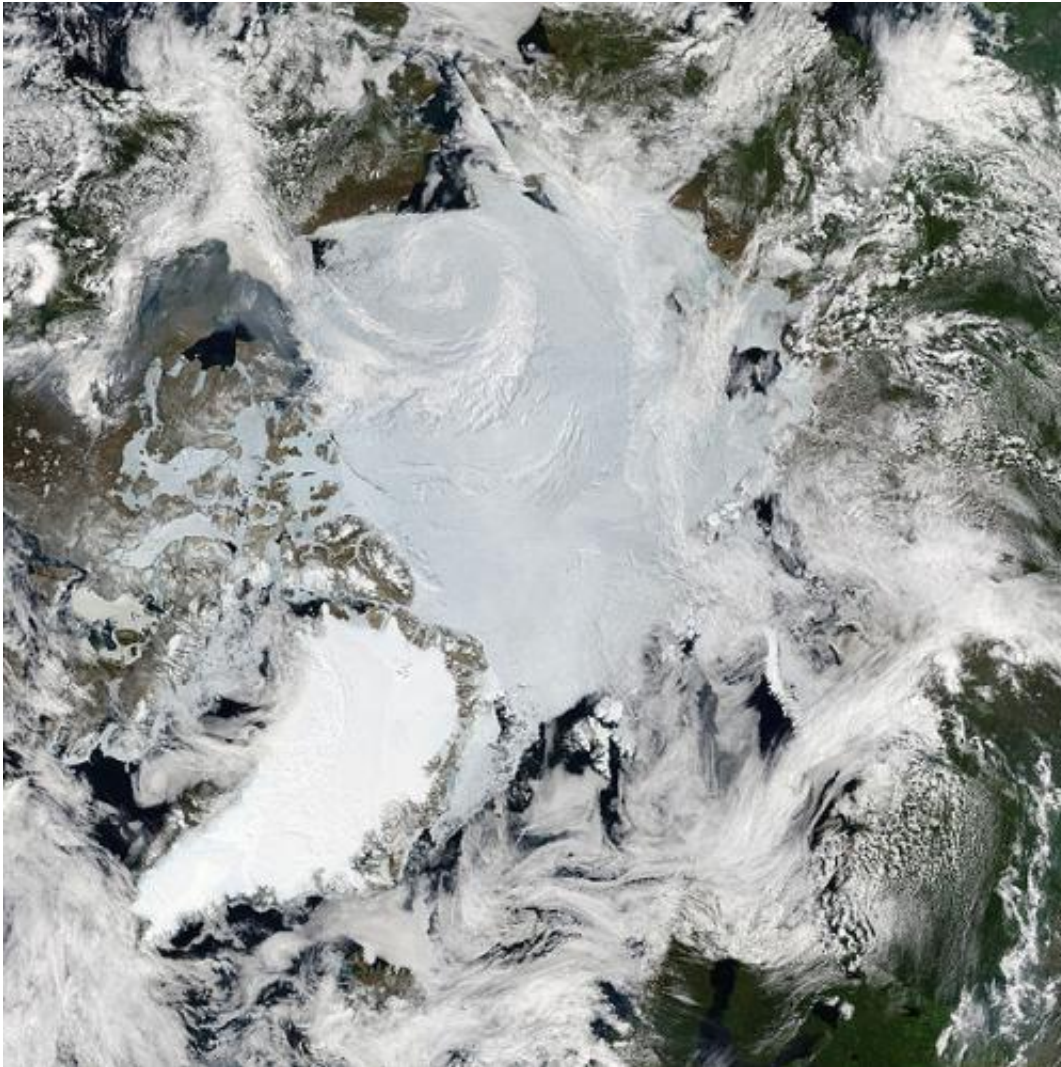


# Data gaps hamper monitoring of heavy metals that threaten Arctic communities

June 3 2020

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Mosaic of images of the Arctic by MODIS. Credit: NASA

Some Alaskan soils harbor elevated concentrations of heavy metals that can harm human health, but critical data gaps impede understanding of exposure risks for Arctic communities. Clarice Perryman of the University of New Hampshire, Durham, and colleagues present these findings in the open-access journal *PLOS ONE* on June 3, 2020.

Many Arctic and sub-Arctic communities face heavy metal contamination of their food and water resulting from activities such as mining and drilling. As global temperatures rise, thawing of permafrost—frozen soils—could also release naturally occurring heavy metals into Arctic ecosystems, potentially intensifying health risks. However, the amount of toxic metals in Arctic soils and the risks they pose are unclear.

Perryman and colleagues set out to synthesize previously collected data in order to clarify soil metal concentrations across the Arctic, but were quickly stymied by a severe lack of publicly available data. Instead, they drew from the USGS Alaskan Geochemical Database to assess data on arsenic, chromium, mercury, nickel, and lead concentrations in over 1,000 [soil samples](#) collected in Alaskan soils.

Most of the available data were limited to southern and southwestern Alaska, where permafrost is patchy. Meanwhile data were severely lacking for permafrost-heavy regions in northern Alaska and the more heavily populated Interior. The data for southern and southwestern Alaska indicate that heavy [metal](#) concentrations in this region's soils are often at least twice as high as average levels for U.S. soils.

Heavy metals can cause cancer, neurological damage, kidney damage, and other health problems. The elevated levels seen in this study highlight a need for additional data to clarify how thawing permafrost could impact the health of communities across the Arctic. In particular, the authors note, further sampling is needed near human populations, in

permafrost-heavy regions, and at greater [soil](#) depths.

The authors add: "Collecting more data on the amount of [heavy metals](#) stored in permafrost is critical—but equally important is making sure these data are accessible to researchers, decision makers, and communities in order to help Arctic communities prepare and be resilient to the many effects of permafrost thaw."

**More information:** Perryman CR, Wirsing J, Bennett KA, Brennick O, Perry AL, Williamson N, et al. (2020) Heavy metals in the Arctic: Distribution and enrichment of five metals in Alaskan soils. *PLoS ONE* 15(6): e0233297. [doi.org/10.1371/journal.pone.0233297](https://doi.org/10.1371/journal.pone.0233297)

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