

TIMOTHY L. COOK

Bates College Geology Department
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EDUCATION

University of Massachusetts Amherst – Ph.D. in Geology 2009

Dissertation title: “*Climate and Environmental Change in Arctic Canada: Observations from Upper and Lower Murray Lakes, Ellesmere Island, Nunavut*”
Advisor: Raymond S. Bradley

University of Delaware, Graduate College of Marine Studies – M.S. in Oceanography 2004

Thesis title: “*Observations of sediment transport in the Delaware estuary during spring runoff conditions*”
Advisor: Christopher K. Sommerfield

Brown University – Sc.B. in Geological sciences 2001

Senior thesis title: “*Fluvial sediments of the Rhode Island Formation: Lithofacies Relationships at Dodgeville, MA*”

University of Otago, Dunedin, New Zealand – semester of foreign study in 2000

PROFESSIONAL EXPERIENCE

2011 to Present **Bates College, Lewiston, ME** – Visiting Assistant Professor in Geology

Courses include: *Sedimentary Processes and Environments; Coastal & Estuarine Processes; and Earth Surface Environments and Environmental Change*

2010 to 2011 **University of Massachusetts, Amherst, MA** – Senior Postdoctoral Fellow

Conducting research on the Quaternary climate history of the Arctic; responsible for the analysis and interpretation of the physical characteristics of a 3.6 million year lake sediment record

2009-2010 **Lafayette College, Easton, PA** – Visiting Assistant Professor in Geology

Courses taught: *Earth’s Climate: Past, Present and Future; Oceanography; Climate Change: The Facts, the Issues, and the Long-Term View; Paleolimnology*

2008-2009 **University of Vermont, Burlington, VT** – Lecturer in Geology

Courses taught: *Earth System Science, Earth Hazards, and Geological Oceanography*

2004-2008 **University of Massachusetts, Amherst, MA** – Research Assistant

Collected and analyzed high-resolution paleoclimatic data, planned and led field expeditions to the Canadian and Norwegian Arctic to study modern lake sedimentation, conduct geophysical surveys of lake stratigraphy, and collect sediment cores for the study of past climate and environmental conditions

2002-2004 **University of Delaware, Lewes, DE** – Research Assistant
Carried out field and laboratory investigations involving coastal oceanography and sedimentary processes including the collection and analysis of sedimentological, geophysical, and time-series data, and participated in multiple oceanographic cruises

OVERVIEW OF RESEARCH INTERESTS

My research interests are broadly concerned with understanding the processes that govern interactions between the climate system, the hydrosphere, land surfaces and the sedimentary record. I investigate how both natural and human changes in the Earth system influence sedimentary processes and apply this knowledge to studies of long-term climate and environmental change. I work in environments spanning coastal marine, freshwater lake, and river settings in locations ranging from the High Arctic to the tropical Pacific. This work spans time-scales ranging from modern processes through orbital scale variations of the Quaternary period.

GRANTS & AWARDS

- *Proposal in review* for NSF Paleo Perspectives on Climate Change program titled “Assessment of climatic controls on the frequency of extreme precipitation in the northeastern US”
- 2007 – NASA Alaska Satellite Facility, funding awarded for the project “Impacts of Climate Variability on High Arctic Lake-Ice Dynamics”
- 2007 – Massachusetts Space Grant Consortium Summer Fellowship
- 2004 – Kenneth N. Weaver Student Travel Award, Geological Society of America
- 2004 – Grant in Aid of Research, Sigma Xi Scientific Research Society
- 2001 – Elected to Sigma Xi Scientific Research Society

PUBLICATIONS (peer reviewed)

Melles, M., Brigham-Grette, J., Minyuk, P., Koeberl, C., Andreev, A., **Cook, T.**, Gebhardt, C., Haltia-Hovi, E., Kukkonen, M., Nowaczyk, N., Schwamborn, G., Wennrich, V., and the El’gygytgyn Scientific Party. The Lake El’gygytgyn Scientific Drilling Project – Conquering Arctic Challenges through Continental Drilling, *Scientific Drilling*, 11: 29-40.

Cook, T. L., and Bradley, R. S., 2010. An analysis of past and future changes in the ice cover of two high-arctic lakes based on synthetic aperture radar (SAR) and Landsat imagery, *Arctic, Antarctic, and Alpine Research*, 42: 9-18.

Kaufman, D. S., Schneider, D. P., McKay, N. P., Ammann, C. M., Bradley, R. S., Briffa, K. R., Miller, G. H., Otto-Bliesner, B. L., Overpeck, J. T., Vinther, B. M., and Arctic Lakes 2k Project Members (Abbott, M., Axford, Y., Bird, B., Birks, H. J. B., Bjune, A. E., Briner, J., **Cook, T.**, Chipman, M., Francus, P., Gajewski, K., Giersdottir, A., Hu, F. S., Kutchko, B., Lamoureux, S., Loso, M., MacDonald, G., Peros, M., Porinchu, D., Schiff, C., Seppa, H., and Thomas, E.), 2009. Recent warming reverses long-term Arctic cooling. *Science*, 325: 1236-1239.

