VITA

BENJAMIN S. FELZER

BIOGRAPHICAL INFORMATION

Work: Department of Earth and Environmental Sciences, Lehigh University, 1 W. Packer Dr., Bethlehem, PA 18015-3188
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Educational History

Doctor of Philosophy in Geological Sciences, May, 1995 from Brown University, Dr. Thompson Webb III, advisor. Thesis title: Sensitivity of late Quaternary Climates to Changes in Northern Hemisphere Ice Sheets: Experiments with a General Circulation Model.

Masters of Science in Geology, December 1991 from University of Colorado – Boulder, Dr. Alexander F. H. Goetz, advisor. Thesis title: Quantitative reflectance spectroscopy of buddingtonite from the Cuprite mining district, Nevada.

Bachelor of Arts in Physics, May 1987 from Swarthmore College, minor in Astronomy, graduated with Honors.

Employment History

Associate Professor, June 2014 – present, Department of Earth and Environmental Sciences, Lehigh University, Bethlehem, PA.

Assistant Professor, 8/2008 – 6/2014, Department of Earth and Environmental Sciences, Lehigh University, Bethlehem, PA.

Research Associate, 8/2001 – 8/2008, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA.

Visiting Professor, 1/2008-6/2008, Department of Geology, Oberlin College, Oberlin, OH.

Adjunct Faculty, Fall Semester, 2007, Bristol Community College, New Bedford, MA.

Program Specialist, 7/2000 - 7/2001, Office of Global Programs, National Oceanic and Atmospheric Administration, Global Energy and Water Cycle Experiment - Americas Prediction Project (GAPP-GEWEX), Silver Spring, MD.

Project Scientist - Climate Scenarios Coordinator, 9/1998 - 7/2000, National Assessment Working Group and the National Assessment Coordination Office, National Center for Atmospheric Research, Boulder, CO.

PALE Postdoctoral Fellow - Paleoclimates, 10/1995 - 9/1998, National Center for Atmospheric Research, Boulder, CO, Dr. Starley Thompson, research collaborator.

Graduate Research Assistant, 1991 – 1995, Department of Geological Sciences, Brown University, Providence, RI.

Graduate Research Assistant, 1989 – 1990. Geological Sciences Department, University of Colorado – Boulder, Boulder, CO.

PUBLICATIONS

Book Chapters

National Assessment Synthesis Team. **2000**. Climate change impacts on the United States: the potential consequences of climate variability and change, prepared as part of the USGCRP for the NSTC and the U.S. Congress, Overview and Climate Foundation chapter.

Reilly, J., Felzer, B., Kicklighter, D., Melillo, J., and Tian, H. **2007**. The prospects for biological carbon sinks in greenhouse gas emissions trading systems., in Greenhouse Gas Sinks, Ed. Reay, D., Hewitt, N, Smith, K., and Grace, J. CABI Publishing, Cambridge, MA. 290 pp.

Prinn, R., J. Reilly, M. Sarofim, C. Wang, and B. Felzer. **2007**. Effects of air pollution control on climate: results from an integrated assessment model, Chapter 8 in: M.E. Schlesinger, H.S. Kheshgi, J. Smith, F.C. de la Chesnaye, J.M. Reilly, T. Wilson, and C. Kolstad (eds.), Human-Induced Climate Change: An Interdisciplinary Assessment, Cambridge University Press, Cambridge: 93-102.

Refereed Journals

Felzer, B., P. Hauff and A. F. H. Goetz. **1994.** Quantitative reflectance spectroscopy of buddingtonite from the Cuprite mining district, Nevada. Journal of Geophysical Research. 99(B2): 2887-2895.

Felzer, B., R. J. Oglesby, H. Shao, T. Webb III, D. Hyman, W. L. Prell and J. E. Kutzbach. **1995**. A systematic study of GCM sensitivity to latitudinal changes in solar radiation. Journal of Climate. 8: 877-887.

Felzer, B., R.J. Oglesby, T. Webb III, and D. Hyman. **1996**. Sensitivity of a general circulation model to changes in northern hemisphere ice sheets. Journal of Geophysical Research. 101(D14): 19077-19092.

Felzer, B.,T. Webb III, and R.J. Oglesby. **1998**. The impact of ice sheets, CO_2, and orbital insolation on late Quaternary climates: Sensitivity experiments with a general circulation model. Quaternary Science Reviews. 17: 507-534.

Pollard, D., Bergengren, J. C., Stillwell-Soller, L. M., Felzer, B., and S. L. Thompson. **1998**. Climate simulations for 10000 and 6000 years BP using the GENESIS global climate model. Paleoclimates: Data and Modelling. 2(2-3): 183-218.

Felzer, B., T. Webb III, and R. J. Oglesby. **1999**. Climate model sensitivity to changes in boundary conditions during the Last Glacial Maximum. Paleoclimates: Data and Modeling. 5: 257-278.

Felzer, B. and P. S. Heard. **1999**. Precipitation differences amongst GCMs used for the U.S. National Assessment. Journal of the American Water Resources Association. 35(6): 1327-1339.

Felzer, B., Thompson, S. L., Pollard, D., and J. C. Bergengren. **2000**. GCM-simulated hydrology in the Arctic during the past 21,000 years. Journal of Paleolimnology. 24: 15-28.

MacDonald, G. M., Felzer, B., Finney, B. P., and S. L. Forman. **2000**. Holocene lake sediment records of Arctic hydrology. Journal of Paleolimnology. 24: 1-14.

Felzer, B. **2001**. Climate impacts of an ice sheet in East Siberia during the Last Glacial Maximum. Quaternary Science Reviews. 20: 437-447.

Felzer, B. and S. L. Thompson. **2001**. Evaluation of a regional climate model for paleoclimate applications in the Arctic. Journal of Geophysical Research. 106(D21): 27407-27424.

MacCracken, M. C., Barron, E. J., Easterling, D. R., Felzer, B. S., and Karl, T. R. **2003**. Climate change scenarios for the U.S. National Assessment. Bulletin of the American Meteorological Society, DOI: 10.1175/BAMS-84-12-1711.

