulf of Maine to the user community and to the public at large.
>
> To provide scientific and technical advice and planning for federal, regional, state and local agencies and organizations.

RARGOM works on a smaller scale than C-CIARN in that it addresses issues only in the GOM region. However, its focus is not specifically on climate change. The RARGOM website offers regional research reports; a bibliographic and an institutional database; links to weather and other relevant local sites; and archived materials such as workshop/meeting reports and GOM news.

- NROC

The Northeast Regional Ocean Council (NROC) is a recent creation that stemmed from a meeting of the New England Governor's Conference (NEGC) in August 2005. The meeting included a discussion on oceans policy leading to the NEGC agreement to form NROC. NROC will ultimately make possible the development of more coordinated and collaborative regional goals and priorities and improve responses to regional issues.

Outreach/Action plan

According to the US National Oceanic and Atmospheric Administration (NOAA), outreach is defined as, "two-way communication between the agency and the public to establish and foster mutual understanding, promote public involvement, and influence behaviours, attitudes and actions with the goal of improving the foundations for stewardship" (NOAA 2005).

- "One Tonne Challenge" (formerly CCAF-PEO)

One Tonne Challenge Program

In August 2004, the Canadian federal government announced new initiatives to help Canada meet its climate change goals. Included in the Climate Change Plan for Canada is the One Tonne Challenge, "a multi-facetted public education and outreach program to encourage Canadians to reduce their greenhouse gases emissions by one tonne or 20%" (EC 2004).

Project Green

Along with climate change, the federal government will address a range of environmental issues, including biodiversity, water, contaminated sites and clean air, through Project Green. Project Green is a set of policies and programs aimed at supporting a sustainable environment and a more competitive economy.

Climate Change Action Plan

Moving Forward on Climate Change: A Plan for Honouring our Kyoto Commitment, is Project Green's first instalment, which provides the tools and incentives to secure a healthy environment and a strong, growing economy.

The plan is directed both towards individuals and at industry. At an individual level, the plan involves raising awareness of simple, energy efficient actions to save the environment; contributing to the success of the EnerGuide home retrofit program; and gauging the effectiveness of possible new consumer incentives, through public consultation.

At the industry level, the Action Plan is, "a balanced approach with fair reduction targets to ensure a cleaner environment and economic growth" (EC 2004).

Editor's Note… Due to recent change of government in Canada, the above programs may be under review in the coming months. However, this information is intended to provide background information on current climate change outreach/action plans and is therefore relevant regardless of future changes which may occur.

- USGCRP

The United States Global Climate Research Program

A US national assessment was made of the potential consequences of climate variability and change. This effort, sponsored by the US Global Change Research Program (USGCRP), and has

provided an important opportunity to reach out to the many interested parties, or stakeholders, about the potential significance for them of future changes in climate.

The USGCRP is using a variety of outreach tools to increase public under-standing of the potential consequences of climate change. The USGCRP's Web site is a centre for accurate and useful information on global change. The site also allows a connection between scientists, students and their teachers, government officials, and the general public (USGCRP 2005). The USGCRP also puts out a regular newsletter, *Acclimations*, which provides information about the national assessment to a broad audience.

- NEG-ECP

The Conference of New England Governors and Eastern Canadian Premiers
The Climate Change Action Plan of the NEG-ECP and their respective environment and energy agencies addresses climate change from a mitigation standpoint. This plan supports and complements other regional, state and provincial initiatives currently being implemented and strives also to be consistent with the Canadian National Implementation Strategy for Climate Change.

As part of the action plan, coordinated education and outreach programs for schools, parks, government and all other appropriate media are being developed. The outreach programs will ultimately communicate why the issue of climate change is important to the citizens in the GOM region.

4.2 Tools for information management

4.2.1 GOMC tools for accessing information

Gulfwatch Program

Gulfwatch is the only international monitoring program for chemicals and contaminants in the GOM. Since 1993, it has been organized and administered by the GOMC to measure contaminants in blue mussels (*Mytilus edulis*). The information is used to assess the types and concentration of contaminants in coastal waters of the GOM. Gulfwatch is cooperative effort from scientists and managers of agencies and universities around the GOM and is networked to similar programs such as the NOAA National Status and Trends Program Mussel Watch Project.

As per the GOMC Action Plan 2001-2006, Gulfwatch will be expanded to sample for additional chemicals, testing for contaminant levels in other organisms, conducting toxicity tests, and sampling sediments. While continuing their efforts, Gulfwatch is also adapting to meet the evolving needs of resource managers and surrounding communities, and also being responsive to changes in technology and assessments of the environmental integrity. For example, Gulfwatch is adding bioeffects measures to its regular sampling. GOMC is encouraging research and monitoring partnerships to strengthen mussel monitoring and to utilize other indicators of ecosystem health in the GOM and Bay of Fundy.

Database

A database is a collection of data arranged for ease and speed of search and retrieval (WF 2006).

- Marine habitat restoration database

GOMC and NOAA have developed a regional habitat restoration web portal in an effort to bring together information about restoration projects from the US and Canadian jurisdictions of the GOM (GOMC 2005c).
As well as being home to the restoration database, the portal includes the Gulf of Maine Habitat Restoration Strategy, project vignettes, and general information on identifying, planning, and funding habitat restoration projects within the GOM.

The marine habitat restoration database documents coastal and marine habitat restoration projects and facilitates sharing of successful techniques. It is a geographic module of the National Estuary Restoration Inventory (NERI) and is also accessible through NERI. This will allow GOMC to "leverage NOAA's technical capacity to develop the restoration inventory and provide NOAA with essential restoration data for three New England states and two Canadian provinces" (GOMC 2005c).

- ANS database

A Northeast Aquatic Nuisance Species (NEANS) Panel was established in 2001 to, "protect the marine and freshwater resources of the Northeast from invasive aquatic nuisance species through commitment and cohesive coordinated action". As part of their work, NEANS has contracted with the Marine Invertebrate Diversity Initiative (MIDI) to create the online Marine Invertebrates Database (MarineID). MarineID is a regional database to track the distribution and spread of ANS. The NEANS Panel is working with agencies, nonprofits, researchers, and others to identify appropriate data to populate the database. This database can be accessed through the NEANS website (NEANS 2006).