Cook, T. L., Bradley, R. S., Stoner, J. S., and Francus, P. 2009. Five thousand years of sediment transfer in a High Arctic watershed recorded in annually laminated sediments from Lower Murray Lake, Ellesmere Island, Nunavut, Canada, *Journal of Paleolimnology*. DOI: 10.1007/s10933-008-9252-0

Cook, T. L., Sommerfield, C. K., and Wong, K.-C., 2007. Observations of tidal and springtime sediment transport in the upper Delaware Estuary, *Estuarine, Coastal and Shelf Science*, vol. 72: 235-246. doi:10.1016/j.ecss.2006.10.014.

TALKS AND ABSTRACTS

Cook, T., and Bradley, R. S., 2011 Extreme depositional events in the context of annually resolved records of sediment accumulation, 2nd PAGES Varves Working Group Workshop, Corpus Christie, TX.

Cook, T., Brigham-Grette, J., and the El'gygytgyn Science Team, 2011. Rapid visualization of stratigraphic data: Developments from the El'gygytgyn Drilling Project, 41st International Arctic Workshop, Program and Abstracts, pp. 64-65.

St-Onge, G., Stoner, J., Barletta, F., Lisé-Pronovost, A., St-Onge, M.-P., Ledu, D., Rochon, A., Darby, D., Polyak, L., Francus, P., Bradley, R. S., and **Cook, T. L.**, 2011. Holocene paleomagnetic secular variation and relative paleointensity in the Canadian Arctic, 41st International Arctic Workshop, Program and Abstracts, p. 249.

Cook, T., Vennrich, V., Kukkonen, M., Melles, M., and Brigham-Grette, J., 2010. Characteristics and paleoenvironmental significance of lacustrine sediments in the El'gygytgyn drill core, *Eos Transactions. AGU*, 91 (55). Fall Meeting Supplement, Abstract PP21B-1699.

Cook, T., Francus, P., and Bradley, R., 2010. Sedimentary Evidence for Changes in the Dissolved Oxygen Content of a High-Arctic Lake and its Impact on Varve Preservation, 40th International Arctic Workshop, Program and Abstracts, p. 55.

Stoner, J. S., Davies, M. H., Bradley, R. S., **Cook, T. L.**, Francus, P., Besonen, M. R., Channell, J. E., and St-Onge, G., 2009. Observations on the Late Holocene Dynamics of the Boreal Geomagnetic Field from Ellesmere Island Lake Sediments, *EOS Transactions. AGU*, 90 (22), Joint Assembly Supplement, Abstract PP11A-01.

Cook, T. L., Bradley, R. S., Stoner, J. S., and Francus, P. 2008. High Arctic Temperature Variations During the Past Five Millennia: a Varve Based Record From Lower Murray Lake, Nunavut, Canada, *Eos Transactions. AGU*, 89 (53), Fall Meeting Supplement, Abstract C54A-01.

Cook, T., Bradley, R., 2008. Sensitivity of High Arctic lake-ice conditions to climate change, 38th International Arctic Workshop, Program and Abstracts, p. 39.

Cook, T. L., Bradley, R. S., and Stoner, J. S., 2007. 4,500 Years of annual sediment accumulation recorded in Lower Murray Lake in the Canadian High Arctic, *Eos Transactions. AGU*, 88(52), Fall Meeting, Supplement, Abstract PP41A-0180.

Davies, M. H., Stoner, J. S., St-Onge, G., **Cook, T. L.**, Bradley, R. S., and Werner, A., 2007. Reconstructing Holocene Paleomagnetic Secular Variation From High Arctic Sediments, *Eos Transactions. AGU*, 88(52), Fall Meeting, Supplement.

Cook, T., Bradley, R., 2007. Controls on recent sedimentation and lamina characteristics in two adjacent High-Arctic lakes, 37th International Arctic Workshop, Program and Abstracts, p. 71.

Stoner, J. S., Francus, P., Bradley, R., Lamoureux, S., Retelle, M., Patridge, W., **Cook, T.**, and Abbott, M., 2006. Late Holocene paleo-and-environmental magnetic records from high arctic lake sediment, Geological Society of America Abstracts with Programs, vol. 38, no. 7, p. 200.

Cook, T., Patridge, W., Bradley, R., 2006. Sedimentary evidence of climate and landscape changes from Upper and Lower Murray Lakes in the Canadian High-Arctic, 36th International Arctic Workshop, Program and Abstracts, p. 53.

