

**Danielle S. Grogan**  
**Research Assistant Professor**  
Curriculum Vitae

Earth Systems Research Center  
Institute for the Study of Earth, Oceans, and Space  
University of New Hampshire  
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**Education**

Ph.D. Earth and Environmental Sciences, University of New Hampshire, 2016  
M.S. Geological Sciences, Brown University, 2011  
B.A. Mathematics, Smith College, 2009

**Professional Experience**

2021 – present Research Assistant Professor, University of New Hampshire  
2025 – present Adjunct Instructor, Department of Natural Resources and the Environment, University of New Hampshire  
2025 – present Confidential Advocate, UNH SHARPP Office of Interpersonal Violence Awareness, Prevention, and Advocacy  
2023 – 2024 Consultant, Food and Agricultural Organization of the United Nations  
2022 Consultant, World Bank Group  
2016 – 2021 Research Scientist II, University of New Hampshire  
2014 – 2016 NSF Graduate Research Fellowship  
2014 NSF East Asia Pacific Summer Institute (EAPSI) Fellowship  
2011 – 2014 Graduate Research Assistant, University of New Hampshire  
2010 NSF-GK12 Fellowship  
2009 Graduate Research Fellowship, Brown University  
2008 – 2009 Smith College Undergraduate Research Fellowship  
2007 – 2009 Smith College mathematics department teaching assistantship  
2007 NSF Research Experience for Undergraduates (REU) Summer Fellowship at University of Minnesota at Minneapolis

**Research statement**

Dr. Danielle Grogan is a member of the Water Systems Analysis Group lab, which studies the role of water in human and natural Earth systems. Dr. Grogan's work includes examining how different sources of water – glaciers, snow, rain, and groundwater – contribute to food production, electricity generation, and ecosystems, with a theme of evaluating water's role in achieving the United Nations' Sustainable Development Goals. Her work also aims to understand how climate change will alter water sources and water demands, and uses a combination of computer models, geospatial data analysis, and hydro-economic methods.

### Professional Affiliations

GLASSNET Leadership Team, 2019-present  
American Geophysical Union, 2011-present  
NASA Sea Level Change Science Team 2020-present  
NASA High Mountain Asia Science Team 2015-present  
UNH Water Systems Analysis Group 2011-present

### Awards

2023 UNH Writing Academy scholar  
2015 AGU Outstanding Student Poster Award  
2014 NSF East Asia-Pacific Summer Institute (EAPSI) Fellowship  
2012 NSF Graduate Research Fellowship (GRFP)  
2010 NSF scholarship to attend the Urbino Summer School in Paleoclimate

### Grants Funded as PI, Co-PI, or Co-I

Food and Agricultural Organization of the United Nations: Globally geospatially explicit data and analysis on crop water requirements and related hydrologic data sets. 2025. **D. Grogan (PI)**, S. Zuidema (Co-PI). \$49,792.

NSF CSSI: Elements: OpenGHM – Enhancing reproducibility in global hydrologic modeling. 2025 – 2028. **D. Grogan (PI)**, L. Zhao (Co-PI, Purdue University). \$599,878.

NSF REU Site: Sensors in Earth and Space Science: How We Observe Our Planet. 2023-2026. **D. Grogan (PI)**, K. Ziervogel (Co-PI). \$450,324.

NSF MacroSystems Biology Research Assistantships for High School Students (RAHSS) Supplement. 2020 – 2021. L. Burakowski (PI), A. Contosta (Co-PI), and **D. Grogan (Co-PI)**. \$6,000.

NSF AccelNet: GLASSNET: Networking Global to Local Analyses to Inform Sustainable Investments in Land and Water Resources. 2020 – 2024. T. Hertel (PI), S. Polaski (Co-PI), X. Song (Co-PI), **D. Grogan (Co-PI)**. \$1,999,991.

NASA High Mountain Asia Team (HiMAT): Peak water in High Mountain Asia: Quantifying future cryosphere change to understand downstream human impacts. 2019 – 2022. D. Rounce (PI), M. Fahnstock (Co-I), **D. Grogan (Co-I)**, R. Hock (Co-I), R. Lammers (Co-I), D. Shean (Co-I). \$1,149,472.

NASA Sea Level Change Team (N-SLCT): Quantifying contributions from glaciers and terrestrial hydrology to recent and future sea level change. 2019 – 2024. D. Rounce (PI), M. Fahnstock (Co-I), **D. Grogan (Co-I)**, R. Hock (Co-I), R. Lammers (Co-I). \$1,398,377.

UNH ESRC Iola Hubbard Climate Change Endowment: Open-source tools for northeastern North America snow data. 2019. **D. Grogan (PI)**, A. Contosta (Co-I), E. Burakowski (Co-I), M. Martin (Co-I). \$14,615.

NSF MacroSystems Biology (MSB) Early Career Award: A lengthening vernal window: how vernal asynchronies in energy, water, and carbon fluxes impact ecosystem function. 2018 – 2021. E. Burakowski (PI), **D. Grogan (Co-PI)**, A. Contosta (Co-PI). \$298,597.

#### **Involvement in other funded grants**

NASA Sea Level Change Team: Trends and Uncertainties of Future Global Over-Land Water Cycle Projections for Sea Level Impacts. 2024. Richard Lammers (PI), **D. Grogan (senior personnel)**.

UNH ESRC Iola Hubbard Climate Change Endowment: High-resolution hydroclimate data for the Contiguous United States (CONUS), 1950 – 2100. 2023. Elizabeth Burakowski (PI), **D. Grogan (team member)**.

NSF INFEWS Career-Life Balance Supplement. 2022. Richard Lammers (PI), **D. Grogan (senior personnel)**.

