Curriculum Vitae

Gerard H. Roe
Associate Professor,
Dept. of Earth and Space Sciences,
University of Washington, Seattle, WA.

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Ph.D. in Atmospheric Science, June 1999. Dissertation under Prof. Richard Lindzen: "The mutual interaction between the great continental ice sheets and atmospheric stationary waves".

Oriel College, University of Oxford, Oxford, UK
Bachelor of Arts degree in Physics. First Class Honors, June 1992.

PROFESSIONAL EXPERIENCE

September 2007 to present: Associate Professor, Seattle, WA
January 2003 to 2007: Assistant Professor
University of Washington, Department of Earth and Space Sciences,
Adjunct Associate Professor, Dept. of Atmospheric Sciences

September 1999 to December, 2002: Postdoctoral Researcher, Seattle, WA
University of Washington, Quaternary Research Center/Joint Institute for The Study of the Atmosphere and Ocean.

September 1993 – March 1999: Graduate Research Assistant, Cambridge, MA
March 1999 – July 1999: Post-doctoral Associate, Massachusetts Institute of Technology, Program in Atmospheres, Oceans, and Climate

CLASSES TAUGHT

ESS/ATM/OCN 589: Paleoclimate, Spring, 2011
ESS 201: The Earth system and climate, Winter, 2009, 2010
ESS exploration seminar Denmark and Greenland, August, 2008
ESS 590: Landscapes and Climate, Spring 2009
ENVIR 511 512: Graduate certificate in environmental management, City of Bellevue action plan for community greenhouse gas reduction, Winter, Spring 09
ESS 314: Geophysics: expedition to planet Earth, Winter 2004, Fall, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011
PCC/ATM/OCN/ESS 587: Climate dynamics, Fall 2003, 2004, 2005, 2006, 2007, 2008

ESS 416/516: Geophysics: the atmosphere, Spring 2003, 2004, 2005, 2006.
ESS 590: Special topics in climate: Heinrich events (seminar). Fall 2003, Winter, Spring 2004. Centennial variability (seminar), Winter 2005; African aridity (seminar), Winter, '06; The Holocene Express, Winter 2007.
ESS/ATM 590: Knowability and no ability in climate and earth sciences (seminar), Spring '06, '08, '09
PCC 586: That sinking feeling: the thermohaline circulation (seminar). Spring, 2005.
ESS 534/ATM 514: Ice and climate modeling, Winter 2001.
ESS 431: Principles of glaciology (5 lecture model ice dynamics), Fall 2003.

GRADUATE ADVISEES

Alison Anders (ESS, PhD, 2005, Asst Prof., U. Illinois)[!], Michael O'Neal (ESS, PhD, 2005, Asst. Prof, U. Delaware)[!], Drew Stolar (ESS, PhD, 2006, GE, Connecticut)[!], Noah Finnegan (ESS, PhD, 2006, Asst. Prof., UCSC)[!], Summer Rupper (ESS, MSc, 2004; ESS, PhD, 2007, Asst. Prof., BYU)*, Camille Li (ATM, PhD, 2007, Postdoc, U. Bergen)[#], Kevin Rennert (ATM PhD 2007, Staffer, Energy Committee, US Senate)[!], Kat Huybers (ESS, MSc 2007, PhD candidate)*, Jane Locke (ESS PhD 2008, Chevron) [#], Jim Lutz (CFR PhD 2008, Scientist, CFR)[#], Robert Sheerer (ESS, MSc 2008)[#], Eric Buer (ESS, MSc 2008)[#], Jennifer Adams (CivE PhD 2007) [#], Justin Minder (ATM PhD , 2010, Postodc, Yale)*, Kevin Wood (ESS PhD, 2010, scientist PMEL), Sandra Penny (ATM PhD candidate)*, Michelle Koutnik (ESS PhD 2010, Postdoc, UCopenhagen)[#], Ted Bohn (CivE PhD candidate) [#], Rachel Headley (ESS, PhD 2011, postdoc U. Tubigen)[!], Erin Burke (ESS PhD candidate)*, Nichole Feldl (At. Sci. PhD candidate)*, Angela Pendergrass (At. Sci. PhD candidate)*, Kyle Armour (Physics, PhD candidate)[!], Brian Smoliak (At. Sci., PhD candidate)*, Nicholas Siler (At. Sci, PhD candidate)*, Nathan Steiger (At. Sci., PhD candidate)

*formal advisor, [!]major research advisor, [#]committee member (some research input)

PUBLICATIONS

In preparation:

Roe., G.H., and M.B. Baker, 2011: Paleoclimate proxies, extreme events, and the climate continuum, *in preparation.*

Burke, E.M., G.H. Roe, 2011: The persistence of climate memory in glacier forcing, i*n preparation.*

Roe, G.H., and D.S. Battisti, 2011: Knowability and no ability in climate and earth sciences, *in preparation*.

