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### **A Holocene Millennial-Scale Storm Cycle in the Northeastern United States**

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Long sediment cores were recovered from 13 small, deep Vermont and New York lakes with steep drainage basins across a ~20,000-sq.-km region. In each core, several flood layers consisting of coarse-grained, mineral-rich sediment with abundant macrofossils of terrestrial plants punctuate the otherwise fine-grained, organic gyttja matrix. The ages of these flood layers reveal that the frequency of severe rainstorms in the northeastern United States has varied in regular cycles during the past 13,000 years, with a dominant periodicity of about 3,000 years. Storminess peaked at approximately 2,600, 5,800, 9,100, and 11,900 years ago, and appears to be presently increasing toward another peak. These maxima coincide with cold periods in Europe, with times of enhanced sea salt aerosol deposition to the Greenland ice sheet, and with storm and flood events from various locations around the North Atlantic. These relationships are consistent with long-term changes in the preferred phase of the Arctic Oscillation, suggesting that modulation of this dominant atmospheric mode may account for a significant portion of Holocene climate variability.

2001 AGU Fall Meeting

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