Coastal/marine habitat mapping

The Gulf of Maine Mapping Initiative (GOMMI) grew out of a 2001 mapping workshop put on by the GOMC and NOAA. GOMMI aims to make mapping information more accessible and useful, and encourage the development of new mapping technologies. It is a U.S.-Canadian partnership of government and non-government organizations to conduct thorough seafloor imaging, mapping, and biological and geological surveys. Currently, GOMMI is working to secure funding and conduct a mapping program of areas in the Gulf of Maine not already covered by multi-beam sonar surveys (GOMMI 2005).

A public-private partnership was established as part of GOMMI to promote development of emerging marine mapping technologies, educate the public about them, and foster their adoption in the public sector.

4.2.2 Existing tools for climate change data management

Monitoring programs

There are a large number of climate monitoring programs that operate on everything from global, national, regional and local scales. The following are a few examples:

- US federal government (NCDC)

The National Climatic Data Center is the world's largest active archive of weather data. NCDC's climate monitoring reports and products are extensive and include climate publications and data

from around the world. They include State of the Climate Reports; Bulletin of American Meteorological Society annual reports; US city temperature and precipitation indices; global climate datasets; drought and snow monitoring information; and recent climatic extremes trends. NCDC supports a three tier national climate services support program within the US. The partners include: NCDC, Regional Climate Centers, and State Climatologists.

- Canadian federal government (EC)

Climate monitoring at the Canadian Federal level is the responsibility of Environment Canada (EC), and includes the observation, recording and analysis of the past and present state of climate based on "proxy" sources of data (such as tree rings and geological records) as well as measurements from systematic climate networks around the world. Only by understanding the past state of the climate and its natural variability can we determine the extent to which climate is changing and whether human activities are fuelling this change. To achieve accurate understanding of the past state of the climate and its natural variability, EC monitors five components of the climate system: atmosphere, oceans, hydrology, land surface and cryosphere.

Canada is a large country with many different climates and types of ecosystems, therefore, a variety of methods are used. This assures the collection of systematic observations, which are assessed for quality and stored for future use. Ongoing monitoring includes the use of "a national network of atmospheric climate observation stations; a network of stations to measure river run-off; an ocean monitoring component (e.g., water temperature and motion); remote sensing (e.g., gathering data by using sensors on satellites) and other technologies; and systems to store and share data collected by federal, provincial and territorial governments and the private sector" (EC 2003).

- Nature watch

The Thousand Eyes Project (http://www.thousandeyes.ca) was initiated by the NS Museum of Natural History in order to build on a wealth of phonological data already in existence in the province.

- IceWatch

IceWatch is a Canadian volunteer-based monitoring program which engages Canadians in accurately recording and analyzing "ice on" and "ice off" events (ice phenology). Many Canadians have kept ice records for years, and even generations. Scientists are using these long-term records of environmental information to study changes in Canadian climate.

- GCOS

The Global Climate Observing System (GCOS) does not directly monitor the climate; it does not make observations or generate data. GCOS, "stimulates, encourages, coordinates and otherwise facilitates the taking of the needed observations by national or international organizations in support of their own requirements as well as of common goals" (GCOS 2005). Other observing systems, such as the Global Ocean Observing System, the Global Terrestrial Observing System, and the Global Observing System and Global Atmospheric Watch of the World Meteorological Organization work in partnership with GCOS. In this way, GCOS provides an operational framework for integrating, and enhancing as needed, other observational systems into a comprehensive system focussed on the requirements for climate issues.

4.3 Form/style/type of information

4.3.1 Environmental indicators

Environment Canada defines environmental indicators as statistics. These statistics must be scientifically credible and representative of an environmental issue. They can help us "to keep track of trends in the state of the environment and measure progress towards sustainable development. They are usually presented as charts, maps or tables with relatively brief text explanations" (EC 2005b).

Environmental health

One of the Gulf of Maine Council's most ambition long term goals is to help identify and track a set of regional environmental indicators and produce a "State of the Gulf" report (GOMC 2005a). This goal will be guided by the GOMC view of the Gulf as a single ecosystem – despite political boundaries – and cross-boundary collaboration for management of the region's regional resources and environmental concerns.

Because environmental indicators can be used to describe the status and trends of natural resources, environmental health, and ecological condition, they help raise awareness of environmental issues. They give scientists and managers a picture of the state of our ecosystems. In this way, indicators of environmental health can inform environmental policy decisions, and serve as a tool for evaluating the effectiveness of management actions.

- ESIP

The Ecosystem Indicator Partnership
ESIP consists of six sub-work groups pertaining to coastal development, contaminants, fisheries, nutrients, aquatic habitats and climate change. The origin of these sub-work groups extends to a GOMC Indicators Workshop in January 2004. ESIP's task is to develop a series of environmental, social and economic indicators for the GOM region.

Climate change

Indicators of climate change include any aspect of nature (e.g. glaciers, sea level) or human activities (e.g. growing crops, heating homes) that are considered sensitive to changes in climate (CCME 2003). Tracking changes of these indicators over time, can give a fairly good picture of how the climate has changed over that same period. Indicators can also bring awareness to changes that affect the daily lives of communities, and the type of response needed.

4.3.2 Mapping Programs

Gulf of Maine Mapping Initiative (GOMMI)

Mapping the GOM 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 non-government 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 multi-beam sonar surveys.

4.3.3 Climate Change GIS Interface

The Climate Change Section (CCs) of the Meteorological Service of Canada and the GIS Mapping Lab of the Environment Stewardship Branch (ESB) Atlantic Region partnered to develop a Climate Change GIS Mapping Interface. The concept for this tool was to provide the user with the capability to access climate change information in a number of ways based on their requirement. At the most basic level, the client can download the climate change information to allow further analysis as they desire. A more effective level is the ability to query the database (constructed by ESB with data from CCS) by site, time slice, parameter, and period, and graphically or in a table, display the results.

The third level is the ability of the client to contour the chosen parameter across the entire region. For example, the client may decide to contour projections of maximum temperature for January for the tri-decade of the 2050s. Such a contouring would then be displayed over a base geographical map of Atlantic Canada and become a "layer", not unlike maps of lakes, roads, rivers, etc already available in other regional databases. Such contoured maps can be used as "layers" in the GIS mapping sense and overlaid with other fields such as landscape (tree species) mapping, turning the contoured map into an effective research tool.

