

The Arctic, a lesson for us all

The Arctic and its ecosystems are changing fast, much faster than scientists had predicted.

A vast area of the Arctic Ocean remains ice free as November begins, far later in the season than is typical. The monthly average ice extent for October is the lowest in the satellite record. On October 24, a record difference was set in daily ice extent relative to the 1981 to 2010 average. Ice extent is far below average in all of sectors of the Eurasian side of the Arctic Ocean and in Baffin Bay. See the chart below:

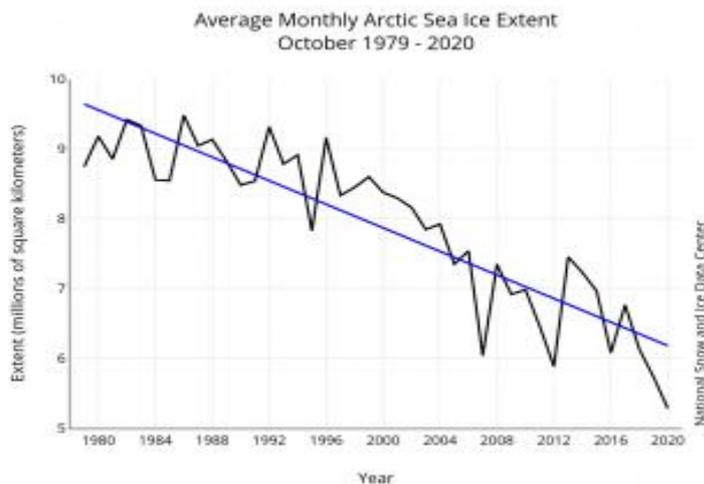


Figure 3. Monthly October ice extent for 1979 to 2020 shows a decline of 10.1 percent per decade.¹

The Arctic is warming twice as fast as other parts of the world. Indeed some parts of Northern Siberia from January to June this year warmed 7 times more than in times past. In the town of Verkheyansk in central Siberia the temperature on June 20th this year rose to 38°C !! This would be amazing for the UK never mind the Arctic.

Less snow and ice on the ground and in the sea leads to less reflectivity of solar radiation, which leads to more radiation being absorbed by the ground, a knock-on effect enhancing temperatures on the ground and in the sea. This results in another catastrophic impact; the melting of the permafrost in the tundra, which prompts the release of large quantities of methane gas stored under the permafrost. Methane is also stored in vast quantities under the continental shelf of northern Siberia. Methane is a much more dangerous greenhouse gas than CO₂. To put this into perspective, if just 1% of this methane is released it will equate to all of the CO₂ currently in the atmosphere in its ability to cause global warming. There has also been a huge reduction in Arctic glaciers. This alone has led to a 0.2m rise in sea level. There are now very many rivers running off the Greenland ice sheet and if all of the Greenland ice sheet melts, sea levels will rise by 7.2m. Scientists now predict that 140 million people will be affected by sea level rises by the end of the century. Take into account that many predictions on climate change made by scientists have turned out to be significant underestimates!

Climate change is already having a major effect on all ecosystems in the Arctic, from plants and animals on land to plankton and other marine life in our oceans, which are crucial for healthy food chains.. This includes the many groups of indigenous peoples who live in Arctic regions. Temperature and altitude limit the tree line in the Arctic as well as shrub and small vegetation cover beyond. Currently the tree line is extending further north. This affects both animals that live within the forests and those living outside. Reindeer, for example, tend to remain on the shrub layer so their territory is shrinking. This has led to a dramatic decline in reindeer numbers in recent years. Conversely, forest dwelling species such as moose, brown bear and musk ox populations are rising in numbers. Lemmings are no longer going through population explosions. This is bad news for the predator species that hunt them. With the decline in sea ice, polar bear numbers are predicted to fall by two thirds in the next 20-30 years. A reduction in the area of shrub and tundra will restrict the breeding of huge numbers of birds which migrate to those areas. It has already been observed that traditional sub-Arctic and temperate species such as red foxes, magpies and crows have already begun to move into Arctic regions.

The many groups of indigenous people who live in the Arctic are now not planning for climate change, but actively having to adapt to it. Some of the effects which these people have to cope with are directly influencing their hunting strategies, given that they are mostly meat eaters. The reduction in permafrost has already resulted in tree collapse, buildings crumbling, roads and air strips cracking up, and oil pipelines cracking.

At least we, who live outside the Arctic, have some time to plan for climate change. That's assuming that we take the threat seriously; for truly sustained change global governments, industry and individuals must take action, both collectively and individually. We have to accept that there will be millions of climate change refugees this century. What happens in the Arctic WILL affect everyone on Earth. But there are solutions. If globally we can radically invest in green energy, clean transport systems, sustainable agriculture and landscape-scale protection of habitats such as our forests and seabed. There are exciting opportunities in protecting 'blue carbon', for example, which offers an even greater potential than land-based habitats for carbon storage. To put this into context, it has been estimated that the carbon locked up in Scotland's seabed sediments alone equates to over half of Scotland's carbon emissions², so if we can galvanise governments and marine industries to protect these vast carbon stores, we can contribute significantly to reaching carbon reduction targets in the UK. Let's plan to both cope with climate change as well as reducing our carbon emissions.

Gordon McKay

¹ nsidc.org/arcticseaicenews/

² <https://scottishwildlifetrust.org.uk/our-work/our-projects/living-seas/blue-carbon/>

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