DOE CRA: Understanding Multi-Stressor and Multi-Scale Drivers of Feedbacks, Cascading Failures, and Risk Management Pathways within Complex MSD Systems. 2021 – 2026. K. Fisher-Vanden (PI), **D. Grogan (senior personnel)**.

UNH Collaborative Research Excellence (CoRE) Initiative: Strengthening Existing Centers: Developing a Pathway toward Justice, Equity, Diversity, and Inclusion within EOS through Recruitment, Collaboration, and Research (JEDI-EOS). 2021. H. Spence (PI), **D. Grogan (program coordinator)**.

NSF Innovations at the Nexus of Food, Energy, and Water Systems: INFEWS/T2: Identifying sustainability solutions through global-local-global analysis of a coupled water-agriculture-bioenergy system. 2018 – 2022. T. Hertel (PI), **D. Grogan (senior personnel)**.

DOE Program on Coupled Human and Earth Systems (PCHES). 2017 – 2021. J. Weyant (PI), **D. Grogan (other personnel)**.

NSF Innovations at the Nexus of Food, Energy, and Water Systems: INFEWS/T2: Social-ecological-technological solutions to waste and reuse in food, energy, and water systems (ReFEWS). 2015 – 2020. L. Alessa (PI), **D. Grogan (post doc/other personnel)**.

DOE PIAMDDI: Research in Integrated Assessment Inter-Model Development, Testing, and Diagnostics. 2013 – 2017. Weyant (PI), **D. Grogan (graduate student)**.

NSF Water, Sustainability, and Climate (WSC): Collaborative: Crops, Climate, Canals and the Cryosphere in Asia – Changing Water Resources around the Earth's Third Pole. 2010 – 2015. S. Frohling (PI), **D. Grogan (graduate student)**.

American Chemical Society Petroleum Research Fund: Molecular-level investigation of Lake Level and Ecosystem Control of Organic Matter Sources in Oil Shale of the Green River Formation, Wyoming, Colorado, and Utah. 2009 – 2010. J. Whiteside (PI), **D. Grogan (graduate student)**.

### **Student Research Grants**

Rapid climate change: the role of large lakes as Eocene greenhouse gas sources and sinks. Sigma Xi Grants-in-Aid 2011.

The Enigma of Warm Climates: A hydrologic reconstruction of Earth's most recent hothouse with analysis of cyclical climate forcing. 2010 GSA Graduate Student Research Grant.

Analyzing cyclicity and hydrologic controls of organic matter sources in oil shale of the Green River Formation; Wyoming, Colorado, and Utah. 2010 J. Ben Carsey, Sr. AAPG Grants-in-Aid.

### **Courses Taught**

NR504 Freshwater Resources, spring 2025 for the UNH Natural Resources Department

### **Student Advising & Committees**

#### **Primary advisor for:**

PhD student Amna Omer, UNH Natural Resources and Earth System Science PhD program, 2024 – present

Undergraduate EOS REU student Maia Lippay, 2025

Undergraduate EOS REU student Rebecca “Becker” Gibson, 2024

#### **Committee member for:**

PhD student Kristin Green, UNH Natural Resources and Earth System Science PhD program (2025 – present)

PhD student Lara Munro, UNH Natural Resources and Earth System Science PhD program (2023 – present)

PhD student Kavitha Srikrishnan, Purdue University department of Natural Resource Economics PhD program (2025 – present)

PhD student Yifan Luo, Cornell University, Civil and Environmental Engineering (2025 – present)

M.S. student Anna Lowein, UNH Dept. Natural Resources and the Environment (2019 – 2021)

### **Professional Service**

Journal Guest Editor for *Environmental Research Letters* focus collection on Groundwater and Society: Sustainably Managing an “Invisible” Resource, <https://iopscience.iop.org/collections/erl-240426-538>

Organizer of the *Groundwater and Society Workshop*, at Penn State University, May 8 - 10, 2024. <https://www.pches.psu.edu/groundwater-workshop/>

Organizer of the *WBM Community Workshop* at the University of New Hampshire. July 18 – 19, 2023

Co-organized the GLASSNET Early Career Workshop series:

Chaired first workshop, titled “Proposal Success: Interdisciplinary, International, and Inclusive”. September 21, 2022.

Chaired third workshop, titled “GLASSNET Early Career Project Launch Award”. April 5, 2023.

Convener of the GLASSNET Cyberinfrastructure Workshop: “Cyberinfrastructure for GLASSNET Collaborations”. September 14, 2021.

Reviewer for journals: AIMS Agriculture and Food, Big Earth Data, Climatic Change, Environmental Research Letters, Frontiers in Earth Science, Geoscientific Model Development, Journal of Applied Remote Sensing, Journal of Hydrology, Journal of Hydrometeorology, Nature Communications, Nature Water, Npj Clean Water, Science of the Total Environment, Scientific Data, Water Resources Research

Served on NSF grant proposal review panels: 2022, 2023, 2024, 2025

Served on DOE grant proposal review panel: 2024

Judge for the AGU Outstanding Student Poster Award Competition (OSPA): 2018

### **University Service**

2024 – 2026, Director of EOS Research Experience for Undergraduates (REU) Site

2024 – present, EOS representative to the UNH University Commission on Community, Equity, and Diversity

2024, EOS representative to the UNH Accessibility Task Force

2023 – 2025, UNH ESRC Iola Hubbard Climate Change Endowment review panelist

2020 – present, Founding member of the EOS Justice, Equity, Diversity, and Inclusion (JEDI) Committee; Co-lead of the Recruitment working group

2019, Judge for the UNH Undergraduate Research Conference

2017, Judge for the UNH Graduate Research Conference

2010 – 2011 NSF GK12 student representative for Project ARISE (Advancing Rhode Island Science Education)

### **Public Service and Outreach**

2021 - 2022, Math tutor for Second Start, a non-profit adult education program, Concord, NH.

