CURRICULUM VITAE

HOWARD E. EPSTEIN **Born:** October 23, 1964
Department of Environmental Sciences
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University of Virginia
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Academic Training:

Degree	*Year*	*Institution*	*Major*
B.A.	1986	Cornell University	Computer Science
M.S.	1995	Colorado State University	Rangeland Ecosystem Science
Ph.D.	1997	Colorado State University	Ecology

Professional Experience:

2019-present *Department Chair,* Department of Environmental Sciences, University of Virginia, Charlottesville, VA

2010-present *Full Professor*, Department of Environmental Sciences, University of Virginia, Charlottesville, VA

2004-2010 *Associate Professor*, Department of Environmental Sciences, University of Virginia, Charlottesville, VA

1998-2004 *Assistant Professor*, Department of Environmental Sciences, University of Virginia, Charlottesville, VA

1997-1998 *Post-Doctoral Research Associate*, Institute of Arctic and Alpine Research, University of Colorado, Boulder, Colorado.

1992-1997 *Graduate Research Assistant*, Departments of Rangeland Ecosystem Science and Forest Science, Colorado State University, Fort Collins, Colorado.

1991-1992 *Information Systems Consultant*, self-employed, Denver, Colorado.

1986-1991 *Information Systems Consultant*, Andersen Consulting, Denver, Colorado and New York, New York.

Professional Societies:

American Association for the Advancement of Science
American Geophysical Union
Arctic Research Consortium of the United States
Ecological Society of America
Sigma Xi
Union of Concerned Scientists
U.S. Permafrost Association

Grants and Awards:

Climate science: Bridging global and community scales, 2022-2027, **UVA Prominence to Preeminence**, (Co-PI, McGlathery), **$3,800,000**

LRGV NWR Remote sensing of invasive species, 2021-2022. Subaward from the **University of Texas Rio Grande Valley** (Co-PI with Yang) **$92,966**.

Permafrost, thermokarst, and vegetation dynamics: mapping the availability of terrestrial lichen and other forage plants, 2020-2023, **Polar Knowledge Canada** (Collaborating Scientist – Jennifer Balzer) Wilfrid Laurier University, Waterloo, Ontario, Canada

NNA Track 1: Understanding the Changing Natural-Built Landscape in an Arctic Community: An Integrated Sensor Network in Utqiaġvik, Alaska, 2021-2025, **NSF Navigating the New Arctic**, (PI) **$3,000,000**

Collaborative Research: Environmental and biological controls on carbon uptake phenology in permafrost affected boreal forests, 2020-2023, **NSF Office of Polar Programs**, (Co-PI with Yang, Watts – Woodwell Climate Research Center), **$476,284**

Assessing the ability to detect invasive plant species using drone-based leaf-scale visible and near-infrared imaging spectroscopy, 2020-2022, **Virginia Space Grant Consortium** (Faculty Advisor with Kelsey Huelsman), **$12,000**

Land use as a modulator of land cover transitions and the ecosystem–atmosphere carbon balance (LANDMOD), 2020-2024, **Academy of Finland** (Collaborating Scientist – Timo Kumpula) University of Eastern Finland, Joensuu, Finland

Essential Biodiversity Variables – Scale Up: Harnessing the power of GEE and GEO BON to bring EBVs from concept to application-ready global solutions in the service of society, 2020-2022, **Group on Earth Observations–Google Earth Engine**, (Collaborating Scientist), University of Florida, and German Centre for Integrative Biodiversity Research

UVA-SWO Partnership for Rangeland Ecology Research and Education, 2020-2021, **Community Based Undergraduate Research Grant (CBURG)**, (Faculty Advisor) University of Virginia, **$10,000**

Drivers and Feedbacks of Changing Arctic Terrestrial Biodiversity (CHARTER), 2020-2023, **European Union H2020 Cryosphere**, (Collaborating Scientist – Bruce Forbes) University of Lapland, Rovaniemi, Finland.

Arctic Environmental Data Narratives (AEDN): Understanding interactions among the natural, built, and human environment through an integrated sensor network, 2020-2022, **UVA Center for Global Inquiry and Innovation** (CoPI with Jull, Cho, Burtner, Wylie) **$107,199**

Vulnerability of the taiga-tundra ecotone: Predicting the magnitude, variability, and rate of change at the intersection of arctic and boreal ecosystems, 2019-2022, **NASA Arctic Boreal Vulnerability Experiment (ABoVE)** (Subaward from USRA) **$101,152**.