Cook, T., Sommerfield, K., and Wong, K.-C., 2004. Observations of Sediment Transport in the Delaware Estuary During Spring Runoff Conditions, Geological Society of America Abstracts with Programs, vol. 36, no. 2, pp. 86.

INVITED PRESENTATIONS

- 2011 SUNY Plattsburgh Center for Earth and Environmental Science, Plattsburgh, NY. “Lakes as sensitive indicators of environmental change”
- 2009 Lafayette College, Department of Geology and Environmental Geosciences. “When is average no longer average? Detecting change in instrumental, proxy, and modeled climate data”
- 2008 University of Vermont, Department of Geology. “Modern and Past Climate Change in the High Arctic: Evidence from Upper and Lower Murray Lakes, Ellesmere Island, Nunavut, Canada”

SUPERVISION OF STUDENT RESEARCH

- Ethan Yackulic, Bates College '11 – Senior thesis project on the response and recovery of forested watersheds to human disturbance
- Ian Dulin, Bates College '11 – Senior thesis project reexamining the possibility of mountain glaciers on Mount Washington, NH existing after the retreat of continental ice

PROFESSIONAL DEVELOPMENT

2008 How to Get Started in Undergraduate Research Workshop, Council for Undergraduate Research, San Francisco, CA.

SERVICE

Manuscript reviewer for Journal of Paleolimnology; Quaternary Science Reviews
Guest editor for forthcoming special issue of *Climate of the Past*

COLLEGE LEVEL TEACHING EXPERIENCE (as primary instructor)

- *Sedimentary Processes and Environments* (Bates College fall 2011, 12 students) – A core intermediate course on sedimentology and stratigraphy, taught with labs and field trips
- *Coastal & Estuarine Processes* (Bates College fall 2011, 8 students) – An upper level elective course on the physics and morphodynamics of coastal processes

- *Earth Surface Environments and Environmental Change* (Planned for spring 2012, ~50-60 students) – An introductory lab science course for majors and non majors
- *Earth's Climate: Past, Present, and Future* (Lafayette College fall 2009, 36 students) – An introductory course with labs and field trips on global climate change
- *Oceanography* (Lafayette College fall 2009, 11 students) – An intermediate level course with labs and field trips focusing on physical and geological oceanography
- *Earth System Science* (University of Vermont fall 2008, 205 students) – A large lecture course with lab that serves as an introductory course for some majors or as a distribution requirement for non-majors needing to fill a lab science requirement
- *Earth Hazards* (University of Vermont spring 2009, 165 students) – A large introductory survey course with lecture and discussion sessions designed to promote scientific literacy and foster an interest in geology among non-majors
- *Geological Oceanography* (University of Vermont spring 2009, 18 students) – An introductory course focused on geological aspects of oceanography
- *Paleolimnology* (Lafayette College spring 2010, 7 students) – an intermediate level course focused on lakes and their sedimentary deposits as a framework for investigating climate and environmental change. Course is based around a semester long field and laboratory investigation of a local lake.
- *Climate Change: The Facts, the Issues, and the Long-Term View* (Lafayette College spring 2010, 16 students) – Part of Lafayette College's Values and Science/Technology (VAST) course requirement for all sophomores. VAST courses are writing intensive courses designed to engage students in some aspect of science and its relationship with other disciplines through a combination of humanistic and scientific approaches to the topic.

SELECTED FIELDWORK

Various Lakes, MA & NH (2010 & 2011)	◦bathymetric and subbottom seismic surveying; sediment coring
Kyushu & Shikoku, Japan (2010)	◦sediment coring of coastal ponds
Deep Lake, Pennsylvania (2010)	◦bathymetric and subbottom seismic surveying; sediment coring
Raritan River Estuary, New Jersey (2009)	◦plankton sampling, water sampling, water column profiling (salinity, temperature, dissolved oxygen, pH), sediment sampling
Bald Hill Pond, Vermont (2009)	◦bathymetric and subbottom seismic surveying
Lofoten Islands, Norway (2006 & 2007)	◦bathymetric and subbottom seismic surveying, water sampling (for biochemical analyses), sediment coring of multiple lakes
Ellesmere Island, Canada (2005 & 2006)	◦bathymetric and subbottom seismic surveying, sediment coring of multiple lakes, installation of automated weather stations, deployment of automated sediment accumulation sensors
Delaware Estuary (2003 & 2004)	◦mooring deployment (for automated measurement of current velocity and suspended concentration), sediment coring, bathymetric, subbottom seismic and sonar surveying, water sampling (for suspended sediment analysis), salinity and temperature profiling, ADCP (current velocity) profiling
Mt Pinatubo, Philippines (2001)	◦river geomorphology study involving stream flow measurements, longitudinal and cross-sectional profiling, suspended sediment and bed-load sampling