- 2021, Panelist for the SEE Science Center's *Science on Tap* public outreach program, Manchester, NH (virtual).
- 2019, Development of open-source R coding extension for a Global Learning and Observations to Benefit the Environment (GLOBE) teaching module on system dynamics modeling, available through GitHub (<https://github.com/daniellegrogan/Paperclip>).
- 2019, Mentor high school students in Old Town, ME, on Global Learning and Observations to Benefit the Environment (GLOBE) science protocols.
- 2014, Presenter at the Pierce School Climate Change Symposium, organized by the Boston University NSF-GK12 program. Brookline, MA.
- 2013, Presenter at the UNH Tech Camp for middle school students at UNH.
- 2013, Panelist at the Women in Science and Technology (WIST) forum at White Mountain Community College. Berlin, NH.
- 2013, Discussion facilitator at the Pierce School Climate Change Symposium, organized by the Boston University NSF-GK12 program. Brookline, MA.
- 2012, Math tutor for GED students, Dover Adult Learning Center, Dover, NH.
- 2009 –2010, Vartan Gregorian elementary school science volunteer, Providence, RI.
- 2010 – Rhode Island Science Olympiad paleontology section facilitator at the Community College of Rhode Island campus.
- 2005 – 2009 Smith College Women in Athletics Day activities volunteer, Smith College.

### **Media**

2020: NewsCenter Maine interview:

<https://www.newscentermaine.com/article/news/local/207/as-the-climate-warms-the-northeast-will-likely-see-a-longer-mud-season/97-f78f5565-1409-460c-92e3-9b7fb7ea8d73>

2020: New Hampshire Union Leader interview:

[https://www.unionleader.com/news/environment/unh-research-less-snow-longer-mud-season-could-alter-rivers/article\\_175f0b24-de73-51a8-93b7-44939991c1d9.html](https://www.unionleader.com/news/environment/unh-research-less-snow-longer-mud-season-could-alter-rivers/article_175f0b24-de73-51a8-93b7-44939991c1d9.html)

### **Publications in review**

Alipour A., Ye H., Sharma S., Zuidema S., **Grogan D.**, Keller K. Characterizing Parameter Uncertainty on Water Balance Model Soil Moisture Estimates over US Agricultural Lands. *Journal of Hydrology, in review.*

- Cisneros-Pineda A., Haqiqi I., Liu J., Zuidema S., **Grogan D.S.** Quantifying the impacts of excess water on agricultural losses and the role of adaptive infrastructure. *Earth's Future*, in review.
- Constosta A.R., Burakowski E.A., Frey S.D., Green M.B., **Grogan D.S.**, Olson J., Perry A.L., Varner R.K. Winter warming lengthens the vernal window and accelerates soil respiration. *Global Change Biology*, in review.
- Femeena P.V., Daenzer K., Frohling S., **Grogan D.**, Nucciarone J., Calvin K., Lammers R.B., Fisher-Vanden K. A coupled hydrologic-agroeconomic modeling framework to evaluate adaptive irrigation strategies under groundwater withdrawal restrictions. *Agricultural Water Management*, in review.
- Femeena P.V., Daenzer K., Frohling S., **Grogan D.**, Nucciarone J., Calvin K., Lammers R.B., Fisher-Vanden K. How can crop production adapt to growing groundwater restrictions in the West? in review.
- Grogan D.S.**, Lisk M.D., Zuidema S., Zheng J., Fisher-Vanden F., Lammers R.B., Olmstead S.M., Fowler L., Prusevich A.A. Bringing hydrologic realism to water markets. in review.
- Haqiqi I., Hertel T.W., **Grogan D.S.**, The impact of a compound weather-and-tariff stress on global food production and trade. *Environmental Research: Food Systems*, in review.
- Reinecke R., B athge A., Dietrich R., Gnann S., Gosling S.N., **Grogan D.**, Hartmann A., Kollet S., Kumar R., Lammers R., Liu S., Liu Y., Moosdorf N., Naz B., Nazari S., Orazulike C., Pokhrel Y., Schewe J., Smilovic M., Stokal M., Wada Y., Zuidema S., de Graaf I. The ISIMIP Groundwater Sector: A Framework for Ensemble Modeling of Global Change Impacts on Groundwater. *Geoscientific Model Development*, in review.

## **Publications**

- Mikulis A.E., **Grogan D.S.**, Shattuck M.D., Matso K., McDowell W.H. (2026) Biogeochemical stressors and ecological response in a nitrogen-impaired New England estuary. *Journal of Geophysical Research: Biogeosciences*, 131, e2025JG008894. <https://doi.org/10.1029/2025JG008894>.
- Lafferty D.C., **Grogan D.S.**, Zuidema S., Haqiqi I., Alipour A., Keller K., Sriver R.L. (2025) Combined climate and hydrologic uncertainties shape projections of future soil moisture in the eastern United States. *Earth's Future*, 13, e2025EF006040, <https://doi.org/10.1029/2025EF006040>.
- Prusevich A., Lammers R.B., **Grogan D.S.**, Zuidema S., Meko D., Velocogna I. (2025) Decomposing land surface total water storage in the Indus, Ganges, and Brahmaputra basins. *Frontiers in Earth Science*, 13:1551218. doi: 10.3389/feart.2025.1551218.