4.4 Discussions, Decisions, Actions

Ongoing discussion at the meeting regarding agenda items 3 (Mechanisms) and 4 (Outreach) led to the following decisions and action items:

Third Agenda Item: Mechanisms

It was generally agreed upon from the start of the mechanisms discussion that a multi-dimensional approach would be needed to effectively address the issue(s) of climate change within the GOM. Currently, the GOM focuses primarily on coastal issues – an approach that is not highly effective for a cross-cutting issue such as climate change. It is important to make links to different geographic regions (inland, coastal, offshore) as well as to social and economic and ecosystem indicators of climate change.

A flow chart was developed prior to the meeting to demonstrate the direction of information through the Climate Change Network (See Appendix C). It was deemed important to avoid developing a research-based mechanism, as significant scientific research already exists in the GOM, and there is no need to duplicate efforts. In this case, reference to "research" in the Climate Change Network flow chart should refer to the process of gathering existing information rather than doing actual scientific research. The meeting participants also recommended looping information from the public, industry and decision makers back to the Climate Change Network. The focus, should be finding a way to use what mechanisms are already in place to get

information dispersed. It was felt that the mechanism(s) does not need to be too complex to get the ball rolling and that it is best to get things moving rather than worrying too much about perfecting the mechanism(s).

The group generally saw the CCNTF as an intermediate step towards a Climate Change Network, which is yet to be defined. The role of the network would be to advise the council on matters relevant to climate change; develop an adaptable process able to monitor information and new developments on climate change and react; help council and internal GOM groups integrate climate change into structure and decision processes; and to some capacity, provide public education and outreach and facilitate public participation. It should be the role of the network to give feed back to the Council regarding the entire watershed ecosystem with regard to climate change.

Fourth Agenda Item: Outreach

Discussion around outreach focused on who needed to be targeted, how, why (outcomes driven vs. process driven approach). There was expressed concern that although information is available, it needs to be more successfully dispersed and that efforts not be replicated unnecessarily. However, it was believed that it is best get people engaged in the process as quickly as possible.

The next question raised was what type of information should be provided to stakeholders. On the one hand, there is a need for absolute science in order to effect change, but it was felt that too much information without key people could be counterproductive. If the general public can understand and relate the notion of climate change and how it can directly affect their lives, then it will be easier to make progress. For example, iconic factors (i.e. beaches) are more easily relayed to the public, especially those who rely on these factors for their livelihood. It was believed that public outreach in terms of ecotourism should be an important component in the information process.

The point was made that it is crucial to get to information out to the citizens who are most directly affected by climate change. Information being provided should also be relevant to the stakeholder groups being targeted. As well, it is important that information from decision makers, public and industry be fed back into the research to create a research loop. A new arrow was added to the Climate Change Network flow chart representing this change. These people seem to be fairly well educated about climate change and realize that there is a need for change, therefore asking these different people/demographics their opinions about climate change and how to best go about the process will create a grassroots approach. If the public outreach and education system created is one that makes politicians feel safe, they will feel confident to instate new, relevant policies.

As for the role of the GOMC, the general conclusion was that the position of the GOMC is to advise and provided information, but not to put forth policy. The group was adamant that climate change inreach should be an ongoing task, and members should be updated annually, as the success of the outreach depends on the GOMC being currently informed of the ongoing changes in climate change research/issues with regards to the GOM.

5. CONCLUSIONS

5.1 Consensus items

5.1.1 The GOMC, as a whole, will…

- Approach climate change issues on a broader scale encompassing:
    a. watershed (inland), coastal and deep water (offshore)
    b. economic, social, environmental, public health, community, etc
    c. GHG/impact mitigation and adaptation

    The participants discussed the importance of addressing climate change in the GOM from an all-inclusive perspective. This means expanding the geographical scope of the GOMC to include the entire watershed from inland through coastal and into deepwater (offshore) areas. As well, this expanded perspective should include attention to economic, social, environmental, public heath and community spheres. The issue of climate change should be addressed both from a mitigation and adaptation standpoint. The GOMC should pay attention to both climate change prevention (GHG reduction) as well as solving problems associated with projected impacts.

- Identify climate change issues based on this broader scale and prioritize based on relevance to GOM

    The meeting participants discussed and agreed that climate change issues should be identified as they pertain to inland, coastal and offshore geographic regions; economic social, environmental, etc spheres; and mitigation and adaptation strategies. Upon identification of the broad scale issues, a process should occur to prioritize these issues based on their relevance to the GOMC mandate.

- Treat climate change issues as cross-cutting

    The participants recognized that climate change is a cross-cutting issue and will impact all aspects of life in the GOM. As mentioned above, climate change should be approached from a broad perspective both from geographical as well as sectoral point of view. It was agreed that climate change, therefore, should be addressed within all three goals (Ecosystems, Human Health, and Economies) of the GOMC Action Plan and not limited to any one area of effort.

5.1.2 The Task Force will take an intermediate role to…

- Refine activities as detailed in approved Action Plan 2006

    The participants recognized that the activities put forward to the GOMC Action Plan were purposefully generic and broad with the expectation that they would be refined at a later date. Upon approval from the GOMWG and GOMC, the Task Force will work to

refine those activities to suit the proposed broader direction. The new, refined activities will be subsequently submitted to the GOM Working Group and Council.

- Research and compile [Who? Where? When? What? Why?] climate change information as identified in the logic model

  Participants acknowledged, as per the outlined activities in the Action Plan, that considerable climate change information needs to be identified, gathered and explained. This process will start with the compilation of sources of relevant climate change information in the GOM region and follow through with the designated topics outline in the Action Plan (e.g. invasive species, coastal habitats and watersheds at risk).

- Deliver information on climate change as identified in the logic model

  One of the activities outlined in the GOMC Action Plan is to deliver climate change information through information sessions/workshops. The information to be presented would be that which has been researched and compiled, as previously mentioned. The goal is to present this information to all relevant stakeholders within the GOM region, including decision-makers, active resource users, regulators, landowners and the general public.

- Develop climate change network as an instrument to advise and inform GOMWG and Council

  The development of a climate change network is an activity outlined in the GOMC Action Plan. The participants agreed that this was a necessary step for the GOMC to effectively address climate change issues in the region.

5.1.3 The network will…

- Advise the Working Group and Council [on matters relevant to climate change]

  The participants saw that a primary role of the network would be to bring information and advice to the working group council. For example, the network will facilitate the reworking of the activities, outcomes and goals of the GOMC to reflect the new, broader scale perspective proposed above.

