

Curriculum Vitae

Jacob Ogilvie Sewall

Contact Information

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Education

- 1998-2004** Ph.D., Department of Earth Sciences, University of California, Santa Cruz.
Dissertation: Early Paleogene Climate: Causes and Consequences.
- 1994-1998** B.S. in Geology, Washington and Lee University, Lexington Virginia. Honors in Geology, *summa cum laude*.
Senior honors thesis: Tectonic controls on magma genesis in southern Oregon.
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Positions Held

- 2014 – Present** Associate Professor, Department of Physical Sciences, Kutztown University of Pennsylvania
- 2009 – 2014** Assistant Professor, Department of Physical Sciences, Kutztown University of Pennsylvania
- 2007 – 2009** Assistant Professor, Department of Geosciences, Virginia Polytechnic Institute and State University.
- 2006 – 2007** Postdoctoral Research Scientist, Institute for Marine and Atmospheric Research, Utrecht University, Utrecht, The Netherlands.
- 2004 – 2006** Postdoctoral Research Scientist, Department of Earth Sciences, University of California, Santa Cruz.

Awards and Grants Received

2017 – 2018	Field margins as historic baselines of biodiversity and ecosystem function in the fertile valleys of Pennsylvania: an experimental vehicle for restoration planning and academic program cohesion, \$5,000, PASSHE Faculty Professional Development Committee.
2014 – 2015	Assessing the Value of Conservation Lands in an Evolving Environment, \$15,000, VA Dept of Game & Inland Fisheries
2010 - 2012	Virginia Climate Change Modeling and Climate Change Vulnerability, \$74,455, VA Dept of Game & Inland Fisheries, National Wildlife Federation, U.S. Fish and Wildlife Service, Doris Duke Charitable Foundation.
2008	Reconstructing Eocene Arctic conditions during the Azolla event using proxy and model data, 50,000 CPU Hours, SystemX, Virginia Tech.
2008	Climate of southwestern North America during the Little Ice Age and the sensitivity of precipitation patterns to changes in Arctic sea ice, 75,000 CPU Hours, SystemX, Virginia Tech.
2005	Travel support for JOI/IODP Workshop: The Bering Strait, Rapid Climate Change, and Land Bridge Paleoecology
2003	Full support for the IARC Summer School on Modeling of Arctic Climate
1998-2002	National Defense Science and Engineering Fellow
1998	Honorable Mention National Science Foundation Pre-doctoral Fellowship
1998	Regents Fellowship, University of California, Santa Cruz
1998	Frank Young Geology Prize, Washington and Lee University
1996	Inducted Phi Beta Kappa
1995,1996,1997	Geology Department Honor Scholarship, Washington and Lee University

Journal Publications (* = KU Student Author)

Sewall, JO, Riihimaki, CA, and Kadegis, J*, 2015, Orbital control, climate seasonality, and landscape evolution in the Quaternary Rocky Mountains, *Geomorphology*, v. 250, p. 89 – 94, <http://dx.doi.org/10.1016/j.geomorph.2015.08.020>.

Sewall, JO and Fricke, HC, 2013, Andean-scale highlands in the Late Cretaceous Cordillera of the North American western margin, *Earth and Planetary Science Letters*, v.362, p. 88 – 98, <http://dx.doi.org/10.1016/j.epsl.2012.12.002>.

Clementz, MT and **Sewall, JO**, 2011, Latitudinal Gradients in Greenhouse Seawater $\delta^{18}\text{O}$: Evidence from Eocene Sirenian Tooth Enamel, *Science*, v. 332, p. 455 – 458, doi: 10.1126/science.1201182

Speelman, EN, **Sewall, JO**, Noone, D, Huber, M, von der Heydt, A, Sinninghe Damsté, JS, and Reichart, G-J, 2010, Modeling the influence of a reduced equator-to-pole sea surface temperature gradient on the distribution of water isotopes in the Eocene, *Earth and Planetary Science Letters*, v. 298, p. 57 – 65, doi:10.1016/j.epsl.2010.07.026

Haug, EW, Kraal, ER, **Sewall, JO**, Van Dijk, M, and Chong Dias, G, 2010, Climatic and geomorphic interactions on alluvial fans in the Atacama Desert, Chile, *Geomorphology*, v. 121, p. 184 – 196, doi: 10.1016/j.geomorph.2010.04.005

Fricke, HC, Foreman, BZ, and **Sewall, JO**, 2009, Integrated climate model-oxygen isotope evidence for a North America monsoon during the Late Cretaceous, *Earth and Planetary Science Letters*, v. 289, p. 11 - 21, doi:10.1016/j.epsl/2009.10.018

Sewall, JO, van de Wal, RSW, van der Zwan, K, van Oosterhout, C, Dijkstra, HA, and Scotese, CR, 2007, Climate Model Boundary Conditions for Four Cretaceous Time Slices, *Climate of the Past*, v.3, p. 647 – 657.