Huybers, K.H., S.B. Rupper, and G.H. Roe, 2011: Lake level response to natural and forced variability, a case study of Great Salt Lake. *In preparation.*

Penny, G.H., G.H. Roe, and D.S. Battisti, 2011: Interannual variability of the Pacific storm track. *In preparation.*

Roe, G.H., 2011: Costing the Earth: a numbers game, or a moral imperative? *In preparation.*

Submitted:

Roe, G.H., and Y. Bauman, 2011: Should the climate tail wag the policy dog? *submitted*.

Headley, R., G.H. Roe, and B. Hallet, 2011: Comparing observed and modeled velocities in Seward throat: implications for erosion beneath fast-moving ice streams, *submitted*.

Headley, R., G.H. Roe, and B. Hallet, 2011: Analytical solution of glacier-bed profiles, and comparison with observations, *submitted*.

Published/in press (peer-reviewed):

Roe, G.H. K.C. Armour, 2011: How sensitive is climate sensitivity? *Geophys*. Res. Lett., *in press.*

Roe, G.H., 2011: What do glaciers tell us about climate variability and climate change? *J. Glaciology, in press*.

Roe, G.H., and M.B. Baker, 2011: Comment on "Another look at climate sensitivity". *Nonlinear Processes in Geophysics,* **18**, 125-127, doi:10.5194/npg-18-125-2011.

Minder, J.R., D.R. Durran, and G.H. Roe, 2011: Mesoscale controls on mountainside snowline. *J. Climate, in press.*

Pendergrass, A.G., G.J. Hakim, D.S. Battisti, and G.H. Roe, 2011: Coupled mixed-layer temperature predictability for climate reconstruction. *J. Climate, in press.*

Penny, S. M. , G.H. Roe, and D.S. Battisti, 2011: Reply to Comments on "The Source of the Midwinter Suppression in Storminess over the North Pacific" *J. Climate*, in press

Armour, K., G.H. Roe, 2011: Climate commitment in an uncertain world. *Geophys. Res. Lett.*, **38**, doi:10.1029/2010GL045850.

Feldl, N., and G.H. Roe, 2011: The shape of daily precipitation in the American West as a function of ENSO. *J. Climate*, **24**, 2483-2499.

Feldl, N., G.H. Roe, 2010: Synoptic patterns associated with intense La Nina precipitation in the southwestern United States, *Geophys. Res. Lett.*, **37**, L23803, doi:10.1029/2010GL045439

Roe, G.H., and M.T. Brandon, 2010: Critical form and feedbacks in mountain belt dynamics: the role of rheology. J. Geophy. Res., **116**, B02101, doi: 10.1029/2009JB006571.

Roe, G.H., 2010: Knowability and no ability in climate projections. *Report prepared for the Environmental Protection Agency. National center for environmental economics report no. 0564. Available at http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0564-117.pdf.*

Roe, G.H., and M.B. Baker, 2010: Notes from a catastrophe - the descent into a snowball Earth. *J. Climate*, **22**, 4574-4589

Dayem, K, D.S. Battisti, G.H. Roe, P. Molnar, 2010: Lesssons learned from the modern monsoon applied to the interpretation of paleoclimate records. *Earth. Plan. Sci. Lett.*, **295**, 219–230.

Penny, S.M., G.H. Roe, and D.S. Battisti, 2010: The source of the midwinter suppression of the Pacific storm track. J*. Climate*, **23**, 634-648.

Roe, G.H. and M.A. O'Neal, 2009: The response of glaciers to intrinsic climate variability: observations and models of late Holocene variations. *J. Glaciology*, **55**, 839-854.