Assessing ecosystem function based on satellite observation of vegetation quantitative parameters retrieved in high spatial and temporal resolution, 2019-2022, **INTER-ACTION Czech Republic** (Collaborator with Jana Albrechtova, Charles University, Prague, Czech Republic)

Using drone-based hyperspectral imagery to map individual species of invasive plants in the northern Blue Ridge Mountains of Virginia, 2018-2020, **USDA NRCS** (PI) **$75,000**

Advanced geospatial techniques in archaeological teaching and research: the Kotroni Archaeological Survey Project at Kapandriti, Greece, 2018-2020, 4-VA at University of Virginia (Collaborator with Dakouri-Hild) **$25,000**

UVA-Oyate partnership for rangeland ecology research and education, 2018-2022. **Jefferson Trust** (Co-PI with Eisenfelder/Wong – undergraduate students) **$63,900**

Convergence NNA: Bridging science, art, and community in the new Arctic, 2018-2021. **NSF Science, Technology, and Society** (Co-PI with Jull, Cho, Burtner) **$100,000**

Promoting resilience of arctic cities and landscapes. 2018-2021. **UVA Environmental Resilience Institute CoLab** (Co-PI with Jull, Cho, Heydarian, Burtner) **$171,020**.

Ecosystem functional diversity of the circumpolar Arctic tundra. 2018-2022. **NASA GEO-BON Work Programme, Biodiversity and Applied Science** (PI) **$606,666**

Collaborative Research: Patterns, dynamics, and vulnerability of Arctic polygonal ecosystems: From ice-wedge polygons to pan-Arctic landscapes. 2018-2021. **National Science Foundation** – Arctic System Sciences (PI) **$246,704**.

Collaborative Research: Forest water use and the influence of acid deposition. 2016-2021. **National Science Foundation** – Division of Earth Sciences, Hydrologic Sciences (Co-PI with Scanlon) **$269,674.**

Socio-ecological functional types: Integrating biophysical and social processes to characterize ecosystems of the Anthropocene. 2016-2018. University of Granada, **Ministry of Economy and Competition, Spain** (Collaborating Scientist).

Collaborative Research: Understanding the potential for a climate-change driven critical transition from forest to chaparral. 2014-2018. **National Science Foundation**, Division of Environmental Biology, Ecosystem Studies (PI) **$98,501.**

Yamal synthesis: Synthesis of remote-sensing studies, ground observations, and modeling to understand socio-ecological consequences of climate change and resource development on the Yamal Peninsula, Russia and relevance to the circumpolar Arctic. 2014-2018. **National Aeronautic and Space Administration**, Land Cover Land Use Change (PI – Subaward from University of Alaska Fairbanks) **$99,875.**

International training on regional ecosystem-climate interactions. 2014-2015. **Asia-Pacific Network for Global Change Research** (Collaborating Scientist) **$45,000**.

A unified simulator for temperate and boreal forests of the northern hemisphere: A tool for research, policy and economic issues. 2014. Program of Distinction, Vice Provost for Global Affairs, **University of Virginia** (Co-PI with Shugart), **$100,000.**

Recovery and archiving of key Arctic Alaska vegetation map and plot data for long-term vegetation analyses. 2013-2015. **National Aeronautic and Space Administration**, Terrestrial Ecosystems, (PI – Subaward from University of Alaska Fairbanks) **$24,926.**

Bridging ecosystem services and territorial planning (BEST-P): A southern South American initiative. **Inter-American Institute** (Collaborating Scientist) 2013-2017.

Tibetan Plateau Conference, Center for International Studies, 2014. **University of Virginia** (PI) **$6,000**.

Carbon cycling in old-growth ecosystems of the Mid-Atlantic. 2011-2013. **Smithsonian Conservation Biology Institute**. (PI) **$47,958**.

Collaborative Research: Investigating the relationships between changing seasonality of marine shelf ice/ocean conditions and tundra vegetation, and their effects on energy and carbon budgets. 2009-2013. **National Science Foundation**, Office of Polar Programs, Arctic System Sciences, (PI) **$358,777**.

Carbon and water cycling across ecohydrological gradients in a West Virginia watershed. 2009-2011. **Canaan Valley Institute**. (PI) **$70,000.**

Adaptation to rapid land-use and climate changes on the Yamal Peninsula, Russia: Remote sensing and models for analyzing cumulative effects. 2009-2011. **NASA Northern Eurasia Earth Science Partnership Initiative**. (PI – Subaward from the University of Alaska Fairbanks) **$85,000**.

