

The Arctic is Melting

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The Arctic is melting. Sea ice is rapidly disappearing as a result of climate change and warming seawater temperatures. According to a [CNN report](#), the Arctic is heating up twice as fast as the global average causing massive melting of sea ice.

A catastrophic marine ecosystem crisis of unimaginable consequences is taking shape. One that will impact whales, walrus, polar bears, seals, sea birds and zooplankton on which the entire food web depends on the cycle of life.

Since 1990, the thickness of sea ice has decreased by a third, according to the [Fram Strait Arctic Observatory](#).

In a study facilitated by [Greenpeace](#), a team of scientists are in the Fram Strait where warm waters originating from Mexico are brought up by the Gulf stream, flowing thousands of miles through the Atlantic to meet the Arctic ice edge.

Eighty percent of the ice movement in and out of the Arctic Ocean happens through here.

A massive change in the cycle is causing major concern to scientists. In the past sea ice loss has been a result of higher air temperatures melting the ice from above. But the warm water coming from the south is melting the ice from underneath.

Ice core samples are being used to investigate what's happening beneath the surface. The detritus of sea ice floes are teeming with zooplankton. A system dependent on the eruption of ice algae as the sea ice melts, described as a *nutrient injection*.

As the catastrophic losses of sea ice continue, the impacts are becoming evident.

The Eastern Pacific Gray whale is regarded as an indicator species of the Arctic seas. Every year, thousands of whales swim 10,000 miles from the [Bering](#) and [Chukchi Seas](#) to [Baja California](#) Lagunas in Mexico where they give birth to their calves, the longest migration of any marine mammal.

In the past few years as sea ice has continued to melt, Gray whales have been forced to move further north seeking prey, making their southern migration even longer requiring plenty of blubber to sustain them on their journey.

This season, [160 dead whales](#) have washed ashore in Mexico, US, and Canada. Almost all of the dead whales are emaciated and starvation has been identified as the cause of mortality. Experts say that this death toll, which is unprecedented, represents only 10% of the real mortality as dead whales sink to the seafloor.

Given the ongoing mortality, the [National Marine & Fisheries, NOAA](#) has declared an [Unusual Mortality Event \(UME\)](#) which makes funding available for the investigation by NOAA. However, the NMFS in public statements continues to push the line that the [Gray whale population estimate](#) is 27,000 and whales have reached their "carrying capacity".

Methodology for estimating the Gray whale population has consistently changed over the last 20 years. The most recent estimate is based on 2014 figures. Evidence of climate change impacts makes a mockery of any hypothesis that whales have reached their carrying capacity.

Gray whales are bottom feeders, scooping up benthic amphipods from the shallow coastal areas of the [Bering](#) and [Chukchi Seas](#).

[Dr Lance Barrett-Lennard, Director of Marine Mammal Research Program at Ocean Wise](#) says: *"The ultimate cause of most of those mortalities is the whales simply didn't get enough food last summer. It really worries us because those creatures are at the top and indicators of the health of the whole ecosystem."*

The [California Gray Whale Coalition](#) held a number of major scientific workshops in San Francisco over the past ten years, inviting scientific experts from Canada, Mexico, Alaska, USA and the Russian Federation to provide their latest research on Gray Whales and the marine environment on which the whales depend.

The Coalition petitioned the US Government to upgrade the Gray Whale as a Threatened Species under the [US Endangered Species Act](#) several times in the past

decade as a result of the increasing threats caused by naval sonar, climate change, crab pot mortality, industrial effluent and wave energy. The government rejected the petitions.

The Coalition has been involved in a number of lawsuits in the US in attempts to protect the whales. Although the excerpts below are dated from that time, their relevance to the current situation in the Arctic is prophetic.

Excerpts from their submissions provided grim projections:

“Knowledge of the feeding habits of Gray whales and the geological framework of which the habitat of amphipod depends suggests that any disturbance to the ecosystem could significantly reduce the Gray whale population within a few years.”
(Source: [Dr Hans Nelson, US Geological Survey](#))

[Dr Liz Alter](#) wrote: *“Nearly all marine species that depend on Arctic resources for prey will face impacts from climate change in the near future and Gray whales will be no exception.”*

From the [Alaska Program, 2004](#): *“Because ice habitat is so integral to the existence of the marine mammal species discussed in this paper the rapid loss of sea ice and the cumulative effects of other factors appear to set the stage for drastic reductions in population and ultimate extinction of marine mammal species.”*

[Dr Sue Moore](#), in a paper entitled [Marine Mammals as Ecosystems Sentinels](#) described Gray whales as *“sentinels of the sea, because the creatures are sampling and responding to the marine environment from Mexico to Alaska, and like walruses, mammals and polar bears, are early indicators of ecological crisis.”*

In 2009, an article in New Scientist headed [Arctic meltdown is a Threat to Humanity](#), indicated that some scientists predicted that as early as 2030, there will be no summer sea ice in the Arctic:

“A warmer Arctic will change the entire planet, and some of the potential consequences are nothing short of catastrophic. Changes in ocean currents, for instance, could disrupt the Asian monsoon, and nearly two billion people rely on those rains to grow their food. It is also positive feedback from the release of methane from melting permafrost could lead to runaway warming.

The danger is that if too much methane is released, the world will get hotter no matter how drastically we slash our greenhouse gas emissions.”

[Professor Ove Hoegh-Guldberg](#), inaugural director of the Global Change Institute, summed up the situation in [Science Magazine, 2010](#):

"Recent studies indicate that rapidly rising greenhouse gas concentrations are driving ocean systems toward conditions not seen for millions of years, with an associated risk of fundamental and irreversible ecological transformations."

Biological oceanographer [Mattias Cape](#) on the [Greenpeace Arctic Sunrise](#), which has been converted into a floating lab, explains the risks to humanity.

"These microscopic organisms (under the sea ice) play a vital role in reducing climate change by pulling planet warming carbon dioxide from the atmosphere and storing it as a long term carbon sink.

They photosynthesize and take in CO2 and expel oxygen as part of the process – which is the oxygen we breathe."

A study entitled [Arctic sea ice loss in the past linked to abrupt climate events](#) by the British Antarctic Survey shows ice core reductions in the Arctic in the period between 30-100,000 years ago led to major climate events. During this period, Greenland temperatures rose by as much as 16 degrees Celsius.

Many people ask for solutions. But unless climate change impacts are dealt with on the basis of a planetary emergency, the situation in the Arctic will continue to deteriorate. Gray whales and all other Arctic species reliant on a nutrient rich system need to be upgraded to endangered under the Endangered Species Act, as their future is grim indeed.

The MAHB Blog is a venture of the Millennium Alliance for Humanity and the Biosphere. Questions should be directed to joan@mahbonline.org