Minder, J.U., G.H. Roe, and D.R. Montgomery, 2008: Spatial patterns of rainfall and landslide hazard, *Water Resources Research*, **45**, W04419.
Huybers, K.M., and G.H. Roe, 2009: Glacier response to regional patterns of climate variability. *J. Climate*, **22**, 4606-4620.
Baker, M.B., and G.H. Roe, 2009: The shape of things to come: why is climate change so predictable? *J. Climate*, **22**, 4574-4589.
Rupper, S.B., G.H. Roe, and A. Gillespie, 2009: Spatial patterns of glacier advance and retreat in Central Asia in the Holocene. *Quat. Res.*, **72**, 337-346.
Minder, J.U. and G.H. Roe, 2009: Precipitation in mountainous terrain. To appear in the Encyclopedia of Snow, Ice and Glaciers. Edited by U.K. Haritashya, V. Singh, and P. Singh, Springer Press.
Roe, G.H., 2009: Feedbacks, time scales, and seeing red. *Annual Reviews of Earth and Planetary Sciences*, **37**: 93-115.
Roe, G.H., 2008: On the paleoclimate interpretation of Chinese loess. *Quat. Res.*, **71**, 150–161.
Galewsky, J., and G.H. Roe, 2008: Climate over landscapes: The emerging links between geomorphology and the atmospheric sciences. *White paper, submitted to the National Research Council*.
Roe, G.H., K.X. Whipple, J.K. Fletcher, 2008: Feedbacks between climate, erosion, and tectonics in a critical wedge orogen. *Amer. J. Sci.*, **308**, 815–842.
Minder, J.U., D.R. Durran, and G.H. Roe, A.M. Anders, 2008: The climatology of small-scale orographic precipitation over the Olympic mountains: Patterns and processes. *Quat. J. Roy. Met. Soc.*, **134**, 817-839.
Rennert, K., G.H. Roe, C.M. Bitz, J. Putkonen, and D. Fischer, 2008: Rain-on-snow in the circumpolar Arctic: climatology and impacts. *J. Climate*, doi: 10.1175/2008jcli2117.1
Anders, A.M., and G.H. Roe, D.R. Montgomery, and B. Hallet, 2008: Coupled evolution of topography and orographic precipitation in varied climates. *Geology*, **36**, 479-482.
Rupper, S.B., and G.H. Roe, 2008: Glacier changes and regional climate – a mass and energy balance approach. *J. Climate*, **21**, 5384- 5401.
Owen, L.A., G. Thackaray, R.S. Anderson, J. Briner, D. Kaufman, G.H. Roe, W. Pfeffer, and C. Yi, 2008: Integrated research on mountain glaciers: Current status, priorities and future prospects. *Geomorphology*, doi:10.1016/j.geomorph.2008.04.019.
Roe, G.H., and M.B. Baker, 2007: Why is climate sensitivity so unpredictable? *Science*, **318**, 629-632.
Stolar, D.R., G.H. Roe, and S.D. Willett, 2007: Controls on the patterns of topography and erosion rate in a critical orogen at steady state, *J. Geophys. Res.*, **112**, F04002.
Tomkin, J.T., and G.H. Roe, 2007: The response of a glaciated critical wedge orogen to changes in climate. *Earth. Plan. Sci. Lett.*, **262**, 385–397.
Anders, A.M., G.H. Roe, D.R. Durran, and J.R. Minder, 2007: Small-scale spatial gradients in climatological precipitation on the Olympic Peninsula. *J. Hydromet.*, **8**, 1068-1081.
Roe, G.H., 2006: In defense of Milankovitch. *Geophys. Res. Lett.* **33**, L24703, doi: 10.1029/2006GL027817.
Roe, G.H., D. Stolar, and S.D. Willett, 2006: The sensitivity of a critical wedge orogen to climatic and tectonic forcing. in: S.D. Willett, N. Hovius, M. Brandon, D.M. Fisher,

(Eds), *Tectonics, Climate, and Landscape Evolution: Geological Society of America Special Paper 398*, Geological Society of America, Boulder, CO, 227-239.
Roe, G.H., and M. Baker, 2006: Microphysical and geometrical controls on the pattern of orographic precipitation. *J. Atmos. Sci.*, **63**, 861–880.
Stolar, D., G.H. Roe, and S.D. Willett, 2006: Evolution of a critical orogen under various forcing scenarios: findings from a numerical sandbox. in: S.D. Willett, N. Hovius, M. Brandon, D.M. Fisher, (Eds), *Tectonics, Climate, and Landscape Evolution: Geological Society of America Special Paper 398*, Geological Society of America, Boulder, CO, 240-250.
Anders, A.M., G.H. Roe, B. Hallet, D.R. Montgomery, N. Finnegan, and J. Putkonen, 2006: Spatial patterns of precipitation and topography in the Himalaya. in: S.D. Willett, N. Hovius, M. Brandon, D.M. Fisher, (Eds), *Tectonics, Climate, and Landscape Evolution: Geological Society of America Special Paper 398*, Geological Society of America, Boulder, CO, 39-53.
Finnegan, N., G.H. Roe, D.R. Montgomery, B. Hallet, 2005: A scaling relationship for channel width in bedrock rivers. *Geology*, **33**, 229-232.
Roe, G.H., 2005: Orographic precipitation. *Annual Review of Earth and Planetary Sciences*, **33**: 645-671.
Anders, A.M, G.H. Roe, and D.R. Durran, 2004: Conference notebook Orographic precipitation and the form of mountain ranges. *Bulletin of the American Meteorological Society.* **85**, 498-499.
Roe, G.H., and E. J. Steig, 2004: On the characterization of millennial-scale climate variability. *J. Climate*, **17**, 1929-1944.
Bitz, C.M., and G.H. Roe, 2004: A physical explanation for the high rate of sea-ice thinning in the Arctic Ocean. *J. Climate*, **17**, 3623-3632.
Rupper, S., E.J. Steig, and G.H. Roe, 2004: On the relationship between snow accumulation at Mt. Logan, Yukon, and climate variability in the North Pacific. *J. Climate*. **17**,4724-4739.
Roe, G.H., D.R. Montgomery, and B. Hallet, 2003: Orographic climate feedbacks on the relief of mountain ranges. *J. Geophys. Res.*, **108**, doi:10.1029/2001JB001521.
Putkonen, J., and G.H. Roe, 2003: Rain-on-snow events, soil temperatures, and the sensitivity of ungulates to climate change. *Geophys. Res. Lett.*, **30**, doi: 10.1029/2002GL016326.
Roe, G.H., 2002: Modeling orographic precipitation over ice sheets: an assessment over Greenland. *J. Glaciology*, **48**, 70-80.
Roe, G.H., D.R. Montgomery, and B. Hallet, 2002: Effects of orographic precipitation variations on the concavity of steady-state river profiles. *Geology*, **30**,143-146.
Risbey, J.S., P.J. Lamb, R.L. Miller, M.C. Morgan, and G.H. Roe, 2002: Elucidating the structure of regional climate scenarios by combining synoptic and dynamic guidance and GCM output. *J. Climate*, **15**, 1036-1050.
Roe, G.H., and R.S. Lindzen, 2001: The mutual interaction between continental-scale ice sheets and atmospheric stationary waves. *J. Climate*, **14**, 1450-1465.
Roe, G.H., and R.S. Lindzen, 2001: A one-dimensional model for the interaction between ice sheets and atmospheric stationary waves. *Climate Dynamics*, **17**, 479-487.

