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Widespread Arctic Wildlife Changes Seen with Global Warming

By Jessica Berman
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Russell Glacier, Greenland

Scientists carying out studies of wildlife in the Arctic say global warming is causing dramatic changes in animal and plant life, threatening some species with extinction.

The report is a compilation of studies of Arctic eco-systems by an international team of scientists who have been collaborating during the fourth International Polar Year,which ended in 2008.

Eric Post, a professor of biology at Penn State University and leader of the study team, says previous research has focused on the non-living or abiotic effects of global warming on the Arctic, including the melting of sea ice and subsequent rises in seawater levels. But Post says this is the first comprehensive report investigating the sweeping impacts of climate change on eco-systems and living creatures in the north polar region, including:

"Fresh water systems, terrestrial systems, resident species, migratory species, birds, mammals, plants, pretty much everything. It seems like wherever you look in the Arctic right now, things are changing quite rapidly," he said.

For example, Post says, the researchers found that red foxes and other species that thrived in the Arctic's southern ranges are moving north toward cooler, more hospitable climates. They are displacing Arctic foxes in competition for food. Other species migrating northward include winter moths that are defoliating mountain birch forests.

Another biological consequence of climate change in the Arctic, according to Post, is that the plant growing season is starting earlier than it did a decade ago. "And that might sound like a benefit because it's getting warmer and greener earlier. But there are species that migrate based on light cues and are expecting to arrive on their breeding grounds in the Arctic to

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take advantage of resources associated with start of the growing season. But they are arriving too late now and are suffering consequences for reproduction and survival of offspring," he said.

Species endangered by this earlier growing season include migratory caribou, common in the low Arctic landscape of Greenland. Increasing numbers of females there are unable to consume enough food to sustain pregnancies.

Researchers did find species that benefitted from the warming temperatures, including non-migratory wild reindeer on the Norwegian archipelago. These animals take advantage of the melting snow and longer growing seasons. Scientists say reindeer populations have increased because there's more food for them to eat.

The report notes that over the past 150 years, the concentration of greenhouse gases in the atmosphere has caused temperatures to warm an average of one-degree Celsius. That has resulted in a progressive loss of the Arctic's seasonal sea ice cover, at the rate of 45,000 square kilometers per year.

Species that are hardest hit by the shrinking ice are polar bears, seals and walruses, all of which have experienced reductions in their populations.

With temperatures expected to rise another six degrees Celsius by the end of the century, Post says polar bears, which now number between 20,000 and 25,000, face possible extinction. "Maybe within our lifetimes or the lifetime of our children, it seems like sea ice loss is happening so quickly that polar bear populations will become increasingly fragmented still. So, I think they are the ones that are at risk for extinction in the near future," he said.

Post says there are still many unanswered questions about the effects of climate change in the frozen region, such as why some eco-systems are thriving while other are on the brink of collapse.

Researchers hope future studies of Arctic biology will answer those questions. Their new report is published in this week's Science magazine.

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