- Konar M., Fisher-Vanden K., **Grogan, D.S.**, Haqiqi I., Mejia A., Puma M.J. (2025) Groundwater and trade: Towards an interdisciplinary consensus and roadmap for future research. *Environmental Research Letters*, 20 071002, 10.1088/1748-9326/adda61.
- Rounce D., Hock R., Prusevich A.A., **Grogan D.S.**, Lammers R.B., Huss M., Bliss A., Zan B. (2025) Downstream hydrology reduces glaciers' direct contribution to sea-level rise. *Geophysical Research Letters*, 52, e2025GL114866. <https://doi.org/10.1029/2025GL114866>.
- Lisk M.D., **Grogan D.S.**, Zuidema S., Zheng J., Caccese R., Peklak D., Fisher-Vanden K., Lammers R.B., Olmstead S.M., Fowler L. (2024) Harmonized database of Western U.S. water rights (HarDWR) v.1. *Scientific Data*, 11, 598, <https://doi.org/10.1038/s41597-024-03434-6>.
- Wisser D., **Grogan D.S.**, Lanzoni L., Tempio G., Cinardi G., Prusevich A., Glidden S. (2024) Water use in livestock agri-food systems and its contribution to local water scarcity: A spatially distributed global analysis. *Water*, 16, 1681, <https://doi.org/10.3390/w16121681>.
- Cisneros-Pineda A., Liu J., **Grogan D.**, Hertel T. (2024) Linkages between Riverine Flooding Risk and Economic Damage over the Continental United States. *Natural Hazards*, 120, 5941-5952, <https://doi.org/10.1007/s11069-024-06445-z>.
- Haqiqi I., **Grogan D.S.**, Horeh M.B., Liu J., Baldos U.L.C., Lammers R.B., Hertel T.W. (2023) Local, regional, and global adaptations to a compound pandemic-weather stress event. *Environmental Research Letters*, 18(3), 035005, doi: 10.1088/1748-9326/acbbe3.
- Grogan D.S.**, Zuidema S., Prusevich A., Wollheim W.M., Glidden S., Lammers R.B. (2022) Water balance model (WBM) v.1.0.0: a scalable gridded global hydrologic model with water-tracking functionality, *Geoscientific Model Development*, 15, 7287–7323, <https://doi.org/10.5194/gmd-15-7287-2022>.
- Woo J., Zhao L., **Grogan D.S.**, Haqiqi I., Lammers R., Song C.X. (2022) C<sup>3</sup>F: A collaborative container-based model coupling framework. In *Practice and Experience in Advanced Research Computing (PEARC '22)*. Association for Computing Machinery, New York, NY, USA, Article 7, 1–8. <https://doi.org/10.1145/3491418.3530298>.
- Burakowski E.A., Sallade S., Constosta A., Sanders-DeMott R., **Grogan, D.S.** (2022) A Season of Change: Tracking climate change using low-cost instruments during the vernal window, the winter-spring shoulder season. *American Biology Teacher*, 84(4), pp. 219-222, ISSN 0002-7685, electronic ISSN 1938-4211. <https://doi.org/10.1525/abt.2022.84.4.219>.
- Burakowski E.A., Contosta A.R., **Grogan D.S.**, Nelson S.J., Garlick S., Casson N. (2022) The future of winter in Northeastern North America: climate indicators portray continued or accelerated warming and loss of snow that will impact ecosystems and

communities. *Northeastern Naturalist*, 28(11): 180-207,  
<https://doi.org/10.1656/045.028.s1112>.

**Grogan D.S.**, Frolking S., Wisser D., Prusevich A., Glidden S. (2022) Global gridded crop harvest, production, yield, and monthly physical area data circa 2015. *Scientific Data* 9(15). <https://doi.org/10.1038/s41597-021-01115-2>.

Rimsaite R., Fisher-Vanden K., Olmstead S., **Grogan D.S.** (2021) How well do U.S. western water markets convey economic information? *Land Economics*, 97(1): 1-16, DOI: 10.3368/wple.97.1.050719-0061R.

Rougé C., Reed P.M., **Grogan D.S.**, Zuidema S., Prusevich A., Glidden S., Lamontagne J. R., Lammers, R. B. (2021) Coordination and Control: Limits in Standard Representations of Multi-Reservoir Operations in Hydrological Modeling. *Hydrology and Earth System Sciences*, 25, 1365-1388, <https://doi.org/10.5194/hess-25-1365-2021>.

Haqiqi I., **Grogan D.S.**, Hertel T., Schlenker W. (2021). Quantifying the impacts of compound extremes on agriculture. *Hydrology and Earth System Sciences*, 25, 551–564, <https://doi.org/10.5194/hess-25-551-2021>.

**Grogan D.S.**, Burakowski E.A., Contosta A.R. (2020) Snowmelt control on spring hydrology declines as the vernal window lengthens. *Environmental Research Letters*, 15, 114040. <https://doi.org/10.1088/1748-9326/abbd00>.

Zuidema S., **Grogan D.S.**, Prusevich A.A., Lammers R.B., Gilmore S., Williams P. (2020) Interplay of changing irrigation technologies and water reuse: Example from the Upper Snake River Basin, Idaho, USA. *Hydrology and Earth System Sciences*, 24, 5231-5249, <https://doi.org/10.5194/hess-24-5231-2020>.

Mishra S.K., Veselka T.D., Prusevich A.A., **Grogan D.S.**, Lammers R.B., Ali S.H., Christian M.H. (2020) Differential impact of climate changes on the hydropower economics of Karakorum and Himalayan river basins. *Frontiers in Earth Science*, 8, doi:10.3389/fevns.2020.00026.

Liu J., Hertel T., Lammers R., Prusevich A., Baldos U., **Grogan D.S.**, Frolking, S. (2017) Achieving sustainable irrigation water withdrawals: Global impacts on food security and land use. *Environ. Res. Lett.* 12, 104009, doi:10.1088/1748-9326/aa88db.

**Grogan D.S.**, Wisser D., Prusevich A., Lammers R.B., Frolking S. (2017) The use and re-use of unsustainable groundwater for irrigation: a global budget. *Environmental Research Letters*, 12, doi 10.1088/1748-9326/aa5fb2.

**Grogan D.S.**, "Global and regional assessments of unsustainable groundwater use in irrigated agriculture" (2016). *Doctoral Dissertations*. 2. <https://scholars.unh.edu/dissertation/2>.