Sewall, JO and Sloan, LC, 2006, Come a little bit closer: A high-resolution climate study of the early Paleogene Laramide foreland. *Geology*, v. 34, p.81 - 84.

Sewall, JO, 2005, Precipitation shifts over western North America as a result of declining Arctic sea ice cover, the coupled system response, *Earth Interactions*, v. 9, p. 1 - 23.

Sewall, JO, Huber M, and Sloan LC, 2004, A method for using a fully coupled climate system model to generate detailed surface boundary conditions for paleoclimate modeling investigations: an early Paleogene example, *Global and Planetary Change*, v. 43, p. 173 - 182.

Sewall, JO and Sloan, LC, 2004, Less ice, Less tilt, Less chill: The influence of a seasonally ice-free Arctic Ocean and changing obliquity on early Paleogene climate, *Geology*, v. 32, p. 477-480.

Sewall, JO and Sloan, LC, Disappearing Arctic sea ice reduces available water in the American West, *Geophysical Research Letters*, v. 31, L06209, doi:10.1029/2003GL019133, 2004.

Lawrence, KT, Sloan, LC, and **Sewall, JO**, 2003, Terrestrial climatic response to precessional orbital forcing in the Eocene, in Wing, SL, Gingerich, PD, Schmitz, B, and Thomas, E, eds., Causes and Consequences of Globally Warm Climates in the Early Paleogene: Boulder, Colorado, Geological Society of America Special Paper 369, p. 65-77.

Sewall JO, Sloan LC, 2001, Equable Paleogene climates: The result of a stable, positive Arctic Oscillation? *Geophysical Research Letters*, v. 28, p. 3693-3695.

Sloan LC, Huber M, Crowley TJ, **Sewall JO**, Baum S, 2001, Effect of sea surface temperature configuration on model simulations of "equable" climate in the Early Eocene. *Palaeogeography Palaeoclimatology Palaeoecology*, v.167, p. 321-335.

Sewall, J O, Sloan, LC, Huber, M, and Wing, SL, 2000, Climate sensitivity to changes in land surface characteristics. *Global and Planetary Change*, v. 26, p. 445-465.

Book Chapters and Reports

Klopper, S., **Sewall, J.**, and Kramar, D., Species Adaptation to Forecasted Climate Changes in the Commonwealth of Virginia, Special report to the Virginia Department of Game and Inland Fisheries, December 2012, 20 pp.

Sewall, JO: Paleo-Climates, *in* The Encyclopedia of Global Warming and Climate Change, ed. S. George Philander, Sage Publications Inc, 1552p., 2008.

Sewall, JO: Cenozoic Era, *in* The Encyclopedia of Global Warming and Climate Change, ed. S. George Philander, Sage Publications Inc, 1552p., 2008.

Invited Presentations

Sewall, JO and Riihimaki, CA, Climate and Landscape Interactions in the North American Cordillera, Geological Society of America *Abstracts with Programs*. Vol. 48, No. 7

Sewall, JO and Fricke, HC, Insights into the Late Cretaceous through Early/Middle Eocene Evolution of the North American Cordillera from an Integrated Climate Modeling-Stable Isotope Study, American Geophysical Union Fall Meeting, December 16, 2014. San Francisco, CA.

Sewall, JO, Using Climate Simulation to Increase our Understanding of Landscape Evolution in the American West, The University of Texas at Arlington, April 17, 2014.

Sewall, JO and Fricke, HC, How High is High? Oxygen Isotopes, Climate Models, and the Sevier Highlands, The Pennsylvania State University, February 8, 2011.

Speelman, EN, **Sewall, JO**, Noone, D, Huber, M, Sinninghe Damsté, JS, and Reichart, G-J, Application of isotope modeling in sea surface salinity reconstruction of the Eocene Arctic Basin", SEM-symposium, Utrecht, The Netherlands, 2009.

Speelman, EN, Reichart, G-J, **Sewall, JO**, van Kempen, M, Brinkhuis, H, and Sinninghe Damsté, JS, De oceanen: een archief van sediment. Reconstructie van het klimaat tijdens het *Azolla* interval in het Eoceen, Pyrus symposium, Wageningen, The Netherlands, 2009.

Sewall, JO: The Climate Challenge: Setting the Context for Considering our Energy Future Options, Society of Environmental Journalists Annual Meeting, October 15, 2008.

Sewall, JO: Coal and Climate Change: How energy usage and sources influence global climate, *Summer around the Drillfield*, Virginia Tech, June 28, 2008.

