

Brent M. Goehring

Lamont-Doherty Earth Observatory and Department of Earth and Environmental Science
Columbia University
61 Route 9W/PO Box 1000
Palisades, NY 10964
goehring@ldeo.columbia.edu

Education

- PhD, Geological Sciences, Columbia University, in progress.
Research Interests: Application and development of cosmogenic nuclides in climate change, surface processes.
Advisors: Joerg Schaefer and Peter Schlosser
- MS, Geology, Oregon State University, June 2006.
Thesis title: ^{10}Be Exposure ages of erratic boulders in southern Norway and implications for the history of the Fennoscandian Ice Sheet
Advisor: Edward Brook
- BS, Geological Sciences with distinction, University of Washington, August 2004.
Thesis title: Numerical Ages of Glacier Retreat at Emmons Glacier, Mt. Rainier using Lichenometry
Advisors: Derek Booth and Michael O'Neal

Professional Interests

Research: Application of terrestrial cosmogenic nuclides to questions in climate change, glacial geology, geomorphology and paleoseismology, paleoclimatology, paleoceanography. Development and manager of third operational *in situ* ^{14}C extraction lab. Refinement of *in situ* exposure dating techniques. Other interests include sedimentary provenance.

Teaching: Introduction to Geology (2004, 2005), History of the Earth (2005, 2006), Earth System Science (2005), Earth's Environmental Systems: Solid Earth (2008), Field Trip to Death Valley (2008, 2009)

Peer Reviewed Publications

- Goehring, B.M.**, Brook, E.J., Linge, H.C., and Raisbeck, G.M., 2008. Beryllium-10 Exposure ages of erratic boulders in southern Norway and implications for the history of the Fennoscandian Ice Sheet. *Quaternary Science Reviews*. 27, 320-336.
- Kelly, M.A., Lowell, T.V., Hall, B.L., Schaefer, J.M., Finkel, R., **Goehring, B.M.**, Alley, R.A., and Denton, G.H., in press. A ^{10}Be chronology of late-glacial and Holocene mountain glaciation in the Scoresby Sund region, east Greenland: Implications for seasonality during late-glacial time. *Quaternary Science Reviews*.

In Review/Prep

- Siddall, M., Kaplan, M.R., Schaefer, J.M., Putnam, A., Kelly, M.A., and **B. Goehring**, in review. The bipolar switch - changing influence of Antarctic and Greenland temperature records on sea level over the last glacial cycle. *Quaternary Science Reviews*.
- Goehring, B.M.**, Kelly, M.A., Schaefer, J.M., Lowell, T., and R. Finkel, in review. Evidence for Minimal Erosion Under the Greenland Ice Sheet Through the Last Glacial Cycle from Beryllium-10 Depth Profiles. *Journal of Geophysical Research: Earth Surface*.
- Putnam, A., Schaefer, J., Vandergoes, M., Kaplan, M., Barrell, D., **Goehring, B.M.**, Schwartz, R., Finkel, R., Kelley, S., and Denton, G., in prep. A precise beryllium-10 production-rate calibration for the Southern Hemisphere middle latitudes. *Quaternary Geochronology*.

- Goehring, B.M.**, Balco, G., Schaefer, J.M., and Licciardi, J.M., in prep. A reevaluation of cosmogenic Helium-3 and Neon-21 production rates. *Quaternary Geochronology*.
- Brook, E.J., Nesje, A., Lehman, S.J., Raisbeck, G.M., Yiou, F., and **B.M. Goehring**, in prep. Exposure Age Constraints on the Geometry and Deglaciation of the Fennoscandian Ice Sheet. *Boreas*.

Funding History

- Mary Gates Research Scholar, UW, 2004, \$3,000 (Declined Award due to graduation)
- Geology Graduate Student Research Grant, OSU, Determining Thickness Variations of the Fennoscandian ice sheet in southern Norway using cosmogenic nuclides, 2005, \$990
- LDEO Climate Center Grant, Cosmogenic dating of late glacial and Holocene moraines in the Icicle Creek/Enchantment Lakes region, Washington, LDEO Climate Center, 2006, \$6,000
- PRIME Lab Seed Grant, $^{26}\text{Al}/^{10}\text{Be}$ Measurements in Depth Profiles from east Greenland Glacial Deposits: A New Method to Understand the Duration of Glacial Advances, PRIME Lab and Purdue University, 2007, \$5,450
- NSF-SGER Grant, Quantifying subglacial erosion rates and Timing of Holocene warm periods by in-situ $^{14}\text{C}/^{10}\text{Be}$ – A proof of concept, National Science Foundations, 8/2008-9/2009, \$40,000
- LDEO Climate Center Grant, Did climate-induced changes of Holocene groundwater levels in Death Valley trigger hydrovolcanic eruptions?, LDEO Climate Center, 2008, \$8000

Invited Talks and Lectures

- Guest Lecturer on principles of surface exposure dating and cosmic rays for “Isotope Geology II”, taught by Richard Fairbanks, Columbia University, Fall 2006.
- Los Alamos National Lab EES-IGPP Seminar Series, September 2008. New Views on the Efficiency of Glacial Erosion from Cosmogenic Nuclides and the Climate Record Preserved in Bedrock and Boulders.
- Guest Lecturer on erosion/denudation rates from cosmogenic nuclides for “Geochronology & Thermochronology”, taught by Sidney Hemming, Columbia University, Fall 2008.

