MARINE MAMMAL COMMISSION

12 October 2010

Ms. Emily Cloyd
U.S. Global Change Research Program
1717 Pennsylvania Avenue, NW, Suite 250
Washington, DC 20006

Dear Ms. Cloyd:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the 7 September 2010 *Federal Register* notice published by the U.S. Global Change Research Program with regard to the next National Climate Assessment. The Commission was established under Title II of the Marine Mammal Protection Act of 1972, which has as its primary objective the maintenance of the health and stability of the marine ecosystem. The Commission advises federal agencies and Congress on matters pertaining to marine mammals and the ecosystems of which they are a part. The Commission's broad scope includes marine mammals occurring in domestic, foreign, and international waters. In addition, the Act directs the Commission to pay particular attention to Indians, Eskimos, and Aleuts, whose livelihoods may be affected adversely by actions taken pursuant to the Act. It is with this background that the Marine Mammal Commission provides the following recommendations and rationale regarding the next National Climate Assessment.

RECOMMENDATIONS

The Marine Mammal Commission recommends that the Global Change Research Program—

- solicit assistance from existing assessment networks such as those already developed by federal agencies, and also consider how it might integrate its assessment efforts with regional networks intended to implement the new ocean policy;
- pay particular attention to the changes wrought by climate disruption on Alaska Natives;
- establish a clear set of priorities and develop strategies to ensure that those priorities will be met before lesser concerns are addressed;
- more clearly define the roles it will play as coordinator of assessment efforts, determine the resources needed to perform those functions, and develop a management strategy to ensure that it is able to function as required;
- engage as many partners as possible in the National Climate Assessment with the aim of supplementing the Program's resources and building future capacity;
- recast its objectives to be more inclusive of other forms of life and to recognize more fully the all encompassing nature of the threats posed by climate disruption;
- provide opportunities for all interested stakeholders to participate in problem assessment and resolution, distribute responsibility for problem resolution in a manner that reflects the cause(s) or source(s) of the problem, and ensure that government agencies represent the

- interests of those who depend on their elected officials and government employees to address climate disruption;
- describe what we know about the capacity of other species to adapt and our limited ability to mitigate the effects of climate disruption on them;
- include a section in its assessment that integrates the identified sectors to show how they are related and interdependent;
- give greater emphasis to the oceans as a sector or region to be considered in greater detail in the National Climate Assessment;
- take advantage of existing and developing databases, observing systems, and traditional ecological knowledge to avoid redundancy and strengthen the information brought to bear on the National Climate Assessment; and
- include a description of population viability analysis and its potential utility in the National Climate Assessment.

RATIONALE

Climate disruption will have profound effects on marine ecosystems, including marine mammals. The effects are expected to be most severe in polar regions, where seasonal loss of sea ice is drastically altering the physical environment and, as a consequence, the biological communities that heretofore have depended on the ice. But climate disruption likely will have profound effects at low latitudes as well. There, warming and acidification may completely disrupt the base of the oceans' food webs and the rising sea level may completely inundate low-lying islands and coastal areas. And we should expect the unexpected. Virtually every major manifestation of the earth's changing climate has been announced with an element of surprise, and there is no reason to assume that those surprises will end any time soon.

Assessing all the changes that will occur as a result of climate disruption is not possible – those effects may be ubiquitous but will vary in nature and severity over space and time. For that reason, the Commission believes that the National Climate Assessment will need to be sharply focused on those matters which are most important to our social and economic well-being, but also on those matters most important to the protection and conservation of our natural environment, which ultimately are connected to our social and economic well-being. In almost all aspects of assessment, investigators likely will have to depend heavily on the use of various indicators or metrics of social, economic, or ecological disruption. In this regard, the Commission believes that the status of marine mammal populations constitutes a valuable indicator, albeit one of many that will be needed, of the health and stability of marine ecosystems.

