

Kathleen (Kat) Huybers

Pacific Lutheran University
Department of Geosciences
Rieke, Room 158
Tacoma, WA 98447

Phone: (617) 233-2826
kat.huybers@gmail.com
<http://students.washington.edu/khuybers/>

Education

- ★ Ph.D. Earth and Space Sciences, University of Washington, June 2014.
- ★ M.S. Geophysics, University of Washington, 2007.
- ★ B.S. Mathematics, University of San Francisco, 2003.
 - *Minor*: Philosophy
 - *Honors*: Magna Cum Laude

Teaching Experience

Higher Education

★ Pacific Lutheran University: Visiting Assistant Professor

Department of Geosciences and Department of Environmental Studies
Conservation of Natural Resources Fall 2014 and Spring 2015. *Global Climate Change* January 2015.

★ Colorado College: Co-Instructor

Department of Environmental Science
Global Climate Change
April 2011.

- Organized and led lessons, lectures, examinations, field trips for an introductory course on climate.
- Graded assignments, met with students individually, and guided students through scientific literature.
- Helped students create scientific posters, which they displayed as part of their final projects.
- Helped secure a *NOAA* internship for a student, following a field trip that I organized to *NOAA*'s Boulder facility.

★ University of Washington: Teaching Assistant

Department of Earth and Space Sciences

- *Earth and Space Sciences 310, Mathematical Methods in the Earth Sciences*
March –June 2014.
 - Developed and graded homework assignments.
 - Created and maintained class website.
 - Acted as primary lecturer for one week of the quarter.

- *Earth and Space Sciences 431, Principles of Glaciology and 505, The Cryosphere*
September–December 2013.
 - Ran lab discussion session, created supplementary lectures and problem sets.
 - Led field trip to Mount Baker, Washington.
 - Graded assignments and exams.
- *Earth and Space Sciences 101, Introductory Geology*
September–December 2005 & January–March 2007.
 - Ran lab session, which involved creating introductory lectures, and assisting with assignments.
 - Led field trips.
 - Graded assignments.

★ **University of Washington: Seminar Organizer**

Program on Climate Change Graduate Student Seminar

- *Everything You Ever Wanted to Know About Climate But Were Too Afraid to Ask: Part II*
January–March 2013.
 - Organized and delegated graduate presentations on confusing but fundamental aspects of the climate system.
 - Created and maintained course dropbox.
- *Mid-Holocene African Aridity: Reconciling Climate Dynamics with Observations of the African Humid Period*
January–March 2006.
 - Organized, and delegated graduate presentations on the greening of the Sahara, approximately 5000 years before present.
 - Created and maintained course website.

★ **University of San Francisco: Supplemental Instructor**

Learning and Writing Center

Statistics

September 2001–June 2003.

- Ran review sessions for Introductory Statistics courses, which involved lecturing and assisting with homework assignments.
- Created and administered practice exams.

★ **University of San Francisco: Teaching Assistant**

Department of Mathematics

Calculus I

September–June 2000.

- Ran review sessions for Calculus I course
- Taught associated lab section, which was based on *Mathematica* programming.
- Graded assignments.

Junior High

★ **Ursuline Academy: Teacher**

Algebra and Pre-Algebra

August 2003–June 2004.

- Created and taught original lesson plans, tests, and homework assignments to prepare students for the next steps in their mathematical education.

- Emphasized creative problem solving by introducing mathematical puzzles to the daily lecture. This was balanced by allowing students to practice on sets of similar problems, until they were confident that they had mastered a concept.
- Mediated as necessary with students and their parents.

Research Experience

University of Washington, Department of Earth and Space Sciences

★ PhD Thesis

Relationships Between Climate and Geophysical Processes: What Climate Histories Can Be Inferred from Glaciers, Lakes, and Ice Streams?

Advisers: Gerard Roe, Howard Conway

January 2010–June 2014.

- **Macro-Scale Stability of West Antarctic Ice Sheet**

Colleagues: Gerard Roe, Howard Conway, Greg Balco, Claire Todd

January 2010–present.

- Use an ice-flow model to assess the stability of West Antarctic ice streams to physical or environmental perturbations.
- Model results emphasize that basal topography underlying the ice determines the timing and magnitude of the ice's response.

- **Lake Level Variability in a Closed Basin System**

Colleagues: Summer Rupper and Gerard Roe

October 2009–present.

- Created a hierarchy of models that constrain temporal and spatial lake level variations in response to interannual climate variability.
- Results show that lake levels vary on at lower frequency than their forcing; the response frequency is determined by the lake's geometry and the mean climate.

- **Geometric Influences on Glacier Length Fluctuations**

Colleagues: Gerard Roe and Ed Waddington

Jan 2010–Jan 2011.

- Quantified the expected correlation between glacier advances and retreats, under a given climate regime, and specified range of glacier geometries.
- Showed that slope of the underlying bed controls the rate, frequency, and magnitude of glacier advance and retreat.

★ Research Project

What Would Happen to the General Circulation of the Atmosphere if the West Antarctic Ice Sheet Collapsed?

Adviser: Dargan Frierson

May 2013–present.