- Develop an adaptable process able to monitor information and new developments [on climate change] and react

  Meeting participants agreed that climate change information exchange within the GOM (between GOMC and stakeholders) be two-sided. Participants decided that re-evaluation and re-introduction should be part of an ongoing feedback process to fulfill the short-, medium and long-term goals of the GOMC. For example, information to resource users should flow both to and from individuals and reported/relayed back to council.

- Play a role in helping council and internal GOM groups integrate climate change into structure and decision processes

  Participants agreed that the network would play a significant role in providing relevant climate change information to council and internal GOM groups to ensure effective decision-making and structural changes within the GOMC. Upon completion of several of the above items (including broadening of the scope and refining of action items), the climate change network will be in a position to advise the Council and Working Groups as to the most valuable management for effecting change within the GOM.

- Play a role in providing public education and outreach and facilitate public participation

  Participants discussed and agreed that the climate change network could play an important role in providing education and outreach. Public outreach and education to facilitate public participation could include delivering workshops or information sessions to stakeholders on climate change related topics such as climate change impacts to ecotourism, fisheries and regionally significant coastal habitats.

5.2 Recommendations to Working Group

It is recommended that the Gulf of Maine Working Group

- Approve the process for framing activities for council approval, i.e have climate change network prioritize issues and bring forward suggestions/recommendations to working group and council.

  Participants in the EC-GOM Meeting recommend that the GOMWG approve the process for framing activities for GOMC approval. That process includes prioritizing climate change issues through an established climate change network and having the network bring forward suggestions and recommendations. This would require an approval step through the GOMWG before items go to Council.

- Approve and support intermediate steps agreed to at the meeting
  - delivery on activities and products detailed in the Action Plan 2006
  - development of network

  Participants in the EC-GOM Meeting recommend that GOMWG approve and support the intermediate steps agreed to at the meeting. This approach includes developing and delivering on climate change activities and products as defined in the approved Action Plan 2006 and develop a climate change network to carry the Task Force work forward.

- Bring recommendations to council

  Participants in the EC-GOM Meeting recommend that GOMWG bring these recommendations forward to Council.

6. ADDITIONAL RESOURCES

If you have any questions or additions/comments regarding this report, please contact Philana Dollin, Research Associate, Climate Change Section, Environment Canada – Atlantic, 45 Alderney Dr, Dartmouth, NS B2Y 2N6, Philana.Dollin@ec.gc.ca, Tel: 902-426-6342

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APPENDIX A – MEETING AGENDA

ENVIRONMENT CANADA & GULF OF MAINE COUNCIL
CLIMATE CHANGE MEETING
-AGENDA-

Both days' sessions will take place in Room 1524 of the Environment Canada Queen Square Office Building, Dartmouth, N.S. (see the Useful Information page for directions). See the Discussion paper (Parts 1-3) for more information about the specific subjects being covered.

CURRENT KNOWLEDGE
DAY ONE: Wednesday March 22, 2006

9:30am- 9:45am	Welcome and introduction to the goals of the workshop • Participant introductions
9:45am- 9:55am	Review of discussion paper #1
9:55am- 10:30am	Introduce and start roundtable discussion on climate change issues in GOM: • What are the issues in the GOM? • Are there any issues missing from the list in paper #1?
10:30am- 10:50am	Break
10:50am- 11:50am	Continue roundtable discussion
11:50am- 12:15pm	Introduce and start roundtable discussion on climate change information in GOM: • How much do we know? • Is there information available for each of the issues?
12:15pm- 1:15pm	Lunch (provided)
1:15pm- 2:15pm	Continue roundtable discussion
2:15pm- 2:30pm	Identify information gaps
2:30pm- 2:50pm	Break
2:50pm- 3:40pm	Achieve consensus • This may include identification of priority research items and prioritization of issues
3:40pm- 4:00pm	Meeting wrap up • Reminder of tomorrow's agenda

FUTURE INFORMATION MANAGEMENT MECHANISMS
DAY TWO: Thursday March 23, 2006

8:30am- 8:40am	Welcome back • Hand out printed summary yesterday's work
8:40am- 9:00am	Review of discussion paper #2
9:00am- 9:45am	Introduce and start roundtable discussion on climate change information mechanisms in GOM: • Are there any mechanisms missing from the list in paper #2?
9:45am- 10:05am	Break
10:05am- 10:30am	Continue roundtable discussion
10:30am- 11:30am	Introduce and start roundtable discussion on climate change future climate change mechanisms in GOM: • How should climate change information be gained and distributed in the GOM? • What mechanisms or combination of mechanisms should be used?
11:30pm- 12:30pm	Lunch (provided)
12:30pm- 1:15pm	Continuation and wrap up of future climate change mechanisms discussion
1:15pm- 1:20pm	Introduce outreach plan exercise and divide into breakout groups
1:20pm- 1:45pm	Work in break out groups on outreach plan
1:45pm- 2:00pm	Break
2:00pm- 2:35pm	Wrap up and present break out group results
2:35pm- 2:45pm	Meeting wrap up

APPENDIX B – CLIMATE CHANGE IMPACTS IN THE GOM

1. Climate change impacts on ecosystems and wildlife in the GOM

The items under this section correspond generally to Goal 1 of the GOMC Action plan: the Gulf of Maine ecosystem is healthy (Protect and restore). Note: the underlined item(s) were added upon consensus from the group present at the meeting.

a. Forests
   i. Pollution
      - Ground level ozone
      - Acid rain
   ii. Forest composition
   iii. Invasive species
   iv. Wildlife
   v. Fires
   vi. Soils
   vii. Erosion

b. Lakes and Ponds
   i. Mixing regimes
   ii. Thermal habitat
   iii. Productivity
   iv. Dissolved oxygen
   v. Warmer temperatures
   vi. Reduced lake levels
   vii. Fish migrations
      - Native
      - Non-native

c. Rivers and Streams
   i. Water temperatures
   ii. Dissolved oxygen
   iii. Hydrology
   iv. Riparian zones
   v. Aquatic macroinvertebrate communities
   vi. Fish communities
   vii. Ice and snow cover/melt
   viii. Changes in salinity

d. Estuaries
   i. Sea level rise
   ii. Vertical mixing
   iii. Dissolved oxygen
   iv. River flow and runoff
   v. Nutrient loading
   vi. Contaminant loading

vii. Eelgrass
viii. Diseases and pathogens
ix. Fish communities

e. Salt Marshes
i. Plant productivity
ii. Sea level rise
iii. Freshwater discharge
iv. Coastal storm severity
v. Degradation or loss

f. Coastal Marine
i. Circulation patterns
ii. Temperature
- Water density

iii. Carbonate chemistry
iv. Coastal erosion
v. Storm damage

g. Biodiversity
h. Soils
i. Water budget

2. Climate change impacts on human health in the GOM

The items under this section correspond generally to Goal 2 of the GOMC Action plan: Human health within the Gulf of Maine Watershed is protected. Note: the underlined item(s) were added upon consensus from the group present at the meeting.

