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Global impacts of thawing Arctic permafrost may be imminent

By [Paul Voosen](#) Oct. 21, 2019 , 11:00 AM

The Arctic permafrost, frozen soil that is chock full of carbon, is a ticking time bomb. When it thaws because of global warming, sometimes slumping into pits like on Herschel Island in Canada (above), scientists believe it is likely to release more carbon than it absorbs from new plant growth—adding to the atmosphere’s burden and accelerating climate change. But studies in the Arctic have been so limited that **no one could say** when that time would come.

It’s here now, according to research **published today** by a large team of scientists in *Nature Climate Change*. By pooling observations from more than 100 Arctic field sites, scientists from the Permafrost Carbon Network estimate that permafrost released an average of 1662 teragrams of carbon each winter from 2003 to 2017—double that of past estimates. Meanwhile, during the summer growing season, other surveys have found that the landscape absorbs only 1032 teragrams—leaving an average of more than 600 teragrams of carbon to escape to the atmosphere each year.

The study remains limited by the paucity of Arctic observations; the overall uncertainty of Arctic winter emissions, for example, is 813 teragrams, nearly half the total emissions. The study also found no rise in emissions since 2003. Still, researchers say, it’s a sign that the permafrost feedback—which would see carbon emissions from permafrost lead to warming that would in turn thaw more permafrost—is already underway.