Roe, G.H., and M.R. Allen, 1999: Competing explanations for the 100,000-yr ice age cycle. *Geophys. Res. Lett.*, **26**, 2259-2262.

Lindzen, R.S., and G.H. Roe, 1997: The effect of concentrated PV gradients on stationary waves: correction, *J. Atmos. Sci.*, **54**, 1815-1818.

Roe, G.H., and R.S. Lindzen, 1996: Baroclinic adjustment in a two level model with barotropic shear, *J. Atmos. Sci.*, **53**, 2749-2754.

INVITED SEMINARS, TALKS, AND COURSES:

2011:

Imperial College London, Dept. Seminar, The role of the tectonic governor in mountain belt dynamics, London, January, 2011

University College London, Was there a little ice age? Dept. Seminar, London, February, 2011.

Environmental Protection Agency, Second Climate Damages Workshop, Washington, D.C., January, 2011.

Stockholm University, Dept. of Meteorology, Was there a little ice age? Dept. Seminar, May 2011.

ICDP Workshop, Lake Issy-kul, Kyrgyzstan, The climate of Central Asia, June, 2011

International Association of Cryospheric Sciences, What do glaciers tell is about climate variability and climate change? Melbourne, July 2011.

2010:

Environmental Protection Agency, Climate Damages Workshop, Washington D.C., Knowability and no ability in climate projections. Nov. 2010

Graduate Climate Conference, Pack Forest, Oct. 2010, Keynote speaker

Yale University, Directions in Crustal Geosciences Workshop: Geodynamics principles, not first principals are the principal route to progress, October, 2010

NSF Himalaya-Karakoram-Tibet Workshop, San Francisco, June 2010: Climate over Asia and Tibet, not just a simple monsoon.

American Institute for Chemical Engineers, First sustainability institute Seattle, May 2010: Climate change: certainties and uncertainties

Penn State University, Earth Science department colloquium, March, 2009: Was there a little ice age?

2009:

Gilbert Club, University of California at Berkeley, December 2009: The tectonic governor and the downsizing of the Alps

American Geophysical Union Fall Meeting, December 2009: The interpretation of Chinese Loess as a paleoclimate proxy.

American Geophysical Union Fall Meeting, December 2009: Notes on a catastrophe: the descent into a snowball Earth.

Brown University, Geology department colloquium, October 2009. Department colloquium. The shape of things to come: what are the potentials and potential limits to global climate predictions?

Brown University, Geology department seminar, October 2009. Natural variability of glaciers in a constant climate.

University of Delaware, Geography department colloquium, April, 2009. The shape of things to come: what are the potentials and potential limits to global climate predictions?

University of Delaware, Geography department seminar, April, 2009. Was there a little ice age?

Yale University, Dept. seminar, April, 2009: Extreme weather and the downsizing of the Alps.

University of Edinburgh, School of Geosciences seminar, March 2009: Was there a little ice age?

University of Washington, Seattle, WA, February, 2009: Dept. Atmospheric Sciences colloquium: What do glaciers tell us about climate variability and change?

California Institute of Technology, Pasadena, CA, Environmental Science and Engineering colloquium January, 09: The shape of things to come: what are the limits to global climate predictions?