

Alarming levels of PFAS in Norwegian Arctic ice pose new risk to wildlife

Oxford University-led study detects 26 types of PFAS compounds in ice around Svalbard, threatening downstream ecosystems



A polar bear in Svalbard, Norway. 'As a polar bear, you have exposure to toxic man made chemicals, and stresses from a changing habitat.' Photograph: Paul Souders/Getty Images

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Norwegian Arctic ice is contaminated with alarming levels of toxic PFAS, and the chemicals may represent a major environmental stressor to the region's wildlife, **new research** finds.

The Oxford University-led study's measurements of ice around Svalbard, **Norway**, detected 26 types of PFAS compounds, and found when ice melts, the chemicals can move from glaciers into downstream ecosystems like Arctic fjords and tundra.



'Forever chemicals': what are PFAS and what risk do they pose?

The meltwater can contain a cocktail of contaminants that includes PFAS and affects the entire food web, including plankton, fish, seal and apex animals like polar bears, which have previously been **found** to have high PFAS levels in their blood.

“There’s a washout of contaminants that occurs seasonally ... and some PFAS seem to be mobile during melts, which could be important to ecosystems downstream,” said Dr William Hartz, a lead author on the study who noted a “doubling up effect” on animals as climate changes and ice melts. The climate has been warming **faster** in Svalbard than the world’s average.

“As a polar bear, you have exposure to toxic manmade chemicals, and stresses from a changing habitat,” he added.

PFAS are a class of about 12,000 chemicals often used to make thousands of consumer products resist water, stains and heat. They are called “forever chemicals” because they do not naturally break down, and they are linked to cancer, liver disease, kidney stress, fetal complications and other serious health problems.

Among PFAS compounds researchers found in ice at levels above US advisory drinking water limits were PFOS and PFOA, which are considered to be two of the most dangerous.

The study also found particularly high levels of TFA, a refrigeration byproduct. During the Montreal Protocol in 1987, many nations agreed to phase out chlorofluorocarbons, or CFCs, a potent greenhouse gas used for refrigeration. Those were ultimately replaced with hydrofluoro-olefin, or HFOs.



Freshwater fish more contaminated with ‘forever chemicals’ than in oceans

Once in the environment, HFOs, which are also a greenhouse gas, can turn into TFA, and TFA levels are increasing in the **Arctic**, the study and results from previous measurements have found. TFA and other PFAS compounds are highly mobile and can move through the atmosphere to be deposited in the Arctic or elsewhere around the world.

Though TFA is thought to be less toxic than many other PFAS, the chemical has not been thoroughly studied, so no one knows what damage the compounds may be doing.

“Limited knowledge about the safe levels of TFA in the environment needs addressing,” the authors stated.