Endreny, T., Felzer, B., Shuttleworth, J. W., and Bonell, M. **2003**. Policy to coordinate watershed hydrological, social, and ecological needs: the HELP initiative. Water Resources Monograph 16, 10.1029/016WM22.

Felzer, B., Kicklighter, D., Melillo, J., Wang, C., Zhuang, Q., and R. Prinn. **2004**. Effects of ozone on net primary production and carbon sequestration in the conterminous United States using a biogeochemistry model. Tellus. 56B: 230-248.

Zhuang Q, Melillo J.M., Kicklighter D.W., Prinn R.G., McGuire A.D., Steudler P.A., Felzer B.S., Hu S. **2004.** Methane Fluxes Between Terrestrial Ecosystems and the Atmosphere at Northern High Latitudes During the Past Century: A Retrospective Analysis with a Process-based Biogeochemistry Model. Global Biogeochemical Cycles. 18, GB3010, doi:10.1029/2004GB002239.

Felzer, B. S., Reilly, J. Melillo, J., Kicklighter, D. W., Sarofim, M., Wang, C., Prinn, R. G., and Q. Zhuang. **2005**. Future effects of ozone on carbon sequestration and climate change policy using a global biochemistry model. Climatic Change. 73 (3): 345-373.

Miller, G. H., Mangan, J., Pollard, D., Thompson, S. L., Felzer, B. S., and Magee, J. W. **2005**. Sensitivity of the Australian monsoon to insolation and vegetation: implications for human impact on continental moisture balance. Geology. 33(1): 65-68.

Zhuang, Q., Melillo, J. M, Sarofim, M. C., Kicklighter, D. W., McGuire, A. D., Felzer, B. S., Sokolov, A., Prinn, R. G., Steudler, P. A., and Hu S. **2006**. CO_2 and CH_4 exchanges between land ecosystems and the atmosphere in northern high latitudes over the 21st century. Geophysical Research Letters .33, L17403, doi: 10.1029/2006GL026972.

Zhuang, Q., Melillo, J. M. , McGuire, A. D., Kicklighter, D. W., Prinn, R. G., Steudler, P. A., Felzer B. S., and Hu S. **2007**. Net emissions of CH_4 and CO_2 in Alaska: implications for the region's greenhouse gas budget. Ecological Applications. 17(1), 203-212. [83, 5.102]

Reilly, J., Paltsev, S., Felzer, B., Wang, X., Kicklighter, D. Melillo, J., Prinn, R., Sarofim, M., Sokolov, A., and Wang, C. **2007**. Global economic effects of changes in crops, pasture, and forests due to changing climate, carbon dioxide, and ozone. Energy Policy, 35: 5370-5383.

Ren, W., Tian, H., Liu, M., Zhang, C., Chen, G., Pan, S., Felzer, B., Xu, X. **2007**. Effects of tropospheric ozone pollution on net primary productivity and carbon storage in terrestrial ecosystems of China. Journ. Geophys. Res. 112, D22S09, doi:10.1029/2007JD008521.

Felzer, B. S., Cronin, T., Reilly, J. M., Melillo, J. M. and Wang, X. **2007**. Impacts of ozone on trees and crops. Comptes rendus Geosience. 339/11-12: 784-798 DOI: 10.1016/j.crte.2007.08.008.

Sokolov, A. P., Kicklighter, D. W., Melillo, J. M., Felzer, B. S., Schlosser, C. A., and Cronin, T. W. **2008.** Consequences of considering carbon-nitrogen interactions on the feedbacks between climate and the terrestrial carbon cycle. Journal of Climate. 21: 3776-3796.

Published while at Lehigh

Felzer, B. S., Cronin, T. W., Melillo, J. M., Kicklighter, D. W., Schlosser, C. A. **2009**. Importance of carbon-nitrogen interactions and ozone on ecosystem hydrology during the 21st century. JGR – Biogeosciences. 114, doi:10.1029/2008JG000826.

Sokolov, A., Stone, P. H., Forest, C. E., Prinn, R., Sarofim, M. C., Webster, M., Paltsev, S., Schlosser, C. A., Kicklighter, D., Dutkiewicz, S., Reilly, J., Wang, C., Felzer, B., Melillo, J. M. and Jacoby. **2009**. H.D. Probabilistic forecast for twenty-first-century climate based on uncertainties in emissions (without policy) and climate parameters. Journal of Climate. 22:5175-5204.

Melillo, J. M., Reilly, J. M, Kicklighter, D. W., Gurgel, A. C., Cronin, T. W., Paltsev, S., Felzer, B. S., Wang, X., Sokolov, A. P., and Schlosser, C. A. **2009**. Indirect emissions from biofuels: how important? Science. 326:1397-1399.

Felzer, B. S., T. W. Cronin, J. M. Melillo, D. W. Kicklighter, C. A. Schlosser, and S. R. S. Dangal. **2011**. Nitrogen effect on carbon-water coupling in forests, grasslands, and shrublands in the arid Western U.S. JGR – Biogeosciences. 116. G03023. doi:10.1029/2010JG001621.

Lee, E., Barford, C. L., Kucharik, C. J., Felzer, B. S., Foley, J. A. **2011**. Role of turbulent heat fluxes over land in the monsoon over East Asia. International Journal of Geosciences, 2: 420-431.

Felzer, B. **2012**. Carbon, Nitrogen, and Water Response to Climate and Land Use Changes in Pennsylvania during the 20th and 21st Centuries, Ecological Modelling, 240: 49-63.

Lee, E. and Felzer, B. S., and Kothavala, Z. **2013**. Effects of Nitrogen Limitation on Hydrological Processes in CLM4-CN. Journal of Advances in Modeling Earth Systems. 5(4): 741-754. doi:10.1002/jame.20046.

Ruegg, J., Gries, C., Bond-Lamberty, B., Bowen, G.J., Felzer, B.S., McIntyre, N.E., Soranno, P.A., Vanderbilt, K.L., and Weathers, K.C. **2014.** Completing the data life cycle: Using information management in macrosystems ecology research. Frontiers in Ecology and the Environment. 12(1): 24-30.

