

When the world ended in ice

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A classic map of the ice lobe that covered the New York metro area until the end of the last ice age. (R.D. Salisbury, 1902)

(Phys.org) -- A mile or so of glacial ice covering much of North America and plowing down from the north once terminated in the New York metropolitan area, at a front stretching roughly from exit 13 on the New Jersey Turnpike (Rahway), on across southern Staten Island, the Bensonhurst neighborhood of Brooklyn, and northeastward through Long Island. But exactly when that ice started to seriously melt has long been an enigma.

Depending on methodology, geologists have estimated 21,000 to 28,000 years ago—a range that does not seem to match records of sea-level rise and other oceanographic indicators, which place the turning point more

recently, at maybe 17,000 years. Knowing the timing is important, because it applies to how the ocean, atmosphere and ice might interact today during the increasingly rapid melting of glaciers farther north.

Now, a group of researchers at Columbia University's Lamont-Doherty Earth Observatory says they have found evidence that the more recent date is right. Led by geochemist Dorothy Peteet, the group analyzed plant microfossils that they removed in cores drilled into the bottoms of more than a dozen lakes and bogs in the region. These cores suggest that vegetation did not appear around Connecticut, New York's Hudson Valley, northern New Jersey and southeastern Pennsylvania until just 15,000 or 16,000 years ago. The absence until then suggests that ice still covered the landscape, or at the very least that temperatures were still so cold, plants could not survive. Their study appears in the latest issue of the journal *Geophysical Research Letters*.

"The history of the retreat of the southeastern margin [of the continental ice sheet] is particularly relevant today as Greenland warms and meltwater enters the North Atlantic," say the authors. The Greenland [ice](#) sheet is now melting much faster than most researchers thought possible, and some say it is on the verge of reaching a tipping point of rapid dissolution.

Many scientists, including Peteet, believe that some initial melting did take place some 20,000-plus years ago. However, that introduced a huge pulse of fresh meltwater into the Atlantic Ocean—an event that then shut down currents bringing up heat from the south, and thus threw the north back into a temporary deep freeze. According to this scenario, 5,000 years or so later, the melting picked up steam again—exactly when Peteet's study concludes it did.

Peteet (who also has an appointment at the NASA Goddard Institute for Space Studies) and her colleagues are continuing their work, with coring trips planned later this summer to forests and wetlands in New York

City's Jamaica Bay; Highpoint, N.J.; and Black Rock Forest in the Hudson Valley.

More information: www.agu.org/journals/gl/gl1211...884/2012GL051884.pdf

Provided by Columbia University

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