Conference Presentations and Abstracts

- Goehring, B.M.**, Schaefer, J.M., Lifton, N., and Jull, A.J.T., 2008. Progress and Initial Results from the Lamont-Doherty Earth Observatory *in situ* Carbon-14 Extraction Laboratory, AMS 11 Meeting.
- Goehring, B.M.**, Kelly, M.A., Schaefer, J.M., Lowell, T.V., and Finkel, R.C., 2008. Cosmogenic Nuclide Inheritance and Surface Ages of Glacial Geomorphologies in Scoresby Sund, east Greenland. AMQUA 2008 Biennial Meeting.
- Goehring, B.M.**, Schaefer, J.M., and Kelly, M.A., 2007. Constraining Glacial Chronologies Using Beryllium-10 Exposure Age Depth Profiles. AGU 2007 Fall Meeting.
- Goehring, B.M.**, Brook, E.J., Linge, H.C., and Raisbeck, G.M., 2006. Transitions in glacial erosion under a thick Fennoscandian ice sheet: Evidence from cosmogenic nuclides. EOS, Trans. AGU, 87(52), Fall Meeting Suppl., Abstract C33A-1255.
- Jean, J., Burks, T., Danoff, M.E., **Goehring, B.M.**, Reynolds, J.H., 2003. GSA'S FIRST STUDENT ORIENTED GEOVENTURES TRIP: ICELAND—2002. Abstracts with Programs-Geological Society of America, 35(4), 82.
- Goehring, Brent M.**, 2003. Numerical Ages of Glacier Retreat at Emmons Glacier, Mount Rainier using Lichenometry. Abstracts with Programs-Geological Society of America, 35(6), 425.

Awards and Honors

- Fuller Scholarship in Earth Sciences, UW, 2003
- Robbins Field Camp Scholarship, UW, 2004

- Taubeneck Fellowship, OSU, 2004
- Mundorff Fellowship, OSU, 2005
- Outstanding Graduate Teaching Assistant, OSU, 2006
- Faculty Fellow, CU, 2006-2007
- NSF CRONUS-Earth Graduate Research Fellowship, 2007-2010
- NSF CRONUS-Earth/CRONUS-EU International Fellowship, 2007
- Goodfriend Prize, CU, 2008

Professional Affiliations

- American Geophysical Union
- Geological Society of America
- American Quaternary Association

Professional Service

UW ESS Curriculum Committee Undergraduate Representative, 2003-2004

OSU Geosciences Seminar Speaker Committee Member, 2005

Cosmogenic Nuclide Lab Manager, OSU, 2004-2006

In situ ¹⁴C Lab Manager, LDEO, 2006-Present

Web Advisory Committee, LDEO, 2008-Present

Excellence in Mentoring Award Committee, 2008-Present

CRONUS-Earth Steering Committee, 2008-Present

Reviewer For: National Science Foundation, Quaternary Research

Teaching Experience

- Teaching Assistant for Introduction to Geology Fall 2004 and Fall 2005. Lead laboratory exercises for approximately 30 students per class. Responsible for grading lab assignments, exams, and essays.
- Teaching Assistant for Earth System Science Winter 2005. Taught two lab sections for approximately 30 per class. Responsible for grading lab assignments and exams. Assisted in development of laboratory exercises. Lead field trip to Oregon Coast to look at Tertiary Stratigraphy and active geomorphology.
- Head teaching assistant for History of Earth during Spring 2005 and Spring 2006. In charge of two teaching assistants, as well as developing and setting up lab exercises. Taught total of five classes with 30 students per class. Gave main course lectures when needed and lead field trip to Eastern Oregon. Responsible for grading assignments and lab exercises.
- Teaching Assistant for Earth System Science: The Solid Earth at Columbia University for Fall 2007. Duties include grading labs and homework, running lab and giving lab lecture, setting up and developing labs. Also assist in the development of co-TA who has no previous teaching experience.
- Teaching Assistant for field trip to Death Valley, Spring 2008, 2009. My duties were to assist the faculty in pre-trip preparation of the students and pre-trip logistics. However, my main duties were during the field trip when I assisted with logistics and answering student questions while in the field. I also gave some short lectures on the geomorphology of the Death Valley region.

Recent Collaborators

Greg Balco, Berkeley Geochronology Center; Edward Brook, Oregon State Univ; Marc Caffee, Purdue Univ.; Peter Robert Finkel, UC-Berkeley; Brenda Hall, Univ. Maine; A.J. Timothy Jull; Univ. Arizona; Meredith Kelly, Dartmouth Univ; Joe Licciardi, Univ. New Hampshire; Nat Lifton, Univ. Arizona; Henriette Linge, Univ. Bergen; Thomas Lowell, Univ. Cincinnati; Jan Mangerud, Univ. Bergen; Shaun Marcott, Oregon State Univ.; Atle Nesje, Univ. Bergen; Grant Raisbeck, CNRS; Christian Schluechter,

Univ. Bern; John-Inge Svendsen, Univ. Bergen; Françoise Yiou, Centre de Spectrométrie Nucléaire et de Spectrométrie de Masse

Outreach

Oregon State University Discovery Days, April 2005

Discovery Days is a public community event hosted by the university. The university invites local schools as well as city residents to come and learn about research and/or themes selected by the various departments on campus. Geosciences selected the topic “Volcanoes in Our Backyard.” My participation in the event included constructing a poster on volcanic eruptions and climate change and answering questions for students, teachers, and community members.

Lamont-Doherty Earth Observatory Open House, October 2006, 2007, 2008

Open house is a day-long event where Lamont is open to the general public to explore the campus, facilities, and visit booths where scientists display their research and provide demonstrations of basic scientific principles. Much of the research is local in nature, providing a strong connection to the neighboring communities. My part the past three years has been participation in the booth set up by the LDEO Exposure Dating group.