Dangal, S.R.S., Felzer, B.S., and Hurteau, M.D. **2014.** Effects of agriculture and timber harvest on carbon sequestration in the eastern US forests. JGR-Biogeosciences. doi:10.1002/2013JG002409. 119(1): 35-54.

He,Y., Jones, M., Zhuang, Q., Bochicchio, C., Felzer, B.S., Mason, E. and Yu, Z. **2014.** Evaluating the effects of climate seasonality on CO_2 and CH_4 cycling of Alaskan Ecosystems during the Holocene Thermal Maximum. Quaternary Science Reviews. 86: 63-77.

Felzer, B. and Sahagian, D. **2014.** Climate impacts on regional ecosystem services in the United States from CMIP3-based multimodel comparisons. Climate Research. doi0.3354/cr01249.

Jiang, M., Felzer, B., Hargreaves, B., and Zhang, J. **2014.** Improved understanding of climate change impact to Pennsylvania dairy pasture. Crop Science. doi10.2135/cropsci2014.05.0377.

Andrews, T.A. and **Felzer, B.S. 2015.** Very-heavy precipitation in the greater New York City region and widespread drought alleviation tied to western US agriculture. PLOS ONE10(12): doi10.1371/journal.pone.0144416.

Tian, H., Ren, W., Tao, B., Sun, G., Chappelka, A., Wang, X., Pan, S. Yang, J., Liu, J., **Felzer, B.**, Melillo, J., and Reilly, J. **2016.** Climate extremes and ozone pollution: a growing threat to China's food security. Ecosystem Health and Sustainability. doi:10.1002/ehs2.1203/.

Zhang, J. **Felzer, B.S.**, Troy, T. J. **2016.** Extreme precipitation drives groundwater recharge: the Northern High Plains Aquifer, Central United States, 1950-2010. Hydrological Processes, doi:10/1002/hyp.10809.

Jiang, M., **Felzer, B.S**., and Sahagian, D. **2016.** Characterizing predictability of precipitation means and extremes over the conterminous United States, 1949-2010. J. Climate, *http://dx.doi.org/10.1175/JCLI-D-15-0560.1*.

Jiang, M., **Felzer, B.S**., and Sahagian, D. **2016.** Predictability of precipitation over the conterminous U.S. based on the CMIP5 multi-model ensemble. Sci. Rep., doi:10.1038/srep29962.

Jiang, M., **Felzer, B.S.**, Nielsen, U. and Medlyn, B. **2017**. Biome-specific climatic space defined by temperature and precipitation predictability. Global Ecology and Biogeography. DOI:10.1111/geb12635.

Felzer, B.S. and Jiang, M. **2018.** Effect of Land Use and Land Cover Change in Context of Growth Enhancements in the U.S. since 1700: Net Source or Sink?. JGR-Biogeosciences. 123: 3439-3457. https://doi.org/10.1029/2017JG004378.

Felzer, B.S. 2019. Clean Air Is a Win-Win. Nature Climate Change. 10: 101-105. https://doi.org/10.1038/s41558-019-0685-4.

Felzer, B.S., Ember, C.R., Chiang, R., and Jiang, M. **2020**. The relationships of extreme precipitation and temperature events with ethnographic reports of droughts and floods in nonindustrial societies. Weather, Climate, and Society, 12: 135-148, DOI: 10.1175/WCAS-D-19-0045.1.

Zhang, J. **Felzer, B.S.**, and Troy, T.J. **2020.** Projected changes of carbon balance in mesic grassland ecosystems in response to warming and elevated CO_2 using CMIP5 GCM results in the Central Great Plains, USA. Ecological Modeling. 434: 109247.

Ember, C.R., Skoggard, I., **Felzer, B.**, Pitek, E., and Jiang, M. **2021.** Climate variability, drought, and the belief that high gods are associated with weather in nonindustrial societies. Weather, Climate, and Society. DOI: 10.1175/WCAS-D-20-0080.1.

H-index:
26 (google scholar, discounting grey literature)

Press Releases

- NASA press release, 7/6/09, Ozone, Nitrogen Change the Way Rising CO_2 Affects Earth's Water. (http://www.nasa.gov/topics/earth/features/nitrogen_ozonestress.html)
- Lehigh press release, 11/22/10, The Causes, Effects, and Feedbacks of Global Climate Change.
- Allentown Morning Call, Sahagian and Felzer, 08/10/11, Reducing greenhouse gases now can curtail global warming.
- Allentown Morning Call, Planning a green future by M. Bilinski and S. Sigafoos. 5/29/2021.

FUNDED RESEARCH

Competitively-Awarded Research Grants while at Lehigh

- Climate change and Pennsylvania land use research project, Felzer, B., Holland, B., Pazzaglia, F., and Sahagian, D. (collaborators), seed-grant to Westwind Foundation, $9960 (towards hiring undergraduate student for summer and fall, 2010).
- Collaborative Research: Impacts of Climate Sensitivity on Carbon Accumulation and Methane Emissions of Alaskan Ecosystems during the Holocene Thermal Maximum, Z. Yu (PI), B. Felzer and M. Jones (co PIs), NSF – Ecosystem Science, 08/01/09-07/31/12, $399,468.
- Effect of the Terrestrial Ecosystem on Freshwater Input to the Arctic and the 'Global Conveyor Belt', B.S. Felzer, Lehigh University, 07/01/09-07/01/10, FRG. $2500.
- Effect of Warming, Moisture Changes, and Elevated CO_2 on Carbon and Water Feedbacks in the Coupled Earth System. B.S. Felzer. Class of 68 Fellowship 2010, $2031..