- Calculated changes in wind, energy transport, precipitation, and pressure fields in response to changes in the distribution of topography in the Antarctic.
- Used an idealized aquaplanet Global Climate Model with topographic variations over the Antarctic continent.

★ Master's Project

Glacier Variations in Response to Interannual Climate Variations

Advisers: Gerard Roe and Bernard Hallet

September 2005–June 2007.

- Created an idealized linear glacier model to constrain temporal and spatial mountain glacier advance and retreat in response to interannual climate variability.
- Calculated sensitivity to variations in precipitation vs. temperature.
- Created a mathematical framework to calculate best-case correlations of regional glacier advance and retreat.

★ Field Work

Last Glacial Maximum and Deglaciation Chronology for the Foundation Ice Stream and Southeast Weddell Sea Embayment.

Advisers: Greg Balco and Claire Todd

December–January, 2010/2011 and 2011/2012.

- Our team of six spent two field seasons at the margins of the Foundation Ice Stream, West Antarctica.
- Prepared, collected, and processed GPS measurements of velocity stakes.
- Planned and drilled shallow ice cores for water isotope analysis.
- Assisted in the collection of glacial erratics and ice-penetrating radar.

Isotopic ratios in gas-phase HNO₃ and snow nitrate at Summit, Greenland..

Advisers: Eric Steig and Julia Jarvis

March–April 2006 and July 2007.

- Collected atmospheric samples and maintained instrumentation at Summit Station, Greenland.

Summit Station, Greenland

★ Summit Station Science Technician

CH2MHill, Polar Field Services &

National Oceanic and Atmospheric Administration, Earth System Research Laboratory.

February–April 2008 and November 2008–June 2009.

- This work was performed at a remote scientific research station atop the Greenland ice sheet. Teams consisted of 4-5 people, who worked together to maintain the camp and the scientific data collection.
- Maintained and sampled data for atmospheric, accumulation and chemical experiments for a range of international universities and governmental agencies.
- Data collection involved the use of gas chromatography, ozone balloon profiles, surface snow sampling, and ground-truthing of satellite measurements.

Publications & Presentations

Publications

- ★ **Huybers, K.** and Roe, G.H. (2009) Spatial patterns of glaciers in response to spatial patterns in regional climate, *Journal of Climate* Volume 22, Issue 17 pp. 4606-4620.
- ★ Campbell, S., Balco, G., Todd, C., Conway, H. **Huybers, K.**, Simmons, C., and Vermeulen, M. (2013) Radar-detected englacial stratigraphy in the Pensacola Mountains, Antarctica: implication for recent changes in ice flow and accumulation, *Annals of Glaciology* Volume 54, Issue 63 pp. 91-99.
- ★ **Huybers, K.** Roe, G.H., and Conway, H. Macro-scale topographic controls on the stability of the West Antarctic Ice Sheet, *in prep.*
- ★ **Huybers, K.** Rupper, S., and Roe, G.H. Lake level variability in response to interannual climate variability, *in prep.*

Selected Presentations

★ **Poster Presentation**

The timing and magnitude of lake-level variability, in response to interannual climate variability

Huybers, K., Rupper, S., and Roe, G.

American Geophysical Union Fall Meeting

San Francisco, CA, December 9-13, 2013.

★ **Oral Presentation**

What would happen to the general circulation of the atmosphere if the West Antarctic Ice Sheet collapsed?

Huybers, K., Steiger, N., and Frierson, D.

Graduate Climate Conference

Woods Hole, MA, November 1-3, 2013.

★ **Oral Presentation**

Linkage between Grounding Line Dynamics and Geological Observations in the Weddell Sea Sector of Antarctica

Huybers, K., Roe, G., Conway, H., Balco, G. and Todd, C.

American Geophysical Union Fall Meeting

San Francisco, CA, December 3-7, 2012.

★ **Poster Presentation**

Linkage between Grounding Line Dynamics and Geological Observations in the Weddell Sea Sector of Antarctica

Huybers, K., Roe, G., Conway, H., Balco, G. and Todd, C.

Graduate Climate Conference

Pack Forest, WA, October 26-28, 2012.

★ **Oral Presentation**

Linkage between Grounding Line Dynamics and Geological Observations in the Weddell Sea Sector of Antarctica

Huybers, K., Roe, G., Conway, H., Balco, G. and Todd, C.

West Antarctic Ice Sheet Meeting

Pack Forest, WA, September 19-21, 2012.

★ **Oral Presentation**

Lake Level Changes in Response to Interannual Climate Variability

Huybers, K., Roe, G., and Rupper, S.

Earth and Space Sciences Research Gala

Seattle, WA, March 29-30, 2012.

★ **Poster Presentation**

Geometric Influences on Glacier Variation and Correlation

Huybers, K., Roe, G., and Waddington, E.

Graduate Climate Conference

Woods Hole, MA, October 28-30, 2011.

★ **Oral Presentation**

Huybers, K., Roe, G., and Waddington, E.

Geometric Influences on Glacier Variation and Correlation

Northwest Glaciologists Meeting

Portland, OR, October 13-15, 2011.

