

Scientist finds Alaska's Arctic coastal towns face extensive inundation

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Louise Farquharson, a research assistant professor at the UAF Geophysical Institute, checks a borehole near Nome on Alaska's Seward Peninsula. Credit: Vladimir Romanovsky

Coastal erosion and land subsidence driven by permafrost thawing may lead to extensive seawater inundation in several northern Alaska communities by 2100, according to research by a University of Alaska Fairbanks geomorphologist.

Louise Farquharson, a research assistant professor at the UAF Geophysical Institute, made the long-term projections for the communities of Point Lay, Wainwright, Kaktovik and Utqiagvik. Her work includes an assessment of the impact of gravel pads, which absorb warmth faster than the moss and peat of the region's undisturbed land.

The research uses the worst-case scenario of the Intergovernmental Panel on Climate Change. It assumes no significant change in global [carbon dioxide output](#).

Under that scenario, ground temperature increases in the communities Farquharson examined range from 10 to 14 degrees from 2020 to 2100 for terrain in its natural condition. Temperatures rise an additional degree where the ground is overlain by a hypothetical 4 feet of gravel for community development.

That leads to extensive permafrost thaw and a resultant subsidence of the land surface.



The amount of subsidence can be inferred by the distance from the bottom step to the ground in this photo of a building in Point Lay, Alaska. Credit: Bill Tracey

"What's interesting is that it does seem like inundation from the ocean is going to be a more significant process than just the [coastal erosion](#) of bluff tops," Farquharson said, noting her results are preliminary. "The erosion rates are going to result in some land loss, but it's insignificant compared to how much land might be lost if we have as much inundation as our initial estimates suggest."

"The take-home message is just that we're going to see a significant

amount of warming across both natural and gravel pad areas, which will result in thaw, subsidence, and [inundation](#)" she said.

Farquharson worked in collaboration with Dmitry Nicolsky and Vladimir Romanovsky at the UAF Geophysical Institute Permafrost Laboratory.

More information: Find Louise Farquharson's abstract [here](#).

Provided by University of Alaska Fairbanks

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