Speelman, EN, Reichart, G-J, de Leeuw, J, Sinninghe Damsté, JS, **Sewall, JO**, Noone, D, con der Heydt, A, Brinkhuis, H, van Kempen, M, and Barke, J, The *Azolla* project: a combined biogeochemical and modeling approach", Virginia Polytechnic Institute and State University, Blacksburg, VA, U.S.A., 2008.

Sewall, JO: Understanding Global Climate One Region at a Time: RCM and GCM Investigations of Regional Climate, Virginia Polytechnic Institute and State University, April 11, 2006.

Sewall, JO: Understanding Global Climate One Region at a Time: RCM and GCM Investigations of Regional Climate, The University of Pennsylvania, March 24, 2006.

Sewall, JO: Understanding Global Climate One Region at a Time: RCM and GCM Investigations of Regional Climate, Texas A&M University, February 14, 2006.

Sewall, JO: Deep Time: From the Benthos to the Cosmos, Texas A&M University, February 13, 2006.

Sewall, JO: Climate impacts of changing ice cover: Arctic ice and American water, Los Alamos National Laboratory, September 14, 2005.

Sewall, JO: Climate impacts of changing ice cover: Arctic ice and American water, Utrecht University, Netherlands, June 29, 2005.

Sewall, JO: Zeroing in on early Paleogene climate, Utrecht University, Netherlands, June 30, 2005.

Sewall, JO: Early Paleogene climate: causes, consequences, and solutions, Northwestern University, February 25, 2005.

Sewall, JO: Changing Arctic ice cover and water resources in the American West, Northwestern University, February 24, 2005.

Sewall, JO and Sloan, LC, 2004, Changing Arctic ice cover and water resources in the American West, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., Abstract OS34A-06.

Sloan, LC, Snyder, M, Bell, J, Diffenbaugh, N., **Sewall, J**, Bryant, S, and Kueppers, L: Regional climate modeling at UCSC: Current work and new directions, 2nd Annual Regional Climate Modeling Workshop at ICTP, June 2004.

Sewall, JO, Sloan, LC: Melting Arctic Sea Ice Dries the American West, Lawrence Livermore National Lab, May 24, 2004.

Sewall, JO: Eocene Climate, What, How, and Why, Washington and Lee University, February 24, 2004.

Sewall, JO: Icy Hot: Warm, high-latitude Eocene Climate, Washington and Lee University, February 24, 2004.

Sewall, JO: SCD Facilities and Resource Use, SCD User Forum (SCD Advisory Panel, NCAR), April 24, 2003.

Pardee Keynote Symposium presentation, The causes and consequences of early Cenozoic warm climates, L. Cirbus Sloan, R. Peters, M. Huber, **J. Sewall**, and M. Snyder, Geological Society of America Ann. Meeting, Denver, CO, Abstracts with Programs – Geological Society of America, vol. 31, no. 7, pp. 120-121, 1999.

Contributed Presentations (* = KU Student Author)

*Sivak, T., *Reichard-Flynn, W.R., *Willever, H., Sewall, J.O., and Sherrod, L.A., Potential Palsa Relicts in Eastern Pennsylvania, Geological Society of America *Abstracts with Programs*. Vol. 50, No. 2 doi: 10.1130/abs/2018NE-311273

*Johnson, B.J., Sewall, J.O., and Sacchi, C.F., Reduction of Agricultural Surface Water Nitrogen Content Using Floating Algal Screens, 48th Annual Meeting, Commonwealth of Pennsylvania University Biologists, April 8, 2017, Kutztown, PA.

*Shaak, R., *Sutter, B., *Ofoma, O., and **Sewall, J.**, Sediment Storage on a 1st Order Stream Flood Plain Using GPR, Geological Society of America, *Abstracts with Programs*, v.49, n. 2, doi: 10.1130/abs/2017NE-290252

*McDermott, R.A., *Maguire, D., *Miller, K., and **Sewall, J.**, How Does Grain Size Vary on the Flood Plain? Geological Society of America, *Abstracts with Programs*, v.49, n. 2, doi: 10.1130/abs/2017NE-290777

Fricke, H., Ballesteros, M., Wilson, G.P., **Sewall, J.O.**, Sertich, J., and Fastovsky, D.E., Looking over the Late Cretaceous Cordillera: A Comparison of Stable Isotope Records and Climate Model Simulations from Utah and New Mexico with those from Baja California, Mexico, Geological Society of America *Abstracts with Programs*, v. 47, n. 7, p. 172.

*Sammel, R. and **Sewall, J.O.**, The Relative Influences of Water Source and Anthropogenic Impacts on Water Quality in the Moselem Creek, Berks County Pennsylvania, Geological Society of America *Abstracts with Programs*, v. 47, n. 7, p.729.