Effects of global change on ecosystem functioning in the Spanish National Parks Network: recent impacts and development of a monitoring system. 2008-2010. **Autonomous Organ of National Parks, Ministry of Environment, Spain** (Co-PI).

Modeling transpiration and plant water stress from leaf-level to catchment-scale. 2007-2008. **National Science Foundation**, Division of Earth Sciences, Hydrology Section (PI) **$50,372**.

International Research Experience for Students – Impacts of disturbance on above- and below-ground structure of southern African savannas. 2006-2009. **National Science Foundation**, Office of International Science and Engineering (Co-PI with Swap) **$149,912**.

Application of space-based technologies and models to address land cover / land use change problems on the Yamal Peninsula, Russia 2006-2009. **NASA/USDA Northern Eurasia Earth Science Partnership Initiative**. (PI – Subaward from the University of Alaska Fairbanks) **$182,859**.

Land use change in the Rio de la Plata Basin: Linking biophysical and human factors to predict trends, assess impacts, and support viable land-use strategies for the future. 2006-2011. **Inter-American Institute**. (Collaborating Scientist).

Collaborative research: Greening of the Arctic – Synthesis of models to examine the effects of climate, sea-ice, and terrain on circumpolar vegetation change. 2005-2008. **National Science Foundation**, Office of Polar Programs, Arctic System Sciences. (PI) **$405,069**.

Collaborative research: Watershed carbon distribution and flux across environmental gradients. 2004-2008. **National Science Foundation**, Division of Earth Sciences, Integrated Carbon Cycle Science. (PI) **$151,836**.

Collaborative research: The role of wind erosion in ecosystem change in desert grasslands. 2003-2006. **National Science Foundation**, Division of Environmental Biology, Ecosystems Studies. (Co-PI with Okin) **$479,165**.

REU Supplement for Collaborative research: The role of wind erosion in ecosystem change in desert grasslands. 2006. **National Science Foundation**, Division of Environmental Biology, Ecosystems Studies. (Co-PI with Okin) **$6,000**.

Collaborative research: Impact of stochastic soil moisture dynamics on vegetation water stress and nutrient cycling. 2003-2006. **National Science Foundation**, Division of Earth Sciences, Hydrologic Sciences. (Co-PI with D'Odorico) **$65,072**.

Biocomplexity associated with biogeochemical cycles in arctic frost-boil ecosystems. 2002-2007. **National Science Foundation**, Biocomplexity in the Environment. (PI) Subcontract from the University of Alaska Fairbanks **$338,700**.

REU Supplement: Buried seed and succession of arctic frost-ecosystems along a high-latitude temperature gradient. 2005. **National Science Foundation**. Biocomplexity in the Environment (PI) Subcontract from the University of Alaska Fairbanks **$7,200**.

Resolving the scale-wise sensitivities in the dynamical coupling between climate and the biosphere. 2001-2003. **University of Virginia**, Funding for Excellence in Science and Technology (PI) **$214,699**.

Arctic vegetation: Climate-substrate interactions. 1999-2003. **National Science Foundation**, Office of Polar Programs, Arctic System Science, Land-Atmosphere-Ice Interactions. (PI) Subcontract from the University of Alaska Fairbanks **$291,362**.

GIS Training. 2001-2005. **Virginia Department of Mineral Resources** (PI) **$61,150**.

REU Site Proposal for Environmental Biology Studies at Blandy Experimental Farm - UVA. 2012-2017. **National Science Foundation,** Biological Infrastructure (Collaborating Scientist) **$502,987**.

REU Site Proposal for Environmental Biology Studies at Blandy Experimental Farm - UVA. 2008-2011. **National Science Foundation,** Biological Infrastructure (Collaborating Scientist) **$334,188**.

REU Site Proposal for Environmental Biology Studies at Blandy Experimental Farm - UVA. 2005-2007. **National Science Foundation,** Biological Infrastructure (Collaborating Scientist) **$226,157**.

REU Site Proposal for Environmental Biology Studies at the Blandy Experimental Farm. 2002-2004. **National Science Foundation,** Biological Infrastructure (Collaborating Scientist) **$184,350**.