- Impacts of climate change on biofuels production, J. Melillo (PI), D. Kicklighter, B. Felzer (*co-Is), DOE – Basic Research and Modeling to Support Integrated Assessment, 10/01/08 – 09/30/11, $85,000 subcontracted to Lehigh.
- Type 2: The Future of Ecosystems and Extremes: Using Diverse Environmental Data Sets in Support of Regional to Global Earth-System Models and Predictions, NSF Macrosystems Biology (NSF 10-555), Subaward from MIT, 2/1/2012-1/31/2017, $840,751 to Lehigh over 5 years.
- Measuring carbon and nitrogen stocks and fluxes from Pennsylvania dairy farms and suburban turflawns, Felzer, B. S. Lehigh University FRG, 5/1/2012-4/30/2013, $806.
- An Integrated Framework for Climate Change Assessment: Coupled climate-vegetation feedback and extreme events, 300,000 core-hours awarded on NSF Yellowstone supercluster at Computational and Information Systems Laboratory (CISL), 10/18/2012.
- XSEDE startup computer time awared on NSF superclusters Ranger (Texas Advanced Computing Center) and Kracken (National Institute for Computational Sciences, Oak Ridge National Laboratory).
- Assessing stakeholder-defined land use scenarios and the associated ecosystem service changes in the Columbia River Basin of the Pacific Northwest under climate change. Felzer, B.S. Lehigh University. Class of 68 Fellowship 2014. $2000.
- NSF IBSS (Interdisciplinary Behavioral and Social Science): Climate-Related Hazards, Disasters and Cultural Transformations. C. Ember (PI), B. Felzer, M. Gelfand, E. Jones, and P. Peregrine (CoIs). 12/2/13 submitted. $163,894 to Lehigh over 4 years.
- Faculty Innovation Grant (FIG). Effect of Insects on the Terrestrial Carbon Sink under 21st Century Warming. $28159, 4/4/2019-4/4/2020.

Competitively-Awarded Research Grants prior to Lehigh (no funding continued at Lehigh)

- Nonlinear and threshold responses to environmental stresses in land-river networks at regional to continental scales, J. Melillo, B. Peterson, and C. Vorosmarty (co-PIs), B. Felzer, D. Kicklighter, J. McClelland, and W. Wollheim (*co-Is), EPA/DOE – Nonlinear Responses to Global Change in Linked Aquatic and Terrestrial Ecosystems and Effects of Multiple Factors on Terrestrial Ecosystems, 06/01/06-05/31/09, $899,191, 2 month's salary per year.
- Dynamic Modeling of Emissions from Land-Use Activities, EPA - Dynamic Global Economic Modeling of Greenhouse Gas Emissions and Mitigation from Land-Use Activities, (XA-83240101); J. Reilly and J. Melillo (co-PIs), B. Felzer, D. Kicklighter, and S. Paltsev (*co-Is), 06/14/05-06/13/10, $500,000, 1.5 month's salary per year.
- Testing trace gas flux models using in-situ and remotely-sensed data, NASA Interdisciplinary Science Program, (NNG04GJ80G, NNG04GM39G); R. Prinn, and J. Melillo (co- PIs), Reilly, J. M, Eckaus, R. S., Jacoby, H. D., Paltsev, S., Felzer, B., Kicklighter, D. W., DeFries, R., Forest, C., Huang, J., and Wang, C. (*co-Is), 05/01/04-04/30/07, $441,310, 1 month's salary per year.
- Global effects of human and terrestrial ecosystems, J. Reilly and J. Melillo (co-PIs), R. Prinn, R. Eckaus, H. Tian, B. Felzer, and D. Kicklighter (*co-Is), NSF-Biocomplexity, 09/14/04-02/28/09, $200,000, (none allocated towards my salary).

* co-I: Since I was a research associate and not a PI at MBL, I was not permitted to be a PI on a proposal, but rather a co-investigator. These proposals were all written as large collaborative efforts for which each of the investigators, principle and otherwise, had a role in writing the proposal and conducting the research.

Other Research Grants while at Lehigh

- Coupled Climate-Carbon Feedbacks of Future Land Use Change Using TEM and CLM-CN, Felzer, B. MIT-Joint Program on the Science and Policy of Global Change subcontract. $141,913, 6/15/2010 (towards hiring 2-year postdoctoral fellow with matching Lehigh funds)
- An Integrated Framework for Climate Change Assessment, DOE subaward from MIT-Joint Program on the Science and Policy of Global Change subcontract. 6/15/2012-12/14/2013, $64,154 (towards continued funding of postdoctoral fellow).

Total funding to Lehigh through independent/collaborative grants: $1,756,478
Total funding to Felzer research group at Lehigh through independent/collaborative grants: $1,141,374

SCHOLARLY PRESENTATIONS

Invited Presentations (since joining Lehigh)

- Spoke after showing of "Six Degrees" sponsored by College Democrats at Lehigh University, 3/16/09.
- Spoke as part of Maasai panel event entitled "Global Climate Change: Is There Hope for Kenya's Maasai?) about meteorology and climate in East Africa, 4/15/09.
- Led Paleodiscussion at Paleo-lunch group meetings each semester.
- Franklin and Marshall College, Department of Earth and Environment, 2009
- MOPTA (Modeling and Optimization: Theory and Applications), 08/19/09-08/21/09, Lehigh University (also chair of Simulation and Modeling Session)
- Lehigh Mathematics Department seminar series, Using a Biogeochemical Model to Explore the Effects of Carbon-Water Linkages on U.S. Vegetation and Runoff, 9/22/10.
- Swarthmore College, Department of Biology, Ecology class, Using a Biogeochemical Model to Explore Future Vegetation Productivity and Runoff in the Western U.S. + career discussion, 1/26/11.
- Higher Education Collaborations for Research and Technology at Lehigh University via PennREN, video presentation, 4/19/2012.
- Climate Change Summit, Haverford College, panelist, 3/23/2013.