*Young, R.S., *Horner, A.L., *Dowdy, N.L., *Van Zee, A., *Musa, D., *Hillegas, L.M., *Burns, S., *Sherwood, W.C., *Rock, M.J., and **Sewall, J.O.**, Channel Morphology Controls on Sediment Transport in Jordan Creek, Schnecksville, Pennsylvania, U.S.A., Geological Society of America *Abstracts with Programs*, v. 46, n. 2, p.83.

*Dulak, A.M., and **Sewall, J.O.**, A Global Distribution of Late Eocene Vegetation, American Geophysical Union Fall Meeting, December 16, 2014. San Francisco, CA.

Sewall, J., Bringing Hands-On Geological Problem Solving into the Introductory-Level Lecture Hall, Paper No. 19-9, Geological Society of America Annual Meeting, Denver, CO, October 27-30, 2013, Geological Society of America *Abstracts with Programs*, v. 45, n. 7, p.68.

*Lembo, J. and Sewall, J., The Role of Metaphors in Public Comprehension and Retention of Science, Paper No. 160-6, Geological Society of America Annual Meeting, Charlotte, NC, November 4 – 7, 2012, Geological Society of America *Abstracts with Programs*, v. 44, n 7, p. 405.

Sewall, J. and Fricke, H., The Influence of Western Interior Seaway Isotopic Composition on Paleoelevation Estimates for Campanian Western North America, Paper No. 26-6, Geological Society of America Annual Meeting, Charlotte, NC, November 4 – 7, 2012, Geological Society of America *Abstracts with Programs*, v. 44, n 7, p. 83.

Clementz, M and **Sewall J**, Reduced meridional gradient in Eocene seawater temperature inferred from the stable isotope composition of fossil Sirenian tooth enamel, SVP Annual Meeting, Las Vegas, NV, U.S.A., 2011.

Riihimaki, CA, **Sewall, JO**, Kadegis, J*, and Reiners, PW, Modeling the connection between orbital parameters, precipitation, and landscape evolution in the Rocky Mountains, U.S.A., Abstract EP51C-07, AGU Fall Meeting, San Francisco, CA, U.S.A., 2011.

Sewall, JO, Longer and more frequent Mid-Atlantic heat waves by mid-century, Abstract GC21B-0880, AGU Fall Meeting, San Francisco, CA, U.S.A., 2011.

Kadegis, J*, **Sewall, JO**, and Riihimaki, CA, Orbital Eccentricity, Clinker Formation, and the Climate-Landscape Evolution Link in the North American Rockies and High Plains, GSA Fall Meeting, Minneapolis, MN, U.S.A., 2011.

Kraal, ER, Haug, E, Sewall, JO, Van Dijk, M, and Chong Diaz, G, Climatic and geomorphic interactions on alluvial fans in the Atacama Desert, Chile, Abstract EP23B-0783, AGU Fall Meeting, San Francisco, CA, U.S.A., 2010.

Fricke, H, and **Sewall, J**, Paleoelevation of the North American Cordillera from the Late Cretaceous to Late Eocene: An integrated climate model-oxygen isotope approach, GSA Annual Meeting, Denver, CO, U.S.A., 2010.

Speelman, EN, **Sewall, JO**, Noone, D, Huber, M, Sinninghe Damsté, JS, and Reichart, G-J, Modeling the influence of a reduced equator-to-pole sea surface temperature gradient on the distribution of water isotopes in the Eocene, AGU Fall Meeting, San Francisco, CA, U.S.A, 2009.

Speelman, EN, **Sewall, JO**, Noone, D, Huber, M, Sinninghe Damsté, JS, and Reichart, G-J, Application of innovative isotope modeling in sea surface salinity reconstruction of the Eocene Arctic Basin, NSG, Amsterdam, The Netherlands, 2009.

Speelman, EN, Reichart, G-J, **Sewall, JO**, van Kempen, M, Brinkhuis, H, and Sinninghe Damsté, JS, Eocene cooling through sustained growth of *Azolla?*", YES Congress, Beijing, China, 2009.

Speelman, EN, **Sewall, JO**, Noone, D, Reichart, G-J, Brinkhuis, H, de Leeuw, J, and Sinninghe Damsté, JS, Reconstruction of Eocene Arctic precipitation and stratification, IODP-day, Utrecht, The Netherlands, 2009.

Speelman, EN, **Sewall, JO**, Noone, D, Huber, M, Reichart, G-J, Brinkhuis, H, and Sinninghe Damsté, JS, Salinity reconstruction for the Eocene Arctic *Azolla* event using innovative isotope modeling, CBEP, Wellington, New Zealand, 2009.