Objectives

The Commission supports the assessment's key objectives, and makes the following comments.

Objective 1: The Commission concurs with the objective of developing regional networks across the country to sustain the assessment process. This format has been used successfully in resource agencies that have divisions in various regions across the country. Regional networks will play an important part in implementation of the President's new ocean policy, which provides an important opportunity for integrating ocean and climate-related issues and assessments. With the value of such integration in mind, the Marine Mammal Commission recommends that the Global Change Research Program solicit assistance from existing assessment networks such as those already developed by federal agencies, and also consider how it might integrate its assessment efforts with regional networks intended to implement the new ocean policy.

Objective 2: The second objective is to examine the integrated effects of climate disruption on ecosystems and ecosystem services, social and economic systems, and American civil society and institutions. This will be a colossal undertaking and it will be essential to focus on key social groups, economic systems, and institutions to examine such changes in detail. Arctic Natives warrant consideration in any study of climate effects on social groups. They likely comprise one of the groups of people that will be most severely affected by climate disruption, despite the fact that they are geographically isolated from the human activities that are causing or contributing to disruption of the climate. Their livelihoods, traditions, and cultures are at stake and, like their coastal communities, may be rapidly eroded by changing physical and ecological conditions in the Arctic. Therefore, the Marine Mammal Commission recommends that the Global Change Research Program pay particular attention to the changes wrought by climate disruption on Alaska Natives.

Objective 3: The third objective involves nesting of certain investigations depending on regional priorities. The Global Change Research Program must establish priorities whether nesting specific investigations or looking globally at the consequences of climate disruption. It is an unfortunate fact that there simply are not enough resources to conduct all desirable monitoring and assessment tasks. In addition, the effects will vary over space and time, as will the vulnerability of social, economic, and ecological systems. Furthermore, many of the more important assessment tasks will require the development of new assessment capacities, the infrastructure to support those assessments, and long-term data sets carefully focused on key concerns. The failure to identify priority tasks almost surely will undermine the success and utility of the National Climate Assessment. Therefore, the Marine Mammal Commission recommends that the Global Change Research Program establish a clear set of priorities and develop strategies to ensure that those priorities will be met before lesser concerns are addressed.

Objective 4: The fourth objective highlights the need for the Global Change Research Program to act as a central coordinator. In fact, the Program may need to provide a range of central functions, such as establishing assessment standards, overseeing mechanisms for sharing information, identifying and sharing essential expertise, facilitating cross-regional cooperation, and representing the Program and its component parts in interactions with other related programs or nations. To those ends, the Marine Mammal Commission recommends that the Global Change Research Program more clearly define the roles it will play as coordinator of assessment efforts, determine the resources needed to perform those functions, and develop a management strategy to ensure that it is able to function as required.

Objective 5: Objective 5 involves the establishment of partnerships, which will be essential to the success of the National Climate Assessment. Partners should be chosen from all interested segments of society, including federal, state, tribal, and local governments, industry, non-governmental organizations, and academic institutions. Scientific associations may be one of the least tapped organizations for carrying out such assessments but, in many respects, comprise much of our global capacity for doing so. The Society for Marine Mammalogy, for example, has about 2,000 members from many nations and many age groups. It includes older scientists with considerable experience that can be brought to bear on assessment tasks, and younger scientists with new skills, up-to-date knowledge, enthusiasm and energy, and a capacity to conduct assessments well into the future. The Marine Mammal Commission recommends that the Global Change Research Program engage as many partners as possible in the National Climate Assessment with the aim of supplementing the Program's resources and building future capacity.

