

FOR IMMEDIATE RELEASE: (April 23, 2012)

Montreal, Canada — *International Polar Year 2012: From Knowledge to Action*

POPULATIONS OF ARCTIC MARINE MAMMALS AND FISH INCREASING, BIRDS ON EDGE OF DECLINE: FISH TRENDS LINKED TO CLIMATE OSCILLATIONS

Arctic marine mammals, fish, and birds are undergoing some surprising trends that, in some instances, can be partially linked to climate oscillations and changes in commercial harvest, according to a new report released by the Circumpolar Biodiversity Monitoring Program (CBMP), the cornerstone program of the Conservation of Arctic Flora and Fauna (CAFF), the Arctic Council's biodiversity working group.

The report identified that pelagic fishes (those living close to the surface of the water, as opposed to those living near the ocean bottom) were strongly linked to a large-scale climate oscillation (the Arctic Oscillation). This includes such commercially important species as Pacific herring, ocean perch and Arctic cisco.

"This was the thing that surprised us the most and illustrates the power of conducting large-scale analyses such as this," says Mike Gill, Chair of the CBMP. "Understanding these linkages will improve management of these species."

This linkage was able to help account for a dramatic increase of vertebrate species in the Pacific Ocean, and an average decline in the Atlantic Ocean. Other factors, including commercial harvest, help account for these differing trends as well.

The report is the result of new analysis of the Arctic Species Trend Index (ASTI), a tool that contains information on 890 populations of 323 species of Arctic vertebrates. The ASTI allows scientists to track broad trends in the Arctic's living resources and identify potential causes of changes, whether they are responses to natural phenomena or human-induced stressors.

"The ASTI is a valuable tool. It is helping to conserve and protect the Arctic by reducing the time between the identification of a threat, and an effective evidence-based policy response," says Gustav Lind, Senior Arctic Officials Chair of the Arctic Council. "This is the type of work that makes the Arctic Council the preeminent and authoritative voice in the Arctic."

Other findings of interest

- Arctic marine species have increased overall, driven by rising mammal populations and dramatic increases in fish populations.
- Overall, the marine fish index dramatically increased, with trends in marine fish differing depending on ocean region. There is an unabated decline in the Atlantic.
- Overall marine mammals increased across all ocean regions, levelling off in the mid-1990s. Some mammals are recovering from historical exploitation, however, increasing populations of species like the gray whale, bowhead whale and Greenlandic walrus have not likely returned to historical levels.



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- Marine birds slowly increased until the mid-1980s, then in 1998 began a slow and steady decline. This may be related to changes in climate, sea ice and food availability, but the causes may vary depending on the species, thus caution in interpreting the results is needed.
- The marine bird decline in recent years may be the beginning of a longer-term decline. It will be important to monitor this over the coming years.
- Three of the nine sea-ice associated species showed declines: ringed seal, beluga whale, and thick-billed guillemot. However, the data in the ASTI is not enough to calculate an overall trend index for sea-ice associated species. Given the lack of data, rapid changes in sea ice and concerning declining trends in some species, sea-ice associated species are a priority for targeted monitoring.
- The Atlantic Ocean is experiencing an average decline in vertebrate abundance thought to be driven, in part, by Arctic climate-driven regime shifts possibly operating in tandem with exploitation effects (commercial fishing).
- The Arctic Ocean is experiencing a small average increase in vertebrate abundance, driven by increases in fish and mammals since 1988.
- The Pacific Ocean experienced a dramatic increase in vertebrate abundance up until the early 1990s, likely driven by increases in recovering populations of mammals, and increases in pelagic fish strongly associated with changing marine conditions, such as warmer sea temperatures.

These recent ASTI analyses were a collaborative effort between the CBMP, the Zoological Society of London, and the World Wildlife Fund. Further information can be found at www.asti.is.

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