a. Health
i. Ozone
ii. High temperature
iii. Water-borne diseases
iv. Extreme weather events
v. Vector-borne diseases
- Lyme disease
- West Nile virus

vi. Environmental refugees

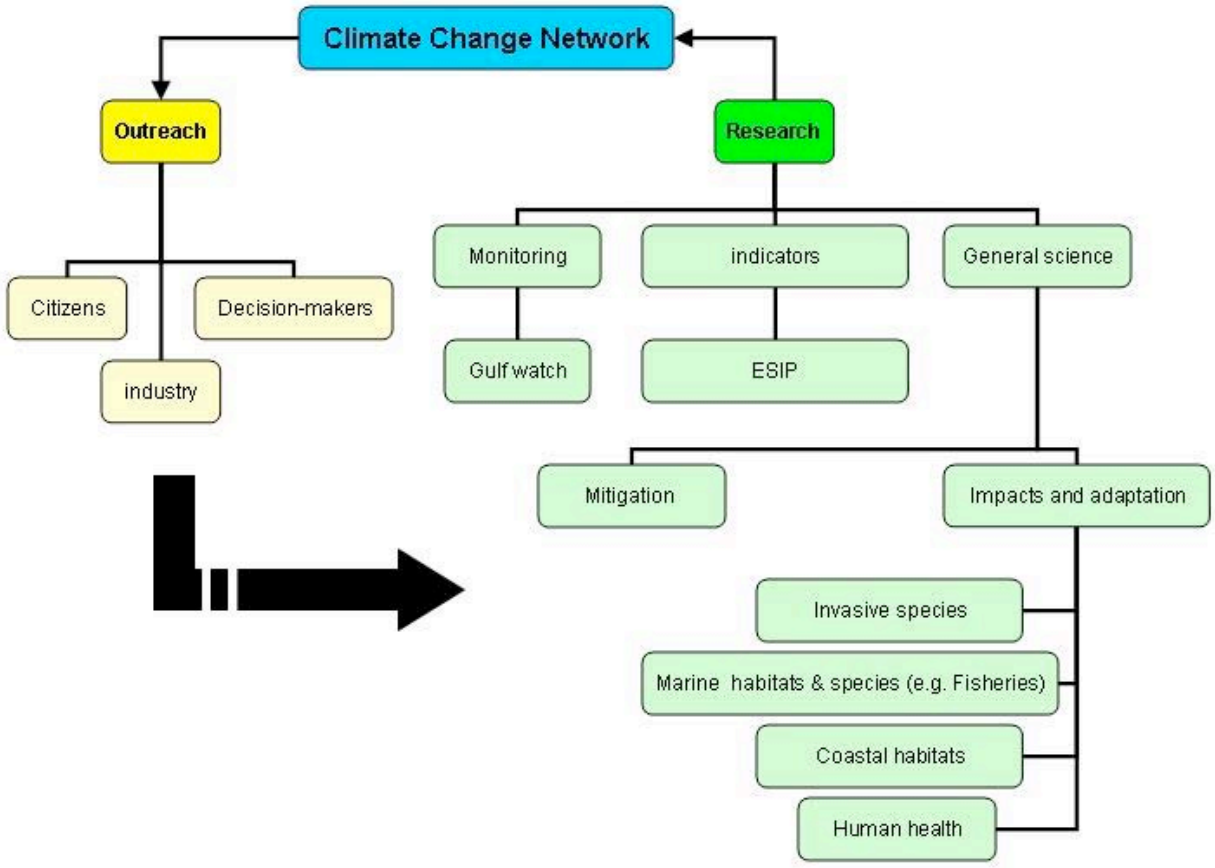
3. Climate change impacts on the GOM economy

The items under this section correspond generally to Goal 3 of the GOMC Action plan: the Gulf of Maine economy is healthy and sustainable. Note: the underlined item(s) were added upon consensus from the group present at the meeting.

a. Economies
    i. Fisheries
        1. Geographic distributions
        2. Migratory/anadromous fish
        3. Freshwater fisheries
        4. Saltwater fisheries
        5. Aquaculture
    ii. Agriculture
    iii. Forestry
        - Forest productivity
        - Forest damage
    iv. Tourism
        - Fall foliage
        - Extended season
        - Extreme weather
    v. Insurance
    vi. Real estate
    vii. Municipal infrastructure
    viii. Invasive species

APPENDIX C – Climate Change Network flow chart

Flow chart developed to indicate the direction of information through the Climate Change Network. The thick black arrow was added as a result of discussion during the March 22-23 meeting.



APPENDIX D – Meeting evaluation

Evaluation for EC-GOMC Climate Change Meeting

4. Please asses the meeting using the guide below

How satisfied are you…	Very Satisfied	Satisfied	Neutral	Dissatisfied
With the quality of the overall meeting	2	2		
With the scope of the information covered	2	2		
With the usefulness of the information	2	1	1	
That you had sufficient time to network	2	1	1	
With the amount of time dedicated for the discussions	2	2		
With the meeting's overall value in providing you with information you can put to use	3	1		

5. What topics are of interest to you and applicable to your work that were NOT covered at the meeting?

Excellent start
Process of moving forward in a structured way using and integrated process
None

6. Other comments and suggestions for this meeting or future meetings?

Great food! Nice facility. Great opportunity.
Great food.
Excellent food/drinks
I enjoyed the lunches

APPENDIX E – Meeting Minutes for March 22, 2006

Attendance: Bill **B**urtis (Clean Air Cool Planet), **J**ohn **C**oon (UNH Dept. of Natural Resources), **P**hilana **D**ollin (EC), ***G**eorge **F**oote (NS Dept. of Energy), **M**ichael **F**uller (EC – Secretary), **L**arry **H**ildebrand (EC), **D**ean **M**undee (NB Dept. of the Environment), **G**ary **L**ines (EC),

9:33 am – **Meeting commenced**.

