

# Researcher examines effects of climate change and disease in polar bears

August 14 2014

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Dr. Colleen Duncan of CSU and research colleague Todd Atwood of the U.S. Geological Survey prepare to collect biological samples and health data from a tranquilized study subject.

Climate change is melting sea ice at a hastening pace, pushing polar bears from their historic hunting grounds to dry land – and potentially spawning a "perfect storm" that could devastate the great Arctic carnivores through decreased food supply and increased exposure to disease, pollution and people, a Colorado State University researcher

says.

Colleen Duncan, a CSU veterinarian and assistant professor of pathology, is a lead investigator on a research project that is collecting and analyzing data to better understand the impacts of [climate change](#) and infectious disease on population dynamics of polar bears.

"The question is, 'What's going to happen in the future?' What happens when you get a little bit of infectious disease, a little bit of environmental contamination, and you superimpose that on decreased access to food and interaction with humans?" Duncan asked. "There's the setup for a perfect storm."

Duncan recently traveled to northernmost Alaska with fellow researchers from the U.S. Department of Agriculture and U.S. Geological Survey to collect evidence from study subjects. The team tracked wild polar bears across vast fields of snow and ice, tranquilized them so they could be weighed and measured, swabbed their mouths, and collected blood samples and other health-related information. They worked with one to five bears each day of the trip, and one day even encountered a sow with two snowy-white yearlings.

Now Duncan and her colleagues are immersed in the analysis that they hope will provide new insights into the complex and intertwined effects of climate change and disease on polar bears and other species.

"We need to study infectious disease in the context of climate change," said Duncan, who works in the CSU College of Veterinary Medicine and Biomedical Sciences. "One thing on its own doesn't do it. We need to look at the cumulative effects. You can't put a fence around their habitat and save the [polar bear](#)."

Polar bears have become a poster species for climate change because the

animals – whose scientific name means "sea bear" – have always lived by hunting seals on remote ice. With diminishing [sea ice](#), the bears increasingly are moving inland and are potentially exposed to diseases they have not previously encountered.

For instance, Duncan said, polar bears have joined the scavengers that feed on whale bones piled together by indigenous Alaskan tribes. This relatively new behavior means different food, disease and environmental exposure that could affect bear health in multiple ways, she noted.

The infectious disease project, funded by the North Pacific Research Board, is one of three she has undertaken with fellow investigators Pauline Nol and Kelly Patyk of the USDA and Todd Atwood of the USGS.

Their work is notable for collecting samples from wild polar bears, instead of those living in zoos in non-native climates, meaning findings could provide a more realistic view of health changes, said Anna Fagre, a fourth-year veterinary student at CSU who has reviewed research literature for the team.

The biological samples collected from polar bears reveal the presence of antibodies that, in turn, tell researchers about exposure to [infectious diseases](#). Because polar bears are at the top of the food chain in their ecosystem, data from bears provides insight into seals and other Arctic wildlife – information also relevant to native people who depend on wildlife as a food source.

Duncan, an expert in zoonotic diseases that are passed among animals and people, spent Earth Day in Alaska with polar bears. It left a lasting impression.

"I may never see a polar bear again in my lifetime. They may be

extinct," she said. "It was a real wake-up call. If you see a polar bear in the wild, it will utterly change you."

Provided by Colorado State University

Citation: Researcher examines effects of climate change and disease in polar bears (2014, August 14) retrieved 10 May 2024 from

<https://phys.org/news/2014-08-effects-climate-disease-polar.html>

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