- 2013 Terrestrial Ecosystem Model Research and Development Workshop, Talk title: TEM carbon-nitrogen-water dynamics, ozone, natural and human disturbance, extremes and daily TEM, 6/17/13-6/19/13.
- EES Seminar Series, "How Environmental Stresses Affect Ecosystem Services in the U.S." 9/27/2013.
- West Virginia University, Division of Forestry and Natural Resources Seminar, Effect of Climate Change, Land Use Change, elevated CO_2, and Air Pollution on Ecosystem Services in the U.S. Mid-Atlantic Region, 4/2/2014.
- Penn State, Department of Ecosystem Science and Management Seminar. Regional Consequences of Climate and Land Use Change on Ecosystem Services in Pennsylvania. 4/11/14.
- MIT, Joint Program on the Science and Policy of Global Change, Effect of disturbance on carbon dynamics in the U.S., Joint Program Lunch Talk, 11/7/14.
- Spoke about climate change at Trinity Evangelical Lutheran Church, "What's up with the weather", sponsored by Green Faith and Climate Voices, 4/26/2015
- NSF Headquarters. 2015. The Future of Ecosystems and Extremes: Using Diverse Environmental Data Sets in Support of Local to Regional to Earth-System Models and Predictions. NSF Macrosystems Biology P.I. Meeting. Ballston, VA. 8/6/2015.
- Lehigh Valley Watershed Conference, Regional climate change and hydrology, invited talk, Bethlehem, PA, 10/13/15.
- Penn State Meteorology Department, How human and natural disturbance affects the U.S. carbon sink, invited talk, State College, PA, 10/12/2015.
- Monocacy Creek Watershed Association. 2016. Modeling flooding of the Monocacy. June 21, 2016.
- ESA 2016 Annual Meeting, Session "Agroecosystem responses to multiple global change drivers in the atmosphere", Talk title "Does a large carbon sink imply a healthy forest?", 8/9/2016, Fort Lauderdale, FL. (invited talk).
- AAAS annual meeting, Helped organize session, "Patterns of Resilience to Climate-Related Disasters", talk: (B. Felzer and C. Ember) Climate extremes, perceived disasters, and cultural transformations. 2/17/2017, Boston, MA.
- Pennsylvania Earth Science Teachers Association, "Overview of climate science, what scientists are currently studying about climate", Penn State Brandywine, Nov. 19 2016 (invited talk).
- PA Master Naturalist program at the Perkiomen Watershed Conservancy, Schwenksville, PA. Myths and Facts Behind Climate Change. March 2017, 2018.
- Resilience Training for Water and Wastewater Utilities Workshop, "Regional climate change and hydrology in Pennsylvania", June 29 2017, Harrisburg, PA.
- Tel Aviv University, School of Plant Sciences and Food Security, "How Human and natural Disturbance Affects the U.S. Carbon Sink". April 3, 2019, invited talk.
- Lehigh Valley Watershed Conference. "Climate Change and Hydrology in the Lehigh Valley: What the Future May Look Like", October 15, 2019, Lehigh University, Bethlehem, PA.

Abstracts (since joining Lehigh)

Kicklighter, D. W., Sokolov, A. P., Melillo, J. M., Felzer, B. S., Schlosser, C. A., and Cronin, T. W. **2008**. Importance of carbon-nitrogen interactions on the feedbacks between climate and the terrestrial carbon cycle. European Geosciences Union 2008 General Assembly, April, Vienna, Austria (talk).

Kicklighter, D. W., Sokolov, A. P., Melillo, J. M., Felzer, B. S., Schlosser, C. A., and Cronin, T. W. **2008**. Importance of nitrogen-limited plant productivity on the feedbacks between climate and the terrestrial carbon cycle. Ecological Society of America 93 Annual Meeting, August, Milwaukee, WI (talk).

Kicklighter, D. W., Gurgel, A. C., Melillo, J. M., Reilly, J., Cronin, T. W., Felzer, B. S., Paltsev, S., Schlosser, C. A. , and Sokolov, A. P. **2008**. Unintended environmental consequences of a global biofuels program. December AGU meeting, San Franciso, CA (talk).

Sokolov, A., Kicklighter, D., Melillo, J., Felzer, B., Schlosser, A., and Cronin, T. **2008**. Consequences of considering carbon/nitrogen interactions on the feedbacks between climate and the terrestrial carbon cycle. December AGU meeting, San Francisco, CA (talk).

Ren, W., Tian, H., Liu, M., Chen, G., Lu, C., Xu, X., Zhang, C., Pan, S., Felzer, B. S., Kicklighter, D. W., Melillo, J. M., Mu, Q., Running, S., and Zhao, M. **2008**. Comparative study of modeling the impacts of air pollution on carbon and water cycles in terrestrial ecosystems of China during 1980-2005. December AGU meeting, San Francisco, CA (talk).

Cronin, T.W., Felzer, B.S., Melillo, J.M., Kicklighter, D.W., and Schlosser, A. **2008**. Nitrogen limitation means more runoff in an elevated-CO_2 world. December AGU meeting, San Francisco, CA (poster).

Lee, E., Schlosser, C.A., Felzer, B., Kicklighter, D., Melillo, J., and Prinn, R. **2008**. Is plant migration restricted by available nitrogen supply in high latitudes? December AGU meeting, San Francisco, CA (poster).

Holland, B., Felzer, B., Pazzaglia, F., and Sahagian, D. **2009**. Impacts of climate change at watershed scale: Creating an ecological basis for "Smart Growth" and economic development in the post-industrial Lehigh Valley of Eastern PA. Spring AGU meeting, Toronto, ON (talk).

Briggs, C., Felzer, B., and Sahagian, D. **2009**. Cascading effects and systematic impacts of abrupt climate change: assessing ecological and social tipping points. AGU Chapman Conference (6/15/09-6/19/09), Columbus, OH (poster).

Felzer, B., Cronin, T., Kicklighter, D., Schlosser, C. A., and Melillo, J. **2009**. Plant physiological effects on summer drought in the western U.S. Fall AGU meeting, San Francisco, CA (poster).

Lee, E., Schlosser, C. A., Felzer, B. S. and Prinn, R. **2009**. Incorporating plant migration constraints into the NCAR CLM-DGVM model: projections of future vegetation distribution in high latitudes. Fall AGU meeting, San Francisco, CA (poster).

Kicklighter, D. W., Gurgel, A. C., Melillo, J. M., Reilly, J. M. Cronin, T. W., Felzer, B. S., Paltsev, S., Schlosser, C. A., and Sokolov, A. P. **2009**. Have indirect emissions from biofuels been exaggerated? Fall AGU meeting, San Francisco, CA (talk).

Felzer,B., Cronin, T., Schlosser, C. A., Kicklighter, D., Melillo, J., and Dangal, S. **2010**. Carbon-water coupling in forests, grasslands, and shrublands in the arid western U.S. Fall AGU meeting, San Francisco, CA (poster).