Zaveri E. \*, **Grogan D.S.\***, Fisher-Vanden K., Frolking S., Lammers R.B., Wrenn D.H., Prusevich A., Nicholas R.E. (2016) Invisible water, visible impact: Groundwater use in

Indian agriculture under climate change. *Environmental Research Letters*, 11, doi:10.1088/1748-9326/11/8/084005.

**Grogan D.S.**, Zhang F., Prusevich A., Lammers R.B., Wisser D., Glidden S., Li C., Frohling S. (2015) Quantifying the link between crop production and mined groundwater irrigation in China. *Science of the Total Environment*, 511:161-75. doi:10.1016/j.scitotenv.2014.11.076.

Zhang F., Li C., Wang Z., Glidden S., **Grogan D.S.**, Li X., Cheng Y., Frohling S. (2015) Modeling impacts of management on farmland soil carbon dynamics along a climate gradient in Northwest China during 1981–2000. *Ecological Modelling*, 312:1-10, doi:10.1016/j.ecolmodel.2015.05.006.

Whiteside J.H., **Grogan D.S.**, Olsen .P, Kent D.V. (2011) Climatically driven biogeographic provinces of Late Triassic tropical Pangea. *Proceedings of the National Academy of Sciences*, 108(22), 8972-8977.

\*Denotes equal first coauthors.

#### **Publications not peer reviewed**

**Grogan D.S.**, Prusevitch A., Lammers R. (2023) Groundwater resources through the 21st century. Background paper prepared for the World Bank report *The Hidden Wealth of Nations: the economics of groundwater in times of climate change*, World Bank, Washington, DC.

#### **Data Products**

Lafferty D., **Grogan D.**, Zuidema Z., Haqiqi I., Alipour A., Keller K., Sriver R. (2025) Combined climate and hydrologic uncertainties shape projections of future soil moisture in the eastern United States, ESS Open Archive, <https://doi.org/10.22541/essoar.173878030.00737104/v1>

Lisk, M., **Grogan, D.**, Zuidema, S., Caccese, R., Peklak, D., Zheng, J., Fisher-Vanden, K., Lammers, R., Olmstead, S., & Fowler, L. (2023). Harmonized Database of Western U.S. Water Rights (HarDWR) (Version v1) [Data set]. MSD-LIVE Data Repository. <https://doi.org/10.57931/2205619>

**Grogan D.S.**, Zuidema S., Prusevich A., Wollheim W.M., Glidden S., and Lammers R.B. (2022) University of New Hampshire Water Balance Model Ancillary Data for use with the WBM Open Source Release Version 1.0. <https://wbm.unh.edu/>. <https://dx.doi.org/10.34051/d/2022.2>

A.A. Prusevich, **D.S. Grogan**, R.B. Lammers, and D.R. Rounce (2021) *High Mountain Asia Rasterized PyGEM Glacier Projections with RCP Scenarios, Version 1*. doi: <https://doi.org/10.5067/H118TCMSUH3Q>.

**Grogan D.**, Prusevich, A., Frolking, S., Wisser, D., Glidden, S. (2021) [GAEZ+ 2015 Monthly Cropland Data: Global gridded monthly crop physical area for 26 irrigated and rainfed crops](#), MyGeoHUB. [doi:10.13019/J2BH-VB41](#).

Haqiqi I., **Grogan, D.**, Hertel, T., Schlenker W. (2020) [Data Sets for: Quantifying the Impacts of Compound Extremes on Agriculture and Irrigation Water Demand](#). Purdue University Research Repository. [doi:10.4231/OM14-EY38](#).

Frolking S., Wisser D., **Grogan D.**, Proussevitch A., Glidden S. (2020) GAEZ+\_2015 Crop Harvest Area, <https://doi.org/10.7910/DVN/KAGRFI>, Harvard Dataverse, V1.

Frolking S., Wisser D., **Grogan D.**, Proussevitch A., Glidden S. (2020) GAEZ+\_2015 Crop Production, <https://doi.org/10.7910/DVN/KJFUO1>, Harvard Dataverse, V1.

Frolking S., Wisser D., **Grogan D.**, Proussevitch A., Glidden S. (2020) GAEZ+\_2015 Crop Yield, <https://doi.org/10.7910/DVN/XGGJAV>, Harvard Dataverse, V1.

### **Code Products**

Grogan, D., Prusevich, A., Glidden, S., Zuidema, S., & Lisk, M.D. (2023). wsag/WBM: WBM v.2.0.0 (v2.0.0). Zenodo. <https://doi.org/10.5281/zenodo.8338753>

Prusevich, A., **Grogan, D.**, Zuidema, S., Wollheim, W., Glidden, S., & Lammers, R. (2023). WBM v1.0.0 (v1.0.0). MSD-LIVE Data Repository. <https://doi.org/10.5281/zenodo.6263097>

Haqiqi, I., Danielle Grogan, Thomas Hertel, Wolfram Schlenker (2020). [Model Code for: Quantifying the Impacts of Compound Extremes on Agriculture and Irrigation Water Demand](#). Purdue University Research Repository. [doi:10.4231/Q07D-J369](#).

### **Invited Talks and Guest Lectures**

Guest lecturer for NR504 Freshwater Resources at the UNH Department of Natural Resources, March, 2024.

**Grogan, D.S.**, and Zuidema, S. “Development of groundwater methods in a global hydrologic model”. Guest speaker for the Potsdam Institute for Climate Impact Research (PIK) Land Use Resilience research group seminar series. June 12, 2023.

Guest lecture for Purdue University Graduate Course AGEC 528: Global Change and the Challenge of Sustainably Feeding a Growing Planet. “Water Availability: Constraints and Opportunities”, Feb. 1, 2022 and Jan. 31, 2023.

