

Siren sounds on nuclear fallout embedded in melting glaciers

April 10 2019, by Patrick Galey



The team found manmade radioactive material in all 17 glaciers sites they surveyed

Radioactive fallout from nuclear meltdowns and weapons testing is nestled in glaciers across the world, scientists said Wednesday, warning

of a potentially hazardous time bomb as rising temperatures melt the icy residue.

For the first time, an international team of scientists has studied the presence of nuclear fallout in ice surface sediments on glaciers across the Arctic, Iceland the Alps, Caucasus mountains, British Columbia and Antarctica.

It found manmade radioactive material at all 17 survey sites, often at concentrations at least 10 times higher than levels elsewhere.

"They are some of the highest levels you see in the environment outside nuclear exclusion zones," said Caroline Clason, a lecturer in Physical Geography at the University of Plymouth.

When radioactive material is released into the atmosphere, it falls to earth as [acid rain](#), some of which is absorbed by plants and soil.

But when it falls as snow and settles in the ice, it forms heavier sediment which collects in glaciers, concentrating the levels of nuclear residue.

The Chernobyl disaster of 1986—by far the most devastating nuclear accident to date—released vast clouds of radioactive material including Caesium into the atmosphere, causing widespread contamination and acid rain across northern Europe for weeks afterwards.

"Radioactive particles are very light so when they are taken up into the atmosphere they can be transported a very long way," she told AFP.

"When it falls as rain, like after Chernobyl, it washes away and it's sort of a one-off event. But as snow, it stays in the ice for decades and as it melts in response to the climate it's then washed downstream."

The [environmental impact](#) of this has been shown in recent years, as wild boar meat in Sweden was found to contain more than 10 times the safe levels of Caesium.



The Chernobyl disaster of 1986 caused widespread radioactive contamination and acid rain across northern Europe

'A mark we've left'

Clason said her team had detected some fallout from the Fukushima meltdown in 2011, but stressed that much of the particles from that particular disaster had yet to collect on the ice sediment.

As well as disasters, radioactive material produced from weapons testing was also detected at several research sites.

"We're talking about weapons testing from the 1950s and 1960s onwards, going right back in the development of the bomb," she said. "If we take a sediment core you can see a clear spike where Chernobyl was, but you can also see quite a defined spike in around 1963 when there was a period of quite heavy weapons testing."

One of the most potentially hazardous residues of human nuclear activity is Americium, which is produced when Plutonium decays.

Whereas Plutonium has a half-life of 14 years, Americium lasts 400.

"Americium is more soluble in the environment and it is a stronger alpha (radiation) emitter. Both of those things are bad in terms of uptake into the food chain," said Clason.

While there is little data available on how these materials can be passed down the [food chain](#)—even potentially to humans—Clason said there was no doubt that Americium is "particularly dangerous".

As geologists look for markers of the epoch when mankind directly impacted the health of the planet—known as the Anthropocene—Clason and her team believe that radioactive particles in ice, soil and sediment could be an important indicator.

"These materials are a product of what we have put into the atmosphere. This is just showing that our nuclear legacy hasn't disappeared yet, it's still there," Clason said.

"And it's important to study that because ultimately it's a mark of what we have left in the environment."

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