Dangal, S., Felzer, B. S., Hargreaves, B. R., and Yu, Z. **2010**. Effects of natural and anthropogenic disturbance on long-term carbon storage and productivity in the U.S. eastern temperate forest. Fall AGU meeting, San Francisco, CA (poster).

Felzer, B. S. and D. W. Kicklighter. **2011**. Carbon, nitrogen, and water response to land use and management decisions under a changing climate in Pennsylvania during the 21st century. Fall AGU meeting, San Francisco, CA.

Felzer, B. and Sahagian, D. 2012. Multimodel Comparison of Projected Regional Climate Change-Induced Ecologic and Hydrologic Impacts in the U.S. Fall 2012 AGU, oral presentation.

Schneck, L. and Felzer, B.S. 2012. Projected 21st Century Precipitation Increases in Eastern Pennsylvania and the Need for Adaptive Floodplain Management. Fall 2012 AGU, poster presentation, presented by Felzer.

Wang, A. and Felzer, B.S. 2012. Quantifying the role of land use change in ecosystem function for the U.S. using the Terrestrial Ecosystem Model. Fall 2012 AGU, poster presentation.

Liyi, X., Schlosser, C. A., Kicklighter, D.W., Felzer, B.S., Monier, E., and Tha Paw U, K. March 2012. Annual MSB meeting, Boulder, CO. Exploring the Terrestrial Ecosystem Response to Extreme Weather Events using Multiple Land Surface Models.

Felzer, B. S. and Phelps, P. 2013. Carbon dynamics of natural disturbance (storms and fire) in the eastern U.S.temperate forests. Fall 2013 AGU. poster presentation.

Andrews, T., Felzer, B., and Kothavala, Z. 2013. Watering the Northeast with Great Plains irrigation? Fall 2013 AGU. poster presentation.

Kothavala Z. and Felzer, B. 2013. Soil and vegetation parameter uncertainty on future terrestrial carbon sinks. Fall 2013 AGU. poster presentation.

Xu, Liyi, Kicklighter, D. W., Felzer, B.S., Schlosser, C.A., Chang, K.Y., and Paw U, K.T. 2013. Multi-Model Investigation of Ecological Response to Extreme Events. Fall 2013 AGU. poster presentation.

Bambach-Ortiz, N.E., Paw U, K.T., and Felzer, B.S. 2013. Coupling the multi-layer land surface model ACASA with a biogeochemical model TEM to better represent carbon and nitrogen dynamics. Fall 2013 AGU. poster presentation.

Felzer, B.S. and Phelps, P. 2014. Carbon dynamics of disturbance in the eastern U.S. temperate forest. NorthEast Geological Society of America meeting, Lancaster, PA. 3/25/14 (talk).

Kothavala, Z. and Felzer, B.S. 2014. Effects of nitrogen limitation on hydrological processes in a land model. European Geosciences Union, General Assembly. 5/1/14. Vienna, Austria. (talk)

Jiang, M., Zhang, J., Felzer, B.S., Hargreaves, B. 2014. Parameterization and Sensitivity Analysis of a Biogeochemical Model for Pennsylvania Dairy Pasture under Climate Change Scenarios. ESA, 8/14/14, Sacremento, CA.

Felzer, B.S. 2014. Importance of Past Human and Natural Disturbance in Present-Day Net Ecosystem Productivity. Fall AGU, 12/16/14, San Francisco, CA (poster)

Zhang, J. and Felzer, B. 2014. Effects of Climate Extremes on the Groundwater Recharge of the Ogallala Aquifer, USA, 1950-1999. 12/17/14, San Francisco, CA (poster)

Xu, L, Schlosser, C., Kicklighter, D., Paw U, K. T., Chang, K., Felzer, B., Kothavala, Z. 2014. Ecosystem Resiliency Study under Extreme Droughts using Multi-land Surface Models. Fall AGU, 12/18/14, San Franciso, CA (poster).

Felzer, B.S. 2015, How human and natural disturbance affects the U.S. carbon sink, Fall AGU, 12/16/15, San Francisco, CA (poster).

Jiang, M. and Felzer, B.S. 2015, Predictability of extreme precipitation over the conterminous U.S. 1949-2010, Fall AGU, 12/17/2015, San Francisco, CA (talk).

Jiang, M. and Felzer, B.S. 2015, Ecosystem implications of vision-driven land use scenarios in the Columbia Basin, Spring AGU, 5/6/2015, Montreal, Canada (poster).

Zhang, J. and Felzer, B.S. 2015. The Effect of Contrasting Wet and Dry Extreme Precipitation on Ecosystem Carbon Fluxes and Water Use Efficiency in the Southern Great Plains, United States, Fall AGU, 12/15/15, San Francisco, CA (poster)

Cheng, R. and Felzer, B.S. 2017. Understanding the associated effects of temperature and soil moisture on summer carbon fluxes of forest ecosystems in the contiguous United States. Jan. 22-26, 2017, AMS annual meeting, Seattle WA (poster).

Felzer, B., Jiang, M., Cheng, R., and Ember, C. Using weather data to determine dry and wet periods relative to ethnographic records. AGU, New Orleans, LA, 12/11/17 (poster).

Skoggard, I. ,Ember, C. R., Felzer, B., Pitek, E. 2019. Predicting Beliefs of Godly Involvement with Weather from Climatic Variability, American Anthropological Association Annual Meeting, Vanvouver, BC, Canada, November 21.

Felzer, B., 2019. "Forest Disturbance in the Context of Shifting Climate: Understanding Disturbances their Interactions as Agents of Forest Change". Fall AGU meeting. San Francisco, CA. December 13, 2019.