Objective 6: This objective recognizes the international context of climate trends, but the Commission believes that, in many important ways, this context should be broadened. The oceans comprise 70 percent of the earth's surface and, although a considerable portion of coastal waters have been claimed as the exclusive economic zones of various nations, much of the earth's surface cannot be claimed by any single nation. The oceans will play a critical role in the way climate disruption manifests itself. In the Commission's view, the National Climate Assessment, as described in the subject *Federal Register* notice, does not yet give sufficient attention to the role of the oceans in moderating climate disruption as well as its effects on human activities and resources. Acidification, the increasing frequency of anoxic zones and harmful algal blooms, the degradation of benthic communities such as coral reefs, and the risks posed to ocean productivity itself all suggest that climate disruption is not simply an international issue with implications for the human species, but rather a global issue that may affect virtually all living organisms. To expand the conceptual scope of this effort, the Marine Mammal Commission recommends that the Global Change Research Program recast its objectives to be more inclusive of other forms of life and to recognize more fully the all encompassing nature of the threats posed by climate disruption.

Objective 7: Stakeholder involvement is now recognized as a key ingredient in addressing significant social, economic, and even ecological problems. People must be heard and involved if they are to place confidence in both problem assessment and resolution. In that regard, the Commission has long asserted that those segments of society involved in the creation of a problem should assume a proportionate role in its resolution. In this case, the energy industry should be engaged to ensure that both its expertise and resources are available to help resolve problems related to climate disruption.

An overemphasis on stakeholders also can lead to problems if agencies are guided by vocal stakeholders and fail to represent the interests of a quieter public. With regard to such matters as climate disruption, the agencies must listen to stakeholders but also take into account the concerns of their quieter constituents, many of whom may have strong interests in climate disruption but depend on their governments to speak and act on their behalf. To ensure an inclusive effort to address climate-related problems, the Marine Mammal Commission recommends that the Global Change Research Program provide opportunities for all interested stakeholders to participate in

problem assessment and resolution, distribute responsibility for problem resolution in a manner that reflects the cause(s) or source(s) of the problem, and ensure that government agencies represent the interests of those who depend on their elected officials and government employees to address climate disruption.

Topics

The Commission concurs with the assessment's proposed topics, but encourages the following adjustments and considerations.

Topic II: This topic entails describing the scientific basis for climate disruption, including research on human responses, which it characterizes as "adaptation and mitigation." Indeed, the Federal Register notice seems to use the two concepts of adaptation and mitigation primarily in the context of possible human responses. Adaptation may be a viable response for human societies, but it is not clear that other species will be able to adapt. We have little or no influence over the adaptive responses of non-human species. Managers may be able to facilitate adaptation in limited cases but, for the most part, the fate of non-human species is beyond our control unless we actually address the causes of climate disruption. Beyond that, the primary means of managing such problems is through modification of human behavior. If we fail to address the root causes of climate disruption, we are likely to be left with few options other than to limit our own secondary impacts (i.e., the impacts of shipping, oil and gas operations, etc.) on other species as we wait to see what their fate will be in the face of a rapidly changing climate. With such limitations in mind, the Marine Mammal Commission recommends that the Global Change Research Program describe what we know about the capacity of other species to adapt and our limited ability to mitigate the effects of climate disruption on them.

Topic III: Topic III highlights the use of so-called sectors to characterize the effects of climate disruption. This seems reasonable to a degree, but will not be sufficient. One of the key lessons from recent crises, whether social, economic, or climate-related, is that such sectors are often closely linked and the effects in one have important implications for others. The assessment could be seriously deficient if it did not explore those linkages. In both terrestrial and marine ecology, managers increasingly have emphasized the connections between lands, rivers, lakes, watersheds, coasts, and pelagic environments. To ensure that the various sectors listed in topic III are not viewed in isolation, the Marine Mammal Commission recommends that the Global Change Research Program include a section in its assessment that integrates the identified sectors to show how they are related and interdependent.

Topic IV: Topic IV emphasizes the value of a regional approach to understand the effects of climate disruption. The regions listed vary in many important respects and will vary in their vulnerability to climate disruption. However, for the same reason just mentioned, the Global Change Research Program must go beyond assessment of effects in each region. To provide an overview of the broad-scale impact, the Program will be required to integrate regional effects. Indeed the effects on Arctic ecosystems are best explained by linking those systems to centers of human population and activity thousands of miles away.