Speelman, E., **J. O. Sewall**, D. Noone, M. Huber, J. S. S. Damsté, G.-J. Reichart. Application of isotope modeling in sea surface salinity reconstruction of the Eocene Arctic Basin. The Four Elements: A system earth modelling symposium. University of Utrecht, Netherlands. April 29, 2009.

Speelman, E.N., **J.O. Sewall**, D. Noone, M. Huber, J.S. Sinninghe Damste, and GJ Reichart: Sea surface salinity of the Eocene Arctic *Azolla* event using innovative isotope modeling. European Geophysical Union General Assembly 2009, Abstract EGU2009-1693, Vienna, April 2009.

Speelman, E., J. de Leeuw, G.-J. Reichart, **J. Sewall**, H. Brinkhuis, A. von der Heydt, D. Noone, J. S. Damste. Reconstructing surface water conditions during the Eocene Arctic *Azolla* event using proxy and model data. International Geological Congress. Oslo, Norway. 6-14 Aug. 2008.

Speelman, E. N., G-J. Reichart, J.M de Leeuw, **J. Sewall**, D. Noone, J.S. Sinninghe Damste, H. Brinkhuis, M. van Kempen: Reconstructing Eocene Arctic surface water conditions using proxy and model data. 9th Nederlands Aardwetenschappelijk Congres, Koningshof, Veldhoven, Nederlands, 2008.

Chassot, AM and **Sewall, JO**, The combined role of ENSO-driven sea surface temperature variation and Arctic sea ice extent in defining climate conditions in the southwestern United States, AGU Fall Meeting, 2008, C41B-0503.

Sewall, JO and Clementz, MT, A predictive model fore investigating seagrass paleoecology, biogeography and diversity, AGU Fall Meeting, 2008, PP13B-1439.

Speelman, EN, Reichart, G-J, Sinninghe Damsté, JS, **Sewall, JO**, and Noone, D, Reconstructing the Arctic Mid Eocene Environment – a biogeochemical perspective on the Eocene Azolla Bloom, IODP symposium, Bremen, The Netherlands, 2007.

Speelman, EN, Reichart, G-J, Sinninghe Damsté, JS, Brinkhuis, H, Barke, J, van Kempen, M, **Sewall, JO**, and von der Heydt, A, Reconstructing Sea Surface Salinity of the Eocene Arctic Basin, the International Meeting on Organic Geochemistry (IMOG) 2007.

Sewall, JO, Resolution dependence of winter Arctic sea ice decline in response to a quadrupling of CO₂, AGU Fall Meeting, 2006, C33B-1257.

Dijkstra, H and **Sewall, JO**, Climate model boundary conditions for four Cretaceous time slices, AGU Fall Meeting, 2006, PP23C-1769.

Sewall, JO, Lipscomb, W, and Tulaczyk, S, The influence of a more realistic representation of snow on sea ice: Results from a coupled, single column model, AGU Fall Meeting 2005, C33B-1124.

Sewall, JO and Sloan, LC, A detailed climate study of the early Paleogene Laramide foreland, GSA Annual meeting, October 16 – 19, 2005, paper # 186-1.

Sewall, JO, Climate impacts of changing ice cover: Arctic ice and American water. Polar Climate Working Group meeting, NCAR, March 29, 2005.

Sewall, JO and Sloan, LC, Disappearing Arctic Sea Ice Reduces Available Water in the American West, California Energy Commission Climate Change Conference, Sacramento, CA, June 9 – 11, 2004.

Sewall, JO and Sloan, LC, Melting Arctic Sea Ice Dries the American West, Eos Trans. AGU, 84(46), Fall Meet. Suppl., Abstract GC52A-03, 2003.

Sewall, JO and Sloan, LC, 2001, Arctic Influences: Causal Mechanisms and Climate Dynamics of the warm Early Paleogene, Eos, Trans. AGU, 82(47), Fall Meet. Suppl., Abstract PP42B-0520.

Lawrence, K.T., Sloan, L.C., and **Sewall, J.O.**, Eocene terrestrial climatic response to precessional orbital forcing: Implications for interpretation of the geologic record, Climate and Biota of the Early Paleogene International Meeting, Powell, WY, July 2001.

Lawrence, Kira T.; Sloan, L. Cirbus; **Sewall, Jacob O.**, American Geophysical Union, 2000 Fall Meeting, San Francisco, CA, United States. Terrestrial Climatic Response to Topographic and Orbital Forcing in the Eocene (OS11C-03). In: EOS, Transactions, American Geophysical Union, 2000 Fall Meeting, Vol. 81, No. 48, p. F703-F704

Sewall, Jacob Ogilvie; Sloan, Lisa Cirbus; Huber, Matthew, Sensitivity of Regional Climates to Land Surface Changes (OS21D-07). Eos, Trans., AGU, 80(46), Fall Meet. Suppl. Abstract OS21D-07, 1999.