TEACHING AND RESEARCH ADVISING

Courses Taught

- Introduction to Physical Geology (introductory undergraduate): Bristol Community College, New Bedford, MA, Fall 2007
- Climate Modeling (mid-level undergraduate): Oberlin College, Oberlin, OH, Spring 2008
- Issues in Carbon Cycle (upper-level undergraduate): Oberlin College, Oberlin, OH, Spring 2008
- Science of Environmental Issues (EES004): Lehigh University, Fall 2008, 2009, Spring 2012, 2013, 2015, 2016, 2017, 2020 (teach climate section), Fall 2017 taught entire course, Spring 2021 (co-taught course with one other professor)
- Weather and Climate: Past, Present, and Future (EES023 or equivalent): Oberlin College, Oberlin, OH, Spring 2008, Lehigh University, Fall 2008, 2009, Spring 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2020, 2021

- Earth System Science (EES100): Lehigh University, Spring 2009, 2010, Fall 2010, 2011, 2012, 2013. 2014
- Earth System Modeling (EES403): Lehigh University, Fall 2009, 2010, 2011, 2012, 2013, 2015, 2017
- Intermediate Meteorology (EES395): Lehigh University, Fall 2012. 2014
- Atmospheric Science (EES342): Lehigh University, Fall 2016, 2019
- EES293: Fall 2010, 2014, Spring 2013, 2014. 2021
- EES393: Spring 2014, Fall 2016
- Investigations in EES (EES491), Fall 2011, 2013; Spring 2010, 2014, Fall 2016
- Introduction to the Earth System (EES80), Fall 2015
- Terrestrial Ecosystems (EES250), Fall 2016, 2018, 2020
- From Ice Age to Greenhouse Earth (EES090), Fall 2018, 2019
- The Challenges of Sustainability, Fall 2020

Advising

Undergraduate

- Freshman advisees: (from 2019): Sophie Collins, Jiayi Dai, Alexia Drey, Adalie Hogue, Hannah Moss, Mason Otley, Seabastian Steel, Tyler Waldvogel, Elisha Wilson, from 2020): Albin Beltran, Audrey Bowman, Rachel Caldwell-Glixon, Alice Chen, Andrew Choi, Mia Ciliberti, Terrence, Deegan, Ziyad Elsabbagh, Alexis Gil, Leah Gorfinkel, Harley Griner, Alexander Mandia, Grace McKelvey, Annette Miller, Alelia Pettus, Keely Schofield, Lauren Shebby, Kevin Simons, Aidan Singer, Stella Spatola
- Nonmajors: Mikayla Mayoryk, Jonathan Wood, Jennifer Dorogoff
- EES Majors: Ryan Peters, Matteo Piedra , Emma Galarza, Matthew LoBello, Rachel Charles, Jamil Robinson, Katherine Kimball, Joshua Spair, Anthony Iacoviello, Tess Jennings, Sarah Stern, Julian Traphagen, Nicole Etzel, Julia Keiser, Madeline Major, Fatima Mumtaz
- EES Minors: Olivia Newman
- Kristian Douma, summer 2009 employment
- Chang Liu, summer 2010 – Spring 2011, STEPS/EI research
- Katherine Spevok, Fall 2010
- Li Chen, summer 2011 STEPS/EI research
- Kevin Barrett, 2011/2012 senior thesis
- Lauren Schneck, 2012 summer research
- Trista Barthol and David Kolvek, 2012 summer and fall research
- Cathy Withers and Peter Phelps, 2013, 2014 summer and 2014 spring research.
- Jonathon Chang, 2014 spring research.
- Miles Necker, Malcolm Scobell, Casey Urban, summer and fall 2016/spring 2017 research
- Eli Jacobson, summer 2017

- Sarah Stankus and Erin Kelley, STEPS/EI, summer 2017
- Meredith Hoo, EES293, Fall 2018
- Mariah Matias, thesis committee, 2019/2020
- Vicki Jagdeo, thesis committee, 2020/2021
- Julia Keiser, EES293, Fall 2020
- Zoe Madson, EES293, Spring 2021

Master's

- Jared Kodero (8/21 – present)
- Christopher Andrade (8/20 – present)
- Shree Ram Sharma Dangal (11/09 – 5/11): Modeling the carbon and nitrogen dynamics following disturbance in eastern U.S. forests; M.S. awarded May 2011.
- Erik Mason (1/10 – 5/12): A comparison of early Holocene orbital insolation and present-day greenhouse gas forcings and their influences on Alaskan ecosystems; M.S. awarded May 2012.
- Patricia Monahan, M.S. committee
- Stephanie Hunt, M.S. committee
- Meng Zhao, M.S. committee
- Rui Cheng (8/15 – 5/17), Associated effects of temperature and soil moisture on summer carbon fluxes in the contiguous U.S. M.S. awarded May 2017.
- Liz Dyer, M.S. committee

Ph.D.

- Dannielle Waugh (8/20 – present)
- Sam Perugini, Ph.D. committee
- Michael Clifford, Ph.D. committee
- Mingkai Jiang (Fall 2012 – Spring 2016), On the History and Evidence of the Colwell Index in Quantifying Environmental Predictability, and Its Applications in Characterizing Precipitation Predictability in the Conterminous United States, Ph.D. awarded May 2016.
- Jien Zhang (Fall 2012 – Spring 2017), Detection and Effects of Climate Extremes on Hydrology and Ecosystems: Case Studies in California and the Great Plains, USA, Ph.D. awarded May 2017.
- Travis Andrews (Spring 2013 – Summer 2015), co-advisor
- Nicolas Bambach, UC-Davis, Ph.D. committee
- Xiuyuan Li, CEE, Ph.D. committee, Ph.D. awarded April 2019
- Xiao Zhu, CEE, Ph.D. committee, Ph.D. awarded August 2019
- Zhengyu Xia, Ph.D. committee, Ph.D. awarded April 2020

Post-Ph.D.

- Eungul Lee, Postdoctoral Fellow
- Audrey Wang, Postdoctoral Fellow
- Zavareh Kothavala, Research Scientist

Service

University

- Member, Lehigh Internal Review Committee (IRC), Fall 2016 – present.
- Member, Faculty Pride Council, Summer 2017 – May 2020.
- High Performance Computing Committee (renamed Research Computing Committee), Fall 2008-Aug. 2016, chaired subcommittee on Outreach and Education and member of subcommittee for strategic planning.
- Coorganized session (Energy and Environment) at Computational Engineering and Science/HPC Workshop, Lehigh University, Oct. 5 and 6, 2009.
- Co-led, Sandy: a Rare Storm or the New Norm, Panel discussion with B. Felzer, D. Sahagian, D. Casagrande, V. Dierolf, S. Gelatko (PPL). Nov. 13, 2012
- Lehigh Environmental Advisory Group (LEAG), Fall 2012-Aug. 2014.
- Subcommittee on Energy and Climate Sustainability, Spring 2013-present.
- Presentation and panel with NOAA director Kathy Sullivan, "Our Dynamic Planet" 4/9/14.

