

Supplement: Climatic history of the northeastern United States during the past 3000 years

Jennifer R. Marlon^{1*}, Neil Pederson², Connor Nolan³, Simon Goring⁴, Bryan Shuman⁵, Robert Booth⁶, Patrick J. Bartlein⁷, Melissa A. Berke⁸, Michael Clifford⁹, Edward Cook¹⁰, Ann Dieffenbacher-Krall¹¹, Michael C. Dietze¹², Amy Hessl¹³, J. Bradford Hubeny¹⁴, Stephen T. Jackson^{3,15}, Jeremiah Marsicek⁵, Jason McLachlan¹⁶, Cary J. Mock¹⁷, David J.P. Moore¹⁸, Jonathan Nichols¹⁹, Ann Robertson¹, Kevin Schaefer²⁰, Valerie Trouet²¹, Charles Umbanhowar²², John W. Williams⁴, Zicheng Yu⁶

¹Yale School of Forestry and Environmental Studies, CT 06511, USA

²Harvard Forest, Harvard University, MA 01366, USA

³Department of Geosciences, University of Arizona, AZ 85721, USA

⁴Department of Geography, Center for Climatic Research, University of Wisconsin-Madison, WI 53706, USA

⁵Department of Geology and Geophysics, University of Wyoming, WY 82071, USA

⁶Earth and Environmental Science Department, Lehigh University, PA 18015, USA

⁷Department of Geography, University of Oregon, OR 97108, USA

⁸Department of Civil and Environmental Engineering and Earth Sciences, University of Notre Dame, IN 46556, USA

⁹Division of Earth and Ecosystem Sciences, Desert Research Institute in Las Vegas, NV 89119, USA

¹⁰Tree-Ring Laboratory, Lamont-Doherty Earth Observatory, NY 10964, USA

¹¹School of Biology and Ecology, University of Maine, ME 04469 USA

¹²Department of Earth and Environment, Boston University, MA, 02215 USA

¹³Department of Geology and Geography, West Virginia University, WV 26501, USA

¹⁴Department of Geological Sciences, Salem State University, Salem, MA 01970, USA

¹⁵Southwest Climate Science Center, US Geological Survey, Tucson, AZ 85719, USA

¹⁶Department of Biological Sciences, University of Notre Dame, IN 46556, USA

¹⁷Department of Geography, University of South Carolina, SC 29208, USA

¹⁸Department of Geosciences and School of Natural Resources and Environment, University of Arizona, Tucson, AZ 85721, USA

¹⁹Biology and Paleo Environment, Lamont-Doherty Earth Observatory, NY 10964, USA

²⁰Snow and Ice Data Center, CIRES, University of Colorado, CO 80309, USA

²¹Laboratory of Tree-Ring Research, University of Arizona, AZ 85721, USA

²²Department of Biology, St. Olaf College, MN 55057, USA

*Correspondence: J.R. Marlon (jennifer.marlon@yale.edu)

Following are the site locations for Figure 1 in the main text (top panel: sites by proxy type). Temperature data for Figure 5 and hydroclimate data for Figure 7 are available for download in Excel format.

Supplementary Table 1. Paleoclimate sites used in this study.