Sloan, Lisa C.; Peters, Robert; Huber, Matthew; **Sewall, Jacob**; Snyder, Mark. Geological Society of America, 1999 annual meeting Denver, CO, United States Causes and consequences of early Cenozoic warmth. In: Geological Society of America, 1999 annual meeting. Boulder, CO: Geological Society of America (GSA), 1999 Abstracts with Programs - Geological Society of America Vol. 31, no.7 p. 120-121

Sewall, J.O., and Sloan, L.C., A comparison of CCM versus GENESIS climate modeling results for the early Eocene, Annual CSM meeting, Breckenridge, CO, June 1999.

Research Experience

2017 – Present: Field margins as historic baselines of biodiversity and ecosystem function in the fertile valleys of Pennsylvania: an experimental vehicle for restoration planning and academic program cohesion Working with other faculty in Environmental Science (Dr. Chris Habeck and Dr. Dan Aruscavage (Biology) and Dr. Julie Palkendo (Chemistry)) we are investigating the legacy of ecology and soil preserved in historical boundaries between agricultural fields. The information within these boundaries can provide an important baseline for assessing environmental degradation as well as providing a partial blueprint for restoration.

2011 – 2017: Climate and Landscape Evolution Links in the North American Rockies and High Plains Working with Dr. Catherine Riihimaki (Princeton University) and KU undergraduate Jeffrey Kadegis (graduated), I used an atmospheric general circulation model to investigate the potential that orbital climate forcing could drive variable precipitation along the Rocky Mountain Front and, thus, influence regional incision rates as evidenced by the incidence of coal fires/clinker production in the geological record.

2008 – 2017: Mesozoic through Cenozoic precipitation sources, atmospheric circulation, and paleoelevation in the American West

Based on data collected by Dr. Henry Fricke (Colorado College), I used a water-isotope-tracer version of the National Center for Atmospheric Research Community Atmosphere Model to investigate the interplay between precipitation source, water mass trajectory, and paleoelevation in determining observed patterns of lighter stable (water) isotopic signatures in the American West and, thence, unravel the evolution of the North American Cordillera.

2007 – 2016: Biogeography, diversity, and paleoecology of seagrass

In collaboration with Dr. Mark Clementz (University of Wyoming) I developed a predictive, parameter driven, numerical model of seagrass biogeography. This model is driven by a concise suite of paleoclimatic data or climate model output. The concise suite of driving parameters and the consequent flexibility of the model permit investigations into time specific seagrass biogeography and diversity throughout its evolutionary history as well as theoretical investigations of seagrass paleoecology and response to environmental changes. Both applications will contribute significantly to furthering our understanding of seagrasses, seagrass dominated ecosystems, and the roles they have played in the earth system over the past 70 Ma.

2013 – 2015: Assessing the Value of Conservation Lands in an Evolving Environment

Working with the Conservation Management Institute at Virginia Tech and the National Wildlife Federation, I developed a climate and conservation lands portfolio assessment product designed to project how conserved lands, habitats, and the needs of species may shift in the future. This product is intended to assist wildlife managers in planning and allocating limited resources as they adjust management strategies to consider the impacts of future climate change.

2011 – 2013: Increased Mid-Atlantic summer heat in the 21st century Working with KU undergraduate Kirsten Taylor (graduated), I used regional climate simulations of the highly populated Mid-Atlantic region to investigate the degree and duration of summer heat in the 21st century and, thus, inform planning and development efforts in adapting to longer, hotter summers.

2012: The role of metaphors in public comprehension and retention of science

Working with KU undergraduate Jessica Lembo, I investigated the role that language plays in encouraging public understanding and recall of printed scientific information. We found that for those readers with the lowest understanding and recall of information, carefully tailored metaphors in the text significantly increased their scientific literacy.

2009 – 2012: Virginia Climate Change Modeling and Climate Change Vulnerability

Working with the Conservation Management Institute at Virginia Tech and KU undergraduates Lyndsey Weaknecht, Ryan Schierer, Elizabeth Heness, and Kirsten Taylor, I used the ICTP regional climate model RegCM3 to generate high-resolution climate forecasts for the Commonwealth of Virginia to aid in updating the commonwealth's wildlife action plan and conservation efforts in the face of future climate change.