GL (chair) – Introduced Bill Applebee (Director of Meteorological Service of Canada, Atlantic Operations)

BA – Addressed the group and spoke briefly about the importance of the GOM as an ecosystem. Suggested that *planning* and *awareness* are the fundamental components needed to preserve and GOM ecosystem.

GL – Introduced climate change into the discussion and addressed several key items of concern, the relevant topics of discussion, and the general goals of the meeting:

Key items of concern:

1. What we know & what we do not know?
2. Acknowledged the availability of funding.
3. Big picture. Focus of meeting?
4. How can we move ahead?

Topics of discussion:

1. Climate change in the GOM.
2. Other important issues concerning the GOM.
3. What specific outreach can be done to inform people of the issues at hand?

General Goals of meeting:

a. To create a solid idea of the issues concerning the preservation of the GOM.
b. How best can the information dispersed to various parties?

LH – Informed the group that he had attended the most recent GOMC meeting St. Andrews, NB. Noted that the action plan is behind schedule but well in the works and that *climate change* is major feature in the schedule. Assured the group that there is still time to reshape and change the action plan with regards to climate change.

9:51 – Introductions – each member of the group introduced themselves

GL -Introduced climate change from an impact point of view.

Raised questions:

- Are the given issues the most pertinent?
- What other issues could be included in the list?

LH – Felt that it is important for people (especially those whose lives are directly impacted by the GOM ecosystem) to be informed.

Raised Questions:

- What is the immediacy of these actions?
- Is climate change serious under the circumstances?

BB - Questioned the physical impact of climate change concerning coastal areas. Stated that this should be viewed as a major concern, especially with regard to unavoidable rise in sea level. Stressed that immediate action is crucial in order to ensure the preservation of the GOM ecosystem. Felt *wetlands* should be made a priority within the action plan.

GL – Confirmed the importance of "immediate action." Agreed that it was best get people engaged in the process as quickly as possible. Acknowledged the necessity to educate those people whose lives are directly affected by the GOM ecosystem.

Raised Question:

- How much outreach is worthwhile?

JC – Felt that a more general plan is needed. Stressed that is necessary to educate people about climate change. Introduced a concern that certain organizations do not have the ability to work out side of their jurisdiction. Thinks *biodiversity* is a major factor with regards to the GOM ecosystem and that it should be added to the list of climate change impacts.

Raised Question:

- Can flora and fauna in the GOM and surrounding areas survive climate change (coastal, inland and offshore)?

BB – Stressed the importance of entire GOM watershed (MA, NH, ME, NB, NS) and suggested that CO2 should be recognized as potential contaminate.

Raised Question:

- How can increases in CO2 affect the surrounding ecosystem? (i.e. St. John River)?

DM – Questioned the specific outcomes of the GOMC and wondered how this is going to be accomplished. Suggested that we should ask questions first then figure out the plan. Stressed that better *climate models* are crucial in order to take the next step. Felt that efforts should be made to inform people about the climate change and allow them to realize that there is definite need for change. Felt we should ask different people/demographics their opinions about the best way to go about dealing with climate change. Felt working from the ground up is the best method of action.

GL – Acknowledged that information is available but needs to be more successfully dispersed. Stressed the importance of accuracy because of the impact it can have on people in coastal and inland regions. Acknowledged that there are scientific gaps. Suggested that changes in watershed levels due to climate change is a crucial topic and needs to be addressed. Suggested that the group retrace and reevaluate to prioritize topics of importance.

BB - Felt that all parties need to be involved, though perhaps they should meet separately (i.e. loggers, fisherman), as issues of concern are vastly different.

JC - Suggested that some parties would show a resistance to issues of climate change because it is not their area of expertise. Felt too much information without key people could be counterproductive. Believed absolute science is necessary in order to produce the most effect.

Raised Question:

- How do factors of climate change (i.e. increased rain fall) affect all industries involved?

BB – Envisioned a different approach. Concerned about contaminants being unleashed by climate change.

Raised Question:

- Can contaminants that can travel from watersheds to coastal regions as a result of climate change?

10:43 – **Break**

11:06 – Meeting resumed

GL – Introduced the question of the impact of climate change on human health in the GOM areas.

BB – Feels that climate has more of a role on *human health* than we tend to give credit.

GL – Suggested that water quality, as opposed to air quality, has been the major focus this far.

Summary of ideas that need to added to the Action Plan:

- *Ecosystem management:* getting information to those who are impacted and how do we get this information out.
- *Restoration and coastal management:* for wetlands.
- *Biodiversity*
- *Watershed:* impact from extreme weather
- *Contaminants:* as a result of climate change.

GL – Referred to a study of sea temperature (by Environment Canada and UNH) in the GOM which is currently scheduled to be completed by June 2006. Acknowledged that this study could be seen as valuable information/too/indicator used to determine the effects of climate change in the GOM.

DM – Agreed that indicators have great importance. Talked about environmental information vs. economic information vs. social information. Suggested that *databases* containing various indicators should be available for cross-reference.

GL – Agreed that it was impossible to go forward without scientific indicators.

BB – Felt the information has to make sense to the general public; *if the general public can relate the ideas then progress can be made*.

BB – Felt that the study should be an ongoing project, updated annually. Suggested that the only way for this work to be affective is to be currently informed of the changes that are ongoing.

GL – Felt that climate change with regards the GOM should be short term. Short-term vs. mid-term vs. long term.

Referred to Goal 1:

- **Gulf of Maine Marine Ecosystem is Healthy** (powerpoint). Stressed that is crucial to help guide the GOMC move in the right direction to ensure the greatest protection to the GoM ecosystem.

Raised Questions:

- Is this approach appropriate?
- Is the model affective?
- Should changes be made to the model?

BB – Reiterated his concern that GOM watershed be major component of the model to help guide the GOMC.

Reminder! Goals of GOMC

1. GOM ecosystem is healthy
2. Environmental Conditions in GOM support optimum human health
3. GOM economics are Healthy & Sustainable.

DM – Felt we should be careful not to overlap the work done by different groups in the network, as this would only be counterproductive.

BB – Believed that public outreach in terms of ecotourism is a factor. Mentioned iconic factors (i.e. beaches) are items easily relate to by the general public, especially those who rely on these factors for their livelihoods.

LH – Felt that that it is crucial to focus on the economies directly affected by climate change. Since time is an issue (five year plan) it is necessary to have focus.

GL – Stressed the need to clarify the broader issues in terms of climate change the GOW.