College

- CAS representative (and Chair for final year) to Faculty Committee on Student Life, Fall 2015 – Fall 2018.
- Freshman advisor, Fall 2019 – present; assigned ~19 new advisees each year, who remain my advisees until they chose a major

Department

- Graduate Instruction Committee, Fall 2008-Spring 2010, Fall 2017 – present, currently Chair
- EES representative to Library Liason Meeting, Fall 2015 – present.
- Undergraduate Instruction Committee, Fall 2015 – Spring 2016.
- Computer and AV Committee, Fall 2008-Spring 2012.
- Chair, Foster-Hewitt Committee, Fall 2008-Spring 2009
- Hosted EI/History seminar speaker, Ted Melillo (Franklin and Marshall College), 04/13/2009.
- Hosted EES Department seminar series speaker, Chris Forest (Penn State), 10/02/2009.
- Hosted EES Department seminar series speaker, Adam Schlosser (MIT), 10/16/2009.
- Hosted EES Department seminar series speaker, Yude Pan (USDA Forest Service), 10/15/10.
- Hosted EES Department seminar series speaker, Eungul Lee (Lehigh University), 12/10/10.
- Hosted EES Department seminar series speaker, Willow Hallgren (MIT), 4/15/11.
- Hosted EES Department seminar series speaker, Audrey Wang (Lehigh University), 3/2/2012.
- Hosted EES Department seminar series speaker, Ed Rastetter (MBL), 4/6/12.

- Hosted EES Department seminar series speaker, Danica Lombardozzi (NCAR), 10/19/2012.
- Hosted EES Department seminar series speaker, Cindy Shellito (U. Northern Colorado), 4/12/13.
- Hosted special guest speaker, Zachary Subin (Princeton University), 11/18/13.
- Hosted EES Department seminar series speaker, Tony Broccoli (Rutgers University), 3/14/14.
- Hosted EES Department seminar series speaker Michael MacCracken from Lawrence Livermore National Laboratory on 10/24/2014.
- Hosted EES Department seminar series speaker Adam Schlosser from MIT on 3/27/2015.
- Hosted EES Department seminar series speaker Hilary Christensen from Moravian College on 10/23/2015.
- Hosted EES Department seminar series speaker Erica Smithwick from Penn State one 9/29/2017.
- Hosted EES Department seminar series speaker Christopher Gough from Virginia Commonwealth University on 11/22/2019
- Hosted EES Department seminar series speaker Daniel Hayes from University of Maine on 12/13/2019
- Hosted EES Department seminar series speaker Bette Otto-Bliesner from the National Center for Atmospheric Research on 11/13/2020
- Hosted EES Department seminar series speaker Leslie Baker from University of Idaho on 2/12/2021

Professional

- Technical Review Committee on Global Change and Wildlife, The Wildlife Society, 2002-2004.
- Steering Committee on Indicators for Ecological Effects of Air Quality to the EPA, The Heinz Center, 2006 – 2009, member of Analysis subcommittee.
- DOE NICCR (National Institute for Climatic Change Research), Midwestern Regional Center Review panel member, Minneapolis, Oct. 13, 2009.
- NSF Climate Change Education Partnership Phase I (CCEP-I), Review panel member, Washington D.C. July 15-16, 2010.
- Annual NCAR CCSM Workshops, Breckenridge, CO, June 2009, 2010, 2012. Member of Biogeochemical Working Group.
- CCSM Land Model and Biogeochemistry Working Group meetings, NCAR, Boulder, CO., March 2011, presented Erik Mason's graduate research.
- Organized poster and oral session at Fall 2011 AGU meeting, San Francisco, CA, B38 Understanding Terrestrial Ecosystem Carbon Fluxes, Structure, and Dynamics by Model Data Synthesis Across Space and Time
- Organized
- Macrosystems Research Team Meeting at Lehigh with attendees from MIT, MBL, and UC-Davis. 2/4/13-2/5/13.

- Organized poster and oral session at Fall 2013 AGU meeting, San Francisco, CA. H090: Uncertainty in Water Management: Risk Analysis, Decision Support and Law, with special focus on Hydrometeorological Scaling from Continents to Watersheds.
- President (2016/2017) and Co-secretary, Lehigh Chapter Sigma Xi, starting summer 2014.
- Member of American Geophysical Union, American Meteorological Society, Ecological Society of America
- Hosted Michael Mann (from Penn State) for Sigma Xi 2016 Annual Distinguished Lecturer at Lehigh University. "The Madhouse effect: how climate change denial is threatening our planet, destroying our politics, and driving us crazy. April 14, 2016.
- Lecture at Jenner's Pond Retirement Community. "The Science Behind Climate Change: Misperceptions and Context". March 2018 (invited by Climate Voices program).
- Guest Editor, Special Issue of Atmosphere. 2020. "Land-atmosphere interactions: Biogeophysical and biogeochemical feedbacks". 4 articles: 11(5, 6). 10(10,12). IF 2.397.
- Reviewed 6 articles in 2020. Reviewed 4 articles in 2019. Reviewed 7 articles and 1 proposal in 2018. Reviewed 8 articles, 1 book chapter, 1 NSF proposal, and 1 Lehigh proposal in 2017. Reviewed 8 articles, 1 Lehigh proposal, 1 European proposal, 1 NSF proposal, and 1 external tenure review in 2016; Reviewed 6 journal articles (and 3 revisions) + 2 proposals in 2015; Reviewed 14 journal articles in 2014; 7 journal articles in 2013; 5 journal articles 2012 + 1 NSF proposal, 4 journal articles in 2011; 2 journal articles in 2010; DOE and NOAA proposals in 2009; 1 journal article + DOE proposal in 2008