★ **Oral Presentation**

Huybers, K., Rupper, S., and Roe, G.

Lake Level Changes in Response to Interannual Climate Variability

Graduate Climate Conference

Pack Forest, WA, October 15-17, 2010.

★ **Oral Presentation**

Huybers, K. and Roe, G.
Spatial Patterns in Glaciers in Response to Spatial Patterns in Climate
 Climate, Glaciers, Society Mini-Conference
 Lamont-Doherty Earth Observatory, November 11-13, 2009.

★ **Oral Presentation**

Huybers, K. and Roe, G.
Understanding Glaciers as an Indication of Regional Climate Variability.
 American Geophysical Union, Fall Meeting
 December 2006.

Awards & Fellowships

★ **Robert and Nadine Bassett Fellowship**

University of Washington Department of Earth and Space Sciences
 2013–2014 academic year

- Merit award that provides one quarter of research fellowship support.

★ **Ferrel Fund Geological Sciences Research Award**

University of Washington Department of Earth and Space Sciences
 2012–2013 academic year

- Monetary stipend to pursue research.

★ **Communication Fellow**

Seattle Pacific Science Center
 February 2010 – present

- Took a course in communicating my research to the public in interesting and accessible ways.
- Created and developed a hands-on exhibit connecting ice-sheet loss to sea-level rise. I periodically show this exhibit at the Pacific Science Center *see Service Activities, below.*

★ **Program on Climate Change Fellow**

University of Washington Program on Climate Change
 2004–2005 academic year

- Full tuition and stipend paid for an academic year, for promising students who study climate science.

★ **Merit Scholar**

University of San Francisco
 1999–2003 academic years

- 75 percent of tuition was awarded, based on academic performance.

★ **Dean's List**

University of San Francisco.
 1999–2003.

Professional & Service Activities

★ **Peer-reviewer for journal articles.**

★ **Co-chair of Graduate Climate Conference organizing committee**

Graduate Climate Conference VI
 November 2011–October 2012

- Organized the sixth Graduate Climate Conference, which was held at Pack Forest, Eatonville, WA, on October 26-28, 2012.

- Helped secure a \$10,000 grant from the National Science Foundation. This money went to travel fellowships for participants.
- Fundraising efforts allowed us to host the conference free of charge to the 96 attendees, who represented 37 different academic institutions across 19 US states and three foreign countries. Many were also awarded travel fellowships.
- Oversaw and worked with other volunteers on all aspects of the organization: advertisement, abstract submission and selection, fundraising, communication with attendees, interfacing with the conference center, and documenting the scientific program.

★ **Sierra Club's Seattle Inner City Outings Leader**

September 2005–December 2007 & January 2010–Present.

- Inner City Outings provides opportunities for urban youth in the Seattle area to explore, enjoy and protect the natural world.
- I organize and/or lead monthly field trips for 10-15 elementary school children in a low-income neighborhood.
- We go canoeing, hiking, snowshoeing, and cross-country skiing, among other activities.
- Served as team lead for the 2006-2007 and 2013-2004 academic years.

★ **Seattle Public Library Homework Helper**

September 2012–June 2103.

- Twice monthly, I provided drop-in homework help and tutoring at the local library, helping students from kindergartners to community-college attendees.

★ **Pacific Science Center Science Communication Fellow**

February 2010 – present.

- With the exhibit that I created during my fellowship, I explain ice-sheet and sea-level connections to museum visitors, at Polar Science Weekend and Scientist Spotlight events.
- Visitors range from school groups to curious adults.

★ **Graduate Student Representative to the Faculty**

University of Washington, Department of Earth and Space Sciences
2010-2011 academic year.

- Attended and took notes at monthly faculty meetings.
- Acted as a liaison between faculty and graduate students.
- Assigned offices to incoming graduate students.

★ **Member, American Geophysical Union**

2004–2007, 2009–Present.

★ **Member, University of Washington Program on Climate Change**

2004–Present.

Workshops Attended

★ **Advanced Climate Dynamics Courses**

Dynamics of the Last Deglaciation
Nyksund, Norway, August 19–31, 2013.

★ **Advanced Climate Dynamics Courses**

Ice Sheet–Ocean Interactions
Lyngen, Norway, June 8–June 19, 2010.

★ **Climate, Glaciers, Society Mini-Conference**

Lamont-Doherty Earth Observatory, November 11-13, 2009.

- ★ **University of Washington Program on Climate Change Summer Institute**
Atmosphere-Ocean-Ice Shelf Interactions
San Juan Island, WA, September 16–18, 2012.
- ★ **University of Washington Program on Climate Change Summer Institute**
The Water Cycle in a Changing Climate
San Juan Island, WA, September 14–16, 2011.
- ★ **University of Washington Program on Climate Change Summer Institute**
Anthropogenic CO₂ Emissions: Projections, Mitigating Technologies and Policies
Leavenworth, WA, September 20–23, 2006.
- ★ **University of Washington Program on Climate Change Summer Institute**
El Niño: Past, Present and Future
Leavenworth, WA, September 18–21, 2005.

Last updated: October 1, 2014