GLASSNET Cyberinfrastructure Workshop speaker: Sept 14, 2021. <https://mygeohub.org/groups/glassnet/learning-hub/workshops/summerworkshopseries/cyberinfrastructure>

Guest lecturer for Global Environmental Changes at the UNH Earth Science Department, May 4, 2021.

Guest lecturer for Freshwater Resources at the UNH Department of Natural Resources, March 12, 2021.

Guest lecture & lab for Purdue University Graduate Course AGEC 528: Global Change and the Challenge of Sustainably Feeding a Growing Planet. “Water Availability: Constraints and Opportunities”, March 16 & 18, 2021.

**Grogan, D.S.**, Burakowski E.A., and Contosta A.R. 2020. “Is Climate Change Lengthening the Vernal Window?” presented at the Symposium on Climate Change in Maine’s Mountains, *Invited*, October 26, 2020.

Guest lecture & lab for Purdue University Graduate Course AGEC 528: Global Change and the Challenge of Sustainably Feeding a Growing Planet. “Water Availability: Constraints and Opportunities”, March 24 & 26, 2020.

Tufts University Civil and Environmental Engineering seminar, Invited speaker. “Global food security with sustainable groundwater withdrawals: a collaboration between hydrologists and agricultural economists”, September 2019.

**Grogan, D.S.**, Osmanoglu, B., Hock, R., Lammers, R.B., Froking, S., Nicholls, S.D., Rounce, D., Montesano, P., Prousevitch, A.A., Neigh, C.S.R. 2018. Cryospheric connections – Tracking the fate of glacier and snow melt water in High Mountain Asia: Implications for regional food security. Abstract C44B-01, *Invited*, presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.

Guest lecturer for Environmental Modeling at the UNH Department of Natural Resources, March 2018.

Guest lecturer for the Natural Resources and Earth System Science (NRESS) student seminar at the UNH Graduate School, 2017.

### **Conference Abstracts**

Burakowski E., Bones J., Clayton J., Contosta A., **Grogan D.S.**, Grunes A., Hofman H., Lineman B., McCarthy C., McKim S., Murray G., Nadeau C., Nelson S., Stewart M., Webb M., Zuidema S, Zukiwicz L. 2025. The Northeast Snow Survey (NESS) Feasibility Study: The Role of Historical and Future Snowpack Conditions in Disciplined Network Design. Abstract C33D-0994 presented at 2025 Fall Meeting, AGU, New Orleans, LA, 15-19 Dec.

Keese A., **Grogan D.S.**, Ziervogel K., Mandel T., Venegas G., Froburg E. 2025. Sensors in Earth, Oceans, and Space Science – How We Observe Our Planet: An Interdisciplinary REU at the University of New Hampshire. Abstract ED21C-0537 presented at 2025 Fall Meeting, AGU, New Orleans, LA, 15-19 Dec.

Luo Y., **Grogan D.S.**, Zuidema S., Lammers R.B., Zheng J., Lisk M., Fisher-Vanden K., Olmstead S., Srikrishnan V. 2025. Water Scarcity Attribution in the Western U.S. using Interpretable Machine Learning Emulators of Process-Based Hydrologic Models.

- Abstract H41V-1500 presented at 2025 Fall Meeting, AGU, New Orleans, LA, 15-19 Dec.
- Ray S., **Grogan D.S.**, Haqiqi I., Hertel T.W. 2025. Hydrological and Market-Mediated Spillovers from Sustainable Groundwater Management in South Asia. Abstract GC24D-04 presented at 2025 Fall Meeting, AGU, New Orleans, LA, 15-19 Dec.
- Gibson R. and **Grogan, D.** 2025. The Future of Hydropower in New England. Presented at the University of New Hampshire Undergraduate Research Conference, April 23, 2025, Durham, NH. <https://scholars.unh.edu/urc/638/>.
- Luo Y., **Grogan, D.S.**, Zuidema S., Fisher-Vanden K., Olmstead S., Srikrishnan V. 2024. Disentangling climate and socioeconomic contributions to water shortage in the western US. Abstract GC53C-0387 presented at 2024 Fall Meeting, AGU, Washington, D.C., 9-13 Dec.
- Lafferty D.C., **Grogan, D.S.**, Zuidema S., Alipour A., Haqiqi I., Sriver R.L., Keller K. 2024. Combined climate and hydrologic uncertainties shape projections of future soil moisture extremes. Abstract H13F-1073 presented at 2024 Fall Meeting, AGU, Washington, D.C., 9-13 Dec.
- Burakowski E., Rhoades A., **Grogan, D.S.**, Zuidema S., Beltran-Peña A.A., Zarzycki C.M., Contosta A. 2024. The future of snow: High resolution snow and climate projections for the contiguous United States. Abstract H32C-02 presented at 2024 Fall Meeting, AGU, Washington, D.C., 9-13 Dec.
- Grogan D.**, Zuidema S., Iavorivska L. Groundwater and society workshop: Transdisciplinary collaborations for sustainable management of an invisible resource. 2024. Presented at the Department of Energy's Earth and Environmental Systems Modeling Program Principle Investigator's meeting, Bethesda, Maryland, August 6 – 9.
- Lafferty D., Sriver R., **Grogan D.**, Zuidema S., Alipour A., Keller K., Haqiqi I. Combined climate and hydrologic uncertainties shape projections of future soil moisture. 2024. Presented at the Department of Energy's Earth and Environmental Systems Modeling Program Principle Investigator's meeting, Bethesda, Maryland, August 6 – 9.
- Valappil F., **Grogan D.**, Daenzer K., Froking S., Calvin K., Nucciarone J., Fisher-Vanden K., Lammers R.B. How does crop production adapt with groundwater restrictions in the West? 2024. Presented at the Department of Energy's Earth and Environmental Systems Modeling Program Principle Investigator's meeting, Bethesda, Maryland, August 6 – 9.
- Zuidema S., **Grogan D.**, Haqiqi I. Testing the conditional skill of a hydro-economics model system for food, land, and water sustainability research. 2024. Presented at the Department of Energy's Earth and Environmental Systems Modeling Program Principle Investigator's meeting, Bethesda, Maryland, August 6 – 9.