<i>Site</i>	<i>Lat.</i>	<i>Long.</i>	<i>Data Type</i>	<i>Source</i>	<i>Citation</i>
Great Heath, ME	44.70	-67.81	Testate Amoeba	Bog sediment	Clifford and Booth (2013)
Hole Bog, MN	47.30	-94.25	Testate Amoeba	Bog sediment	Booth et al. (2006)
Irwin Smith Bog, MI	45.03	-83.62	Testate Amoeba	Bog sediment	Booth et al. (2012)
Minden Bog, MI	43.62	-82.84	Testate Amoeba	Bog sediment	Booth et al. (2003)
Pinhook Bog, IN	41.61	86.85	Testate Amoeba	Bog sediment	Booth et al. (2012)
Saco Bog, ME	43.55	-70.46	Testate Amoeba	Bog sediment	Clifford and Booth (2013)
Sidney Bog, ME	44.39	-69.78	Testate Amoeba	Bog sediment	Clifford and Booth (2013)
South Rhody Bog, MI	46.56	86.07	Testate Amoeba	Bog sediment	Booth et al. (2012)
White Lake, NJ	41.00	-74.80	IRM	Lake sediment	Li et al. (2007)
			Sphagnum/ Vascular		
The Great Heath, ME	44.70	-67.81	Ratio	Lake sediment	Nichols and Huang (2012)
Davis Pond, MA	42.14	-73.40	Lake Level	Lake sediment	Newby et al. (2014)
Deep Pond, MA	41.56	-70.64	Lake Level	Lake sediment	Marsicek et al. (2013)
New Long Pond, MA	41.85	-70.71	Lake Level	Lake sediment	Newby et al. (2014)
Mathews Pond, ME	43.27	-70.86	Lake Level	Lake sediment	Dieffenbacher-Krall (2005)
Whitehead Lake, ME	46.46	-67.86	Lake Level	Lake sediment	Dieffenbacher-Krall (2005)
Green Lake, NY	43.05	-75.97	Varve thickness	Lake sediment	Hubeny et al. (2014)
Pettaquamscutt River Estuary, RI	41.50	-71.45	Varve thickness	Lake sediment	Hubeny et al. (2014)
Emerald Basin	45.89	-62.80	Alkenones	Marine sediment	Keigwin et al. (2011)
Scotian Margin	44.00	-63.00	Alkenones	Marine sediment	Sachs et al. (2007)

References

- Booth, R. K. and Jackson, S. T.: A high resolution record of late Holocene moisture variability from a Michigan raised bog, *The Holocene*, 2003. 2003.
- Booth, R. K., Jackson, S. T., Sousa, V. A., Sullivan, M. E., Minckley, T. A., and Clifford, M. J.: Multi-decadal drought and amplified moisture variability drove rapid forest community change in a humid region, *Ecology*, 93, 219-226, 2012.
- Booth, R. K., Notaro, M., Jackson, S. T., and Kutzbach, J. T.: Widespread drought episodes in the western Great Lakes region during the past 2000 years: geological extent and potential mechanisms, *Earth and Planetary Science Letters*, 242, 415–427, 2006.
- Clifford, M. and Booth, R.: Increased probability of fire during late Holocene droughts in northern New England, *Climatic Change*, 119, 693-704, 2013.
- Dieffenbacher-Krall, A. C. and Nurse, A. M.: Late-glacial and Holocene record of lake levels of Mathews Pond and Whitehead Lake, northern Maine, USA, *Journal of Paleolimnology*, 34, 283-309, 2005.
- Hubeny, B. J., King, J. W., and Reddin, M.: Northeast US precipitation variability and North American climate teleconnections interpreted from late Holocene varved sediments, *Proceedings of the National Academy of Sciences*, 108, 17895-17900, 2011.

- Keigwin, L. D., Sachs, J. P., and Rosenthal, Y.: A 1600-year history of the Labrador Current off Nova Scotia, *Climate Dynamics*, 21, 53-62, 2003.
- Li, Y.-X., Zicheng, Y., and Kodama, K. P.: Sensitive moisture response to Holocene millennial-scale climate variations in the Mid-Atlantic region, USA, *The Holocene*, 1, 3-8, 2007.
- Newby, P. E., Shuman, B. N., Donnelly, J. P., Karnauskas, K. B., and Marsicek, J.: Centennial-to-millennial hydrologic trends and variability along the North Atlantic Coast, USA, during the Holocene, *Geophysical Research Letters*, 41, 2014GL060183, 2014.
- Nichols, J. E. and Huang, Y.: Hydroclimate of the northeastern United States is highly sensitive to solar forcing, *Geophysical Research Letters*, 39, 2012.
- Sachs, J. P.: Cooling of Northwest Atlantic slope waters during the Holocene, *Geophysical Research Letters*, 34, 2007.