2007 – 2011: Stable isotopic signatures and salinity of the middle Eocene Arctic Ocean

With graduate student Eveline Speelman (Ph.D., Utrecht University, The Netherlands) I used a water-isotope-tracer version of the National Center for Atmospheric Research Community Atmosphere Model to simulate the isotopic signature of precipitation and runoff reaching the middle Eocene Arctic Ocean and the sensitivity of that signature to changes in Arctic sea surface temperatures and atmospheric pCO₂. Simulated isotopic signatures were combined (by Eveline Speelman) with biomarker and stable isotopic data (developed by Eveline Speelman) to place constraints on the salinity of the middle Eocene Arctic Ocean.

2007 – 2010: Mid-latitude climate impacts of changes in Arctic sea ice cover

With graduate student, Amanda Chassot (M.S. Virginia Tech, 2009), I continued to delve into the potential for changes in Arctic sea ice cover to have “far field” climate impacts by investigating the interplay between past changes in Arctic sea ice cover, tropical Pacific sea surface temperatures, and climate variability in the Holocene.

2006 – 2007: Cretaceous climate modeling and ocean anoxia

I conducted climate modeling of the Cretaceous as part of an interdisciplinary project designed to pinpoint areas of oil source rock formation. Working with a diverse group of Dutch researchers from Royal Dutch Shell and Utrecht University I developed boundary conditions and ran climate model simulations of four unique Cretaceous time slices (80 Ma, 90 Ma, 110 Ma, 150 Ma) in an effort to identify climate and oceanic conditions that might promote the formation of oil source rock. This climate model output will be combined with databases of sedimentary and geochemical data to develop an integrated model of source rock formation that will aid Royal Dutch Shell in oil exploration.

2005 – 2007: Ice modeling and ice/climate interactions

In collaboration with Dr. Slawek Tulaczyk (UCSC), Dr. William Lipscomb (LANL) and colleagues at the National Center for Atmospheric Research (NCAR) I developed a single column version of the Los Alamos sea ice model (CICE) coupled to the NCAR single column atmospheric model (SCAM) and slab ocean component.

2004-2005: Paleoclimate, Climate Modeling, Global Climate Change

I continued to work with Dr. Lisa Cirbus Sloan (UCSC) and used a regional climate model to investigate Eocene climate of the Cordillera and global climate models to explore the potential climate impacts of alternative energy sources (e.g. solar power). In addition, I worked with climate model output for the IPCC 4th Assessment to investigate the climate impacts of future reductions in Arctic ice cover.

2000-2004: Paleoclimate, Climate Modeling, Global Climate Change

I worked with Dr. Lisa Cirbus Sloan to investigate the influence of Arctic climate and surface conditions on extrapolar latitudes. My work focused on the interplay between sea ice and Northern hemisphere warm climates. For this research I spent a summer on Axel Heiberg Island generating detailed stratigraphy for Eocene sediments, I developed a new climate modeling method and completed several experiments with the National Center for Atmospheric Research's fully coupled CCSM. I also used the regional climate model RegCM2 to investigate early Eocene climate dynamics of western North America and presented and investigated the hypothesis that reduced planetary obliquity was responsible for producing equable Paleogene climates. With Dr. Sloan as the P.I., I coauthored an NSF grant providing \$247,295 of support for this research.

1998-2000: Paleoclimate, Climate Modeling, Global Climate Change

I worked with Dr. Lisa Cirbus Sloan and her research group to investigate the impacts of land surface changes on early Eocene (~50 Ma) warm climates. I created global Eocene topography at 2°x2° spatial resolution and tested climate sensitivity to this improved topography as well as to a more realistic surface vegetation distribution. In this research I used the GENESIS v.2 climate model.

Professional Memberships

1998-Present: Member American Geophysical Union

2010 –Present: Member Geological Society of America

2012 –Present: Member National Association of Geoscience Teachers

Professional Workshops

- 2015** Engaging Students and Faculty in Assessment at Drexel University's Second Annual Conference on Assessment, Teaching & Learning, September 9 – 11, 2015.
- 2014** Kutztown University Workshop on General Education and Assessment: Finding Common Ground with General Education at KU
- 2013** Geological Society of America Webinar: Emerging Workforce Trend in the U.S. Energy and Mining Industries: A Call to Action (National Research Council, 2013).
- 2013** Effective Strategies for Undergraduate Geoscience Teaching Virtual Event Series: Teaching and assessing in-depth understanding of fundamental concepts using concept sketches.
- 2013** American Geological Institute Webinar: National Geoscience Student Exit Survey – Spring 2012 Results.
- 2013** Kutztown University Workshop on General Education and Assessment: The Curriculum – Co-Curriculum Connection
- 2011** Kutztown University Center for the Enhancement of Teaching: Kutztown University's General Education Curriculum: What do we know? Where do we go?
- 2010** Kutztown University Center for the Enhancement of Teaching: Exit Survey, What do your seniors think?