- Keesee A.M., Merkin S., **Grogan D.S.**, Venegas G., Ziervogel K., Vilevac S., Hale S. Innovative methods for involving undergraduates in STEM research. 2024. Presented at the Triennial Earth-Sun Summit, Dallas, Texas, April 7 – 12.
- Alipour A., Ye H., Sharma S., Zuidema S., **Grogan D.**, Nicholas R.E., Keller K. Characterizing uncertainty in soil moisture to improve hindcast and projections of crop yields and MultiSector Dynamics. 2023. Presented at the MultiSector Dynamics Workshop, Davis, CA, Oct. 3-5.
- Zuidema S., **Grogan D.**, Haqiqi I., Cisneros-Pineda A., Liu J., Lafferty D., Alipour A. Bifurcating climate stresses of too wet and too dry in America's breadbasket. 2023. Presented at the MultiSector Dynamics Workshop, Davis, CA, Oct. 3-5.
- Lammers, R.B., **Grogan, D.S.**, Lisk, M.D., Zheng, J., Zuidema, S., Fisher-Vanden, K., Olmstead, S.M., Fowler, L., Prusevich, A. Water markets can accelerate groundwater depletion and increase surface water availability. 2022. Abstract TU15 presented at 2022 Chapman Conference on Solving Water Availability Challenges through an Interdisciplinary Framework, AGU, Golden, Colorado, Sept 12-16.
- Woo, J., Zhao, L., **Grogan, D.S.**, Haqiqi, I., Lammers, R.B., Song, C.X. 2022. C<sup>3</sup>F: A collaborative container-based model coupling framework. In *Proceedings of PEARC'22* (Practice and Experience in Advanced Research Computing, 2022). ACM, Boston, MA, USA, 12 pages.
- Zuidema, S., Ziervogel, K., Weidner, E.F., Venegas, G., Varner, R.K., Spence, H.E., Scheick, J., Padilla, A.M., Ollinger, S.V., Munro, L., Moore, G., Miksis-Olds, J.L., Keesee, A.M., Kashi, N., **Grogan, D.S.**, Foster, D.L., Duderstadt, K., Contosta, A., and Burakowski, E. 2022. Developing a pathway toward Justice, Equity, Diversity, and Inclusion (JEDI) through recruitment, collaboration, and research at the Institute for the Study of Earth, Oceans, and Space (EOS) at the University of New Hampshire. Abstract U35A-2241 presented at 2022 Fall Meeting, AGU, Virtual, 13-17 Dec.
- Haqiqi, I., **Grogan, D.S.**, Horeh, M.B., Hertel, T.H., Liu, J., Baldos, L. 2021. A pandemic combined with global heat stress and drought: Impacts on food security and environmental sustainability. The Global Trade Analysis Project (GTAP) conference, held virtually June 23-25, 2021.
- Haqiqi, I., **Grogan, D.S.**, Horeh, M.B., Hertel, T.H., Liu, J., Baldos, L. 2020. Environmental stressors can intensify the impacts of pandemics on Earth's natural resources and global food systems. Abstract GH023-05 presented at 2020 Fall Meeting, AGU, Virtual, 14-18 Dec.
- Burakowski, E.A., Zarzycki, C.M., Rhoades, A., **Grogan, D.S.**, Contosta A. 2019. The future of snow: high resolution snow projections for the continental United States under lower and higher climate forcing. Abstract H22I-2048 presented at 2019 Fall Meeting, AGU, San Francisco, Calif. 9-13 Dec.

- Ciraci, E., Velicogna, I., A, G., Lammers, R.B., **Grogan, D.S.**, Prousevitch, A.A., Yang, Y-C.E. 2019. Water budget of the Indus River Basin between 2002 and 2015. Abstract C51B-1284 presented at 2019 Fall Meeting, AGU, San Francisco, Calif. 9-13 Dec.
- Haqiqi, I., **Grogan, D.S.**, Hertel, T.W., Schlenker, W. 2019. Compound hydro-climatic extremes and agricultural crop yields. Abstract GC43F-1346 presented at 2019 Fall Meeting, AGU, San Francisco, Calif. 9-13 Dec.
- Grogan, D.S.**, Burakowski, E.A., Contosta, A. 2019. A lengthening vernal window: hydrologic impacts of changes in the timing of snow melt and budburst in northeastern North America. Abstract H11P-1740 presented at 2019 Fall Meeting, AGU, San Francisco, Calif. 9-13 Dec.
- Lindsey, E., Burakowski, E., Contosta, A., **Grogan, D.S.**, Sanders-DeMott, R., Campbell, J.L. 2019. Tracking the vernal window using bundled Global Learning and Observations to Benefit the Environment (GLOBE) protocols. Abstract ED21D-1055 presented at 2019 Fall Meeting, AGU, San Francisco, Calif. 9-13 Dec.
- Rougé C., Reed P.M., **Grogan D.S.**, Zuidema S., Prusevich A., Glidden S., Lamontagne J. R., Lammers, R. B. 2018. Reservoirs in hydrological models: Is there a pilot on board? Abstract H24F-08 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.
- Velicogna, I., Ciraci, E., A, G., Lammers, R.B., **Grogan, D.S.**, Prousevitch, A.A., Kapnick, S.B. 2018. Contribution of High Mountain Asia glacier changes to river basin hydrology from GRACE and model output products. Abstract C21E-1387 presented at 2018 Fall Meeting, AGU, Washington, D.C., 10-14 Dec.
- Lammers, R.B., **Grogan, D.S.**, Frohling, S.E., Zuidema, S., Fowler, L., Caccese, R.T., Peklak, D.L., Fisher-Vanden, K. 2017. The Role of Water Governance and Irrigation Technologies in Regional-Scale Water Use and Consumption in the US West. Abstract H11H-1299 presented at 2017 Fall Meeting, AGU, New Orleans, Louisiana, 11-15 Dec.
- Osmanoglu, B., Hock, R., Lammers, R.B., Nicholls, S.D., Montesano, P., Neigh, C.S.R., Frohling, S.E., **Grogan, D.S.**, Rounce, D., Prousevitch, A.A. 2017. Downstream impacts of climate induced glacier change in High Mountain Asia. Abstract C33A-1539 presented at 2017 Fall Meeting, AGU, New Orleans, Louisiana, 11-15 Dec.
- Velicogna, I., A, G., Ciraci, E., **Grogan, D.S.**, Lammers, R.B. 2017. Partitioning of the water budget in the main river basins in High Mountain Asia with GRACE, model output, and other observations. Abstract C41F-04 presented at 2017 Fall Meeting, AGU, New Orleans, Louisiana, 11-15 Dec.
- Grogan, D.S.**, Wisser, D., Prusevich, A., Lammers, R.B., Frohling, S. 2016. Meltwater contributions to irrigation in High Mountain Asia under a changing climate. Abstract H13L-1586 presented at 2016 Fall meeting, AGU, San Francisco, Calif., 12-16 Dec.
- Grogan, D.S.**, Wisser, D., Prusevich, A., Lammers, R.B., Frohling, S. 2015. The use and re-use of unsustainably mined groundwater: A global budget. Abstract H11H-1438 presented at 2015 Fall meeting, AGU, San Francisco, Calif., 14-18 Dec.