The Commission is particularly pleased to see that the Global Change Research Program has included the sector "Arctic" in its list of regions, since Arctic ecosystems will be among the most severely affected. However, as noted in a preceding paragraph, the Commission does not believe that the oceans have been given adequate consideration as a sector or region, especially given their great size, their role in determining climate, and the sensitivity of their biological communities to changes in the oceans' physical properties. In addition, the oceans are of great importance to food production, transportation, national security, energy, and recreation. With the above concerns in mind, the Marine Mammal Commission recommends that the Global Climate Research Program give greater emphasis to the oceans as a sector or region to be considered in greater detail in the National Climate Assessment.

Topic V: This topic is aimed at the kind of integration emphasized in the preceding paragraphs. Here, too, however, the Commission believes that the oceans are of great importance with regard to the integration of climate change effects.

Topic VI: As noted in the preceding comments on Topic II, the Commission is concerned that the concept of adaptation, in particular, is being applied too narrowly, and that it focuses on human adaptation when one of the fundamental issues regarding climate disruption is the ability of non-human species to adapt. Thus, the Commission made the recommendation above for Objective 6 to discuss the concept with regard to non-human species.

Next Steps

With regard to next steps, the Commission has two recommendations.

Knowledge Management, Metadata, and Peer Review: Every effort should be made to take advantage of existing knowledge bases and those that are now under development. Some of the most useful databases for the marine environment have been developed by the National Oceanic and Atmospheric Administration and they include extensive information on certain ecosystem elements such as fish and marine mammals. Also, it seems prudent (if not essential) for the Global Change Research Program to tap into the many ocean observing systems now under development. Doing so will not only provide useful data for the National Climate Assessment, but also give the various observing systems a stronger sense of direction in terms of the data to be collected, analyzed, and stored. Finally, in the Arctic particularly, the Global Change Research Program should work with Alaska Natives to integrate their traditional ecological knowledge into the assessment. Therefore, the Marine Mammal Commission recommends that the Global Change Research Program take advantage of existing and developing databases, observing systems, and traditional ecological knowledge to avoid redundancy and strengthen the information brought to bear on the National Climate Assessment.

Vulnerability Assessments: Methods for assessing vulnerability have been under development for some time and have been applied to assessments of the effects of other types of human activity. Managers are using ecosystem models to address increasingly complex management tasks. However, such models generally have not been validated (demonstrated to be reliable

indicators of ecosystem processes) and therefore inspire less confidence as reliable tools for ecosystem management. They provide useful means of organizing data and identifying data gaps, but whether they provide a sufficient basis for management decisions is still a matter of considerable scientific debate.

Population viability analysis has been used widely to evaluate the risk of extinction for species and populations. Such models integrate information on the species or population of concern and its risk factors and project its status over time. Such analyses provide a basis for decision-making (notably listing under the Endangered Species Act) and for guiding research to address uncertainties. The Commission has evaluated and used this type of analysis and believes that it can be usefully applied when assessing the vulnerability of particular species to climate disruption. As an example, the U.S. Geological Survey recently completed an exemplary analysis for the polar bear to determine whether it warranted listing because of the effects of climate disruption on its habitat. To provide the best possible means for conducting vulnerability assessments, particularly for individual species, the Marine Mammal Commission recommends that the Global Change Research Program include a description of population viability analysis and its potential utility in the National Climate Assessment.

Thank you for the opportunity to comment on your National Climate Assessment. Please contact me if you have questions regarding our recommendations or comments. Also, please note that the Marine Mammal Commission has sponsored a number of projects related to assessment of marine mammals in the Arctic. We would be very happy to provide reports of those projects to you and/or provide assistance to the Global Change Research Program on that topic.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director