- 2009 Kutztown University Center for the Enhancement of Teaching: New Faculty Orientation.
- 2009 On the Cutting Edge. Early Career Geoscience Faculty: Teaching, Research, and Managing Your Career.
- 2008 Virginia Tech Center for Excellence in Undergraduate Teaching: Creating Engaging Learning Environments in Large Classroom Spaces (SCALE-UP).
- 2008 Virginia Tech Faculty Development Institute: Thinking About Teaching/ The First Year Cohort.
- 2008 Virginia Tech Faculty Development Institute: Re-thinking the Ways We Engage 21st Century Learners: Teaching Strategies for all Disciplines.
- 2003 JOI/IODP Workshop: The Bering Strait, Rapid Climate Change, and Land Bridge Paleocology.
- 2003 Council on Undergraduate Research – Geosciences Division: How to get a research program started at a primarily undergraduate institution.
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Research Students

- Ben Johnson (Environmental Science: Biology major): Studied the potential for enhanced algal growth to remove agricultural nutrient loads from first order streams.
- Richard Sammel (Geology major): Studying the influence of source water, bedrock geology, and anthropogenic disturbance on water quality in the Moselem Creek.
- Angelica Dulak (Geology major): Working on the development of late Eocene surface boundary conditions for inclusion in the **Mesozoic through Cenozoic precipitation sources, atmospheric circulation, and paleoelevation in the American West** project (2014).
- Mark Sweitzer (Environmental Science: Biology major): Worked on the **Assessing the Value of Conservation Lands in an Evolving Environment** project (2014).
- Kirsten Taylor (B.S. Kutztown University, 2013): Worked on the **Virginia Climate Change Modeling and Climate Change Vulnerability** project (2011) and the **Increased Mid-Atlantic summer heat in the 21st century** project (2012 – 2013).
- Jessica Lembo (B.A. Kutztown University, 2012): Investigated **The role of metaphors in public comprehension and retention of science** (2012).
- Jeffrey Kadegis (B.S. Kutztown University, 2012): Worked on the **Climate and Landscape Evolution Links in the North American Rockies and High Plains** project (2011).
- Elizabeth Heness (B.S. Kutztown University, 2013): Worked on the **Virginia Climate Change Modeling and Climate Change Vulnerability** project (2011).
- Eveline Speelman (Collaborating Advisor, Ph.D. Utrecht University, The Netherlands, 2011): Worked on the **Stable isotopic signatures and salinity of the middle Eocene Arctic Ocean** project (2007 – 2011).
- Lyndsey Weaknecht (B.S. Kutztown University, 2011): Worked on the **Virginia Climate Change Modeling and Climate Change Vulnerability** project (2010).
- Ryan Scheirer (B.S. Kutztown University, 2011): Worked on the **Virginia Climate Change Modeling and Climate Change Vulnerability** project (2010).
- Amanda Chassot (M.S. Virginia Tech, 2009): Investigated the interplay between past changes in Arctic sea ice cover, tropical Pacific sea surface temperatures, and climate variability in the Holocene.
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Courses Taught

Sedimentology and Stratigraphy (Fall 2011 - 2017)
Introduction to Physical Geology (Spring 2011, 2018)
Historical Geology (Spring 2010 - 2016)
Senior Seminar (Spring 2010)
Environmental Geology (Fall 2009 - 2017 Spring 2010 – 2016, 2018)
Introduction to Environmental Science (Team Taught, Fall 2009 - 2017 Spring 2012 – 2016, 2018)
Introduction to Geology Laboratory (Fall 2009, 2010 Spring 2011)
Introduction to Meteorology (Fall 2007, 2008)
The Environmental Impacts of Energy (Fall, 2008)

University Service

2010 – present Advisor, Environmental Action Club
2010 – present Geology Program Assessment Committee Member
2010 – present Environmental Science Program Committee Member
2017 Acting Environmental Science Program Coordinator
2015 – 2017 Environmental Science Program Coordinator
2016 - 2018 Member, Working Group I, Middle States Self Study
2014 – 2016 Chair, College of Liberal Arts and Sciences Assessment Committee
2010 – 2014 Secretary, College of Liberal Arts and Sciences Assessment Committee

Professional Service

2015 – present Coordinator, Kutztown Elementary School Garden
2012 – 2018 Member-at-Large, Geological Society of America, Committee on Research Grants
2012 Workshop Leader, On the Cutting Edge: Preparing for an Academic Career in Geosciences
Grant Review: The National Science Foundation
The U.S. Civilian Research and Development Foundation
Manuscript Review: *Nature Geoscience*
Geology
Climate of the Past
Earth and Planetary Science Letters