Journal Articles (176 total): [****Undergraduate, graduate, or postdoctoral advisee; *Graduate or postdoctoral collaborator*]

Heijmans, M., R. Magnusson, M. Lara, G. Frost, I. Myers-Smith, J. van Huissteden, M. Jorgenson, A. Fedorov, H. Epstein, D. Lawrence, and J. Limpens. 2022. Tundra vegetation change and impacts on permafrost. **Nature Reviews Earth and Environment** 3:68-84.

Jorgenson, M.T., M.Z. Kanevskiy, J.C. Jorgenson, A. Liljedahl, H. Epstein, K. Kent, C.G. Griffin, R. Daanen, M. Boldenow, K. Orndahl, and B.M. Jones. Rapid transformation of tundra ecosystems from ice-wedge degradation. **Global and Planetary Change** in press.

Nelson, P.R., A.J. Maguire, Z. Pierrat, E.L. Orcutt, D. Yang, S. Serbin, G.V. Frost, M.J. Macander, T.S. Magney, D.R. Thompson, J.A. Wang, S.F. Oberbauer, S. Vargas Zesati, S.J. Davidson, H.E. Epstein, S. Unger, P.K.E. Campbell, N. Carmon, M. Velez-Reyes, and K.F. Huemmrich. Remote sensing of tundra ecosystems using high spectral resolution reflectance: Opportunities and challenges. **Journal of Geophysical Research – Biogeosciences** in press.

Bhatt, U.S., D.A. Walker, M.K. Raynolds, J.E. Walsh, P.A. Bieniek, L. Cai, J.C. Comiso, H.E. Epstein, G.V. Frost, R. Gersten, A.S. Hendricks, J.E. Pinzon, L. Stock, and C.J. Tucker. 2021. Climate drivers of arctic tundra variability and changes using an indicators framework. **Environmental Research Letters** 16(5):055019.

Cheng, X., P. Tain, L. Zuzheng, W. Tian, H. Hairong, and H. Epstein. 2021. Effects of environmental factors on plant functional traits across different plant life forms in a temperate forest ecosystem. **Forests** doi: 10.1007/s11056-021-09847-0.

Cheng, X, H. Han, J. Zhu, X. Peng, B. Li, H. Liu, and H.E. Epstein. 2021. Forest thinning and organic matter manipulation drives changes in soil respiration in a *Larix principis-rupprechtii* plantation in China. **Soil & Tillage Research** 211 104996.

Cinoglu, D., H.E. Epstein, A.J. Tepley, K.J. Anderson-Teixeira, J.R. Thompson, and S.S. Perakis. 2021. Climatic aridity shapes post-fore interactions between *Ceanothus spp*. And Doulgas fir (*Pseudotsuga menziesii*) across the Klamath Mountains. **Forests 12:1567.

Epstein, H.E., D.A. Walker, G.V. Frost, M.K. Raynolds, U. Bhatt, R. Daanen, B.C. Forbes, J. Geml, E. Kaarlejärvi, O. Khitun, A. Khmoutov, P. Kuss, M. Leibman, G. Matyshak, N. Moskalenko, P. Orekhov, V. Romanovsky, and I. Timling. 2021. Spatial patterns of arctic tundra vegetation properties on different soils along the Eurasian Arctic Transect, and insights for a changing Arctic. **Environmental Research Letters** 16:014008.

Frost, G. V., M. J. Macander, U. S. Bhatt, L. T. Berner, J. W. Bjerke, H. E. Epstein, B. C. Forbes, S. J. Goetz, M. J. Lara, T. Park, G. K. Phoenix, S. P. Serbin, H. Tømmervik, D. A. Walker, and D. Yang, 2021a: Tundra greenness. **Arctic Report Card 2021**, T. A. Moon, M. L. Druckenmiller, and R. L. Thoman, Eds., https://doi.org/10.25923/8n78-wp73.

Frost, G. V., M. J. Macander, U. S. Bhatt, H. E. Epstein, L. T. Berner, J. W. Bjerke, B. C. Forbes, S. J. Goetz, M. J. Lara, T. Park, G. K. Phoenix, M. K. Raynolds, H. Tømmervik, and D. A. Walker. 2021. Tundra greenness [in "State of the Climate in 2020"]. **Bulletin of the American Meteorological Society** 102:S297–S299. DOI:10.1175/BAMS-D-21-0086.1.

*Hey, M.H., H.E. Epstein, and K.J. Haynes. Artificial light at night impacts the litter layer