- Zaveri, E., **Grogan D.S.**, Fisher-Vanden, K., Frolking, S., Wrenn, D.H. 2015. Adaptability of Irrigation to a Changing Monsoon in India: How far can we go? Presented at: 20th Agricultural Sciences Research Expo, Pennsylvania State University, March 19, 2015 [Awarded 1<sup>st</sup> prize]; Interdisciplinary Ph.D. Workshop in Sustainable Development, Columbia University, April 3-4, 2015; Association of Environmental and Resources Economists (AERE) Annual Conference, June 3-5, 2015; Northeastern Agricultural and Resource Economics Association (NAREA) Annual Conference, June 28-30, 2015; Heartland Environmental and Resource Economics Workshop, University of Illinois at Urbana Campaign, November 1-2, 2015. Also presented at the NSF WSC PI Meeting 9-11 Feb. 2015.
- Grogan, D.S.**, Kim H., Yamazaki D. 2014. Adapting a global flood model for regional simulations: the CaMa-Flood model as applied to New England catchments. Abstract GC11D-0594 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
- Zaveri, E., **Grogan, D.S.**, Fisher-Vanden, K., Frolking, S., Wrenn, D., Nicholas, R. 2014 Adaptability of Irrigation to a Changing Monsoon in India: How far can we go? Abstract GC13G-0746 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec.
- Grogan, D.S.**, Frolking, S., Lammers, R.B., Wisser, D., Prusevich, A., Glidden, S. 2013. The hidden costs of improving irrigation efficiency: a case study from India. Abstract H34F-06 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.
- Grogan, D.S.**, Zhang, F., Glidden, S., Wisser, D., Prusevich, A., Li, C., Lammers, R.B., and Frolking, S. 2012. Quantifying and mapping China's crop yield gains from sustainable and unsustainable irrigation water use. Abstract #5 presented at 2013 Global Water Systems Project Conference, Bonn, Germany, May 21 – 24: Abstract GC21C-0982 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.
- Grogan, D.S.**, Zhang, F., Li, C., Frolking, S. 2011. Spatial modeling of contemporary crop yields in China under sustainable and unsustainable water use scenarios. Presented at 2012 Water for Food Global Conference, Lincoln, NE, May 30 – June 1; Abstract B23B-0413 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.
- Grogan, D.**, Whiteside, J.H., Musher, D., Rosengard, S.Z., van Keuren, M.A., Pancost, R.D. 2010. A terrestrial Eocene stack: tying terrestrial lake ecology to marine carbon cycling through the Early Eocene Climatic Optimum. Abstract B51F-0416 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Pancost, R.D., Handley, L., Taylor, K.W.R., Collinson, M.E., Weijers, J., Talbot, H., Hollis, C., **Grogan, D.**, Whiteside, J.H. 2010. The impact of elevated temperatures on continental carbon cycling in the Paleogene. Abstract B44B-07 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.
- Rosengard, S.Z, **Grogan, D.**, Whiteside, J.H., van Keuren, M.A., Musher, D. 2010. Prevalent carbon cycle dynamics through the early Eocene climatic optimum orbital

couplings to lacustrine cycling. Abstract PP31C-1639 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.

Musher, D., **Grogan, D.**, Whiteside, J.H. 2010. New Insights into Early Cenozoic Carbon Cycling: Continental Ecosystem Response to Orbital Forcing in the Lacustrine Green River Formation (Western US) at the Conclusion of the Early Eocene Climatic Optimum. Abstract PP23B-1755 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.

**Grogan, D.**, Whiteside, J.H., Trewin, N., Johnson, J. 2009. Linking fossil fish cyclicity and paleoenvironmental proxies in the mid-Devonian. Eos Transactions, American Geophysical Union, Supplement, v. 90 (52), Abstract PP31B-1308.

**Grogan, D.**, Newton, R. 2009. Impact of storm drain runoff on water quality in the Mill River, Northampton MA. Geological Society of American Northeast Section Conference, Portland ME.