Raised Question:

- Are there any other issues that can be included to make the next several years in this process more affective?

DM – Suggested that Goal 3 (GOM Economics are Healthy & Sustainable) needed to be clarified. Felt that energy should not be the driving factor.

Raised Question:

- Why are there not more factors at the forefront of this mandate?

JC – Felt that the focus should not be on one component issue; rather it should be on the integrity of the ecosystem. Believed that it is important to look at the bigger picture.

GL – Stated that it would be best to provide the MOWC with the simplest, yet most effective action plan possible.

12:25 – Lunch

***G**eorge **F**oote – Dept. of Energy, NS joined the meeting

1:39 – Meeting resumed

GL – Reviewed ideas of morning discussion.

DM – Felt that it was not constructive to bring CO_2 into the equation.

BB – Agreed, but felt that it *is* important that the levels of CO_2 remain at low levels.

GF – Reiterated the need to maintain databases of information to so that climate change can be monitored over time.

GL – Felt that historical information is important but recognized something of greater importance might be to establish more indicators for future evaluation.

GF – *Raised Question:*

- How do we make the information and conclusions generated from climate change indicators resonate at the political level?

GL – *Raised Question:*

- Is it the role to GOMC to recommend policy?

Believed they should be solely a provider of information through indicator data.

GF – Felt that the GOMC should take a step further in order raise levels of causality. Felt that it is important, in terms of policy making, to ask what is creating climate change.

JC – Raised the ideas that there is a level of uncertainty to predicting climate change. Stipulated that trends do have significance.

Raised ideas:

1. Bound the **Uncertainty**!
2. Recognize or predict surprise factors (LOOK TO SCIENCE). Suggested that there needs to be middle ground. Balance surprise: Magnitude vs. Probability.

GF – *Raised Question***:**

- How do you build awareness to the point that people can decide and make policies?

Felt that the education needs to produce motivation.

BB – *Raised Question*s:

- How much information or indication do we need to go ahead with new beneficial policy?
- What is the tipping point?
- How do we know when to take the science and make it into policy?

GL – *Raised Question*:

- Do we have the information?
- Have we identified gaps in information/indicators?

Stated the bottom line is that they logic chart points the system in the right direction.

- What specifically needs to be improved?

BB – *Raised Question:*

- What are the relevant reduction strategies?

GF – Acknowledged that mitigation does exist.

JC – Suggested that in order for information distribution to be effective it has to be universal.

GL – Felt that the main role of the network is to develop, package, and deliver information. Acknowledged that there is a definite division between education and the implementation of policy. Introduced the topic of **Future Information Management Mechanisms** (from Background Discussion Paper Part 2) to the discussion.

Questions Raised by Group:

- What are mechanisms or systems exist that can currently aid in the distribution to information about the GOM?
- Are there enough mechanisms already in place or is does something a new mechanisms have to be created from scratch?

BB – Felt that mechanisms currently in place are *internal* mechanisms and not readily suitable for the general public.

GL – Opined that it is important to use what is currently in existence before spending time and money creating new mechanisms. Concerned that the council should be careful of "out of control expectations."

Raised Question:

- To what level of complexity do we make these mechanisms?

Agreed that a general database is required in order to effectively evaluate climate change in the GOM.

Raised Question:

- Should this information be available to the general public or only specific parties?

BB – Felt that the kind of public outreach and education system that has to be created is one that makes politicians feel safe. If they feel safe they will feel confident to instate new policies.

JC – In reference to Climate Change Network diagram, felt that the Citizens and Decision-makers need to have a direct role in not just the *outreach* but also in the *research* aspects of the system.

DM – Addressed the idea that not all aspects of climate change are bad. Felt the need to implement the positive aspect of climate change into chart.

GL – Addressed the fact there is no real existing mechanism that can be use to gather, package and deliver information pertaining to the climate change in the area of the GOM.

GF – Suggested that there is a need to create a plan that will flow into other aspects of government; a more universal plan since climate change is a worldwide issue.

3:15 – Break

3:28 – Meeting resumed

Group compiled list of additions/suggestions/questions to revise the list of climate change impacts from **Background Discussion Paper Part 1: Current Knowledge** (See Appendix B).

Suggested changes:

- Under the forest category it may be good to look at forest fires, erosion and draughts.
- Possibly add "soils" category to list.
- Ice and snowmelt and how it impacts and flows as well as river and streambeds. What are the objectives to quantify these categories?
- Saltwater intrusion? Salt front effecting communities drinking water source
- "Lake water levels" decreases as well as increases.
- Increase of "invasive species" in the marine environment.
- Human Health???
- Human refugees.
- #5 Economics.
  Topic to discuss: Insurance, real estate and municipal infrastructure.

3: 55 – Meeting adjourned

APPENDIX F – Meeting Minutes for March 23, 2006

(Meeting continued)

Attendance: Bill **B**urtis (Clean Air Cool Planet), **J**ohn **C**oon (UNH Dept. of Natural Resources), **P**hilana **D**ollin (EC), **M**ichael **F**uller (EC – Secretary) **L**arry **H**ildebrand (EC), **G**ary **L**ines (EC), **D**ean **M**undee (NB Dept. of Environment), **K**athryn **P**arlee (C-CIARN Coastal Zone), ***S**teve **S**zabo (EC)

9:08 – Meeting commenced

GL – Welcomed everyone in the group back to the discussion. Reintroduced **Background Discussion Paper Part 2: Future Information Management and Mechanisms**.

KP – described the mandates of C-CIARN, but announced that all funding for C-CIARN with be terminated in the near future.

GL – Stressed the need to find an efficient way to get the information about climate change into the hands of the GOMC. Addressed that there are several mechanisms already in place that could be used to carry out this task. Addressed the fact that many projects are currently in the works to gather indicators in the GOM.

Raised Question:

- What is the best way to go carry out this task?

KP – Spoke about NRCAN's three-year program, mapping regions in the GOM and the Bay of Fundy. Stated that this information would be and excellent tool/indicator to analyze climate change in the GOM.

BB – Suggested that a fundamental core network between various groups (e.g. RARGOM, CCIARN) is necessary in order to effectively provide information to the GOM.

GL – Expressed sentiment that we should be finding a way to use mechanisms already in place to get information dispersed. Added that reinventing the mechanisms would be an inefficient approach.

JC – Offered to provide notes from future meeting with RARGOM, which he thought could be helpful with regards refining the action plan.

BB – Suggested that there was an essential need for certain groups to form better relationships with the GOMC.

JC – Felt that Environment Canada has to be structured properly in order to deal with RARGOM and ensure that outreach is successful. Felt that mechanisms do not need to be too complex to get the ball rolling. Stated that it is best to get things moving rather than worry too much about perfecting the mechanism.

KP – Suggested that ACZISC (Atlantic Coastal Zone Information Steering Committee) would be an excellent program to unite with and could potentially provide the network with useful information.

GL – Referred to ACZISC as an "information clearing house" and agreed that it would be a valuable source of information. Reintroduced activities reports. Suggested that there has to be mechanisms put in place to facilitate and complete the work compiled in the Activities List.

9:50 – Break

10:00 – Meeting resumed

GL – Continued discussion topic on mechanisms and clarified that a mechanism must be in place in order for the activities in the Action Plan to be achieved.

DM – Felt that it would be useful to recognize that deep ocean vs. coastal would have different responses. Suggested that a multi dimensional approach might be needed. Stated, "It has to real," in terms of a timeline to make it possible so people can easily understand the mandate being presented. Felt that it is important to make links to social and economic indicators.

GL – Felt that there has already been priority setting by the GOMC, but the priorities are still broad. In specific reference to the GOMC, said there are a several ways to approach the process.

Raised Questions

- What is the best way to achieve the goals of the Action Plan?
- Is the AC ready to propose a mechanism to the GOMC to serve for the next five years to achieve their goals?
- Are we ready now? Or is it best to get the ball rolling and evolve along the way?

DM – Suggested that the key issue is to prioritize the items on the Action Plan.

GL – Mentioned there is no problem acquiring indicators. Suggested that it is important to create a group that can translate information and provide it to the GOMC in a fashion that will allow them to move ahead with their mandate most efficiently.

Raised Question:

- Who is this group going to be?
- Is the group going to be responsible for presenting the action plan in way that will help guide the GOMC?

BB – Felt that is crucial to review the list to make sure that there is data available for each category.

KP – Suggested that the group might consider focusing their attention on forming a climate change committee.

GL – Felt that it was important to avoid becoming a research based committee, since significant scientific research already exists. Stated working directly with other organizations is good but there has to be a focus on the GOM. Addressed that it is important not repeat work that has already been done by other organizations. Suggested the best possible situation is to create an organization that works specifically to aid the GOMC, allowing them to achieve their goals with respect to climate change. Suggested the possible downside would be to create an organization that is too bureaucratically heavy to get anything done.

JC – Stated that the job at hand should be to put something on the table (a tangible mechanism that can get the job done).

Raised Question:

- How much responsibility should his organization have?

BB – Felt it would be necessary to anticipate questions from the council in order to make certain that the plan devised can go ahead with as much ease as possible. Felt that all mechanisms should be related to climate change. Stated that it should be the role of the network to give feedback to the council regarding the entire watershed regarding climate change.

GL – Agreed that climate change is directly related to each facet of the ecosystem.

Acknowledged several items of importance and concern:

- Within Environment Canada (EC) there has been an interest in wind power.
- EC has a specific wildlife mandate.
- The number one role of the group should be to inform the GOMC of the effects of climate change on the GOM ecosystem

BB – Stated that he was unsure of exactly what kind of group is needed. Was also unsure about specific tasks the Council should take up regarding climate change. Felt that there needs to be further inspection by the Council to identify the gaps that exist within the system. Suggested that realizing the gaps more clearly will show us where assistance is needed. Felt that it is crucial to get the network moving.

GL – Acknowledged that the capacity to form the network already exists.

Raised Question:

- Are all the components in place within the network on both sides of the border?

BB – Felt certain that the first 4 activities can be accomplished with funding by the network. Felt certain that the capabilities of the network should be proven first; only then should the Council decide if they need to provide more assistance to allow them to achieve their goals. Felt that it was important to clearly identify the role of the network.

JC – Was confident that enough scientific information/indicators already exist to guide the Council. Acknowledged that the network should take an advisory role and that the network should also be composed of a well-rounded selection of groups (NGO's, Research institutions, etc.)

DM – Agreed that it is important to clearly define the role of the network and to define what exactly "advising the council" means. Was also concerned how the various interfaces in the action plan will connect.

GL – Acknowledged that it is really the decision of the GOMC to decide how much input they want. Also felt that is the job of the GOMC to determine the relevancy and usefulness of the assistance that is provided.

Raised Question:

- How do we get to the point where everyone is looking at all of the issues in terms of climate change?

JC – Introduced the topic of invasive species to the discussion. Acknowledged that is not just an issue about invasive species but rather a change in the species composition. Stressed that we need to know if this is a good or bad thing. Acknowledged that not all invasive species are necessarily bad or harmful to the ecosystem. Stressed that it is important to find how to go about obtaining this information.

11:55 – Lunch

12:57 – Meeting resumed.

Group Compiles list of Suggestions and Recommendations from ongoing discussion.

Overview of Suggestions and Recommendations:

- Approach climate change issues on a broader scale to include the GOM watershed.
- Identify climate change impacts and prioritize these impacts with relevance to GOM.
- Treat climate change issues as "cross cutting."
- Research and compile climate change information as identified in the logic model.
- Develop climate change network as an instrument to advise and inform the GOMC.
- Provide public education and outreach.
- Assist internal GOM groups integrate climate change into the decision making process.
- Develop process to inform or reintroduce climate change information as part of measurement/evaluation loop.

Recommendations to Working Group:

- Approve approach suggested from meeting
- Support delivery on activities and products from logic model.
- Further support development from the network.
- Bring recommendations to council.

***S**teve **S**zabo (Head of the Climate Change Unit – Environment Canada) joined the meeting.

SS – Asked whether or not the group had addressed the topic of energy (i.e. tidal power, LNG, wind power) in the discussion.

GL – Stressed that there is a definite line between informing and advocating.

DM – Suggested that more of a process piece needs to be added to the agenda to establish a network that allows end results to be achieved.

BB – Brought up the concern of who was going to be responsible for carrying out the various tasks and obligations on the United States side of the border.

GL – Referred back to the list of recommendations and confirmed that the list is not a finalized document (open for revision). Encouraged members of the meeting to make additions to the list if needed. Stated his opinion that the meeting had been a success despite low attendance.

The group agreed that the list had been improved but needed to be "fleshed out" with more detail to further clarify the major points.

1:56 – Meeting adjourned