Polar species affected differently by global warming

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Scientists have discovered that global warming can affect the biodiversity of ecosystems in the Arctic and Antarctic in different ways despite the similarities between them. In an international study, scientists compared the robustness of food webs of the two polar ecosystems.

The research was carried out by scientists at the Spanish National Research Council and the University of Western Australia's Oceans Institute, who analysed the feeding relationships among 145 Arctic and 586 Antarctic species.

A report on the study, published in the journal *Marine Ecology Progress Series*, found that the Arctic ecosystem, which has a higher proportion of predator species, is more susceptible to disturbances affecting species such as whales and polar bears higher up the food chain.

According to the researchers, this phenomenon – called 'trophic cascade' – represents a major threat to the ecosystem because disturbances among predator species are more likely to affect species at lower levels.

The Antarctic food web, however, has a higher proportion of prey species and the effects of disturbances are most likely to affect species lower down the food chain. One example is evidence of a decrease of Antarctic krill caused by overfishing and climate change.

"By applying complex network theory to understand the topology of polar food webs, we have found distinctive elements – which are also relative to non-polar food webs – that show polar food webs, particularly the Arctic one, are highly vulnerable to functional extinctions of key species, such as Antarctic krill in the Antarctic food web," said one of the co-authors of the research.

The study also shows that the Arctic food web has more omnivorous species than the Antarctic and the loss of these species makes the Arctic more susceptible to invasion by other species.

Arctic and Antarctic poles are two of the regions where the effects of climate change are more intensely observed in the planet. While for the rest of the world an average increase in mean annual temperature of 0.5°C since 1950 has been recorded, for the Arctic and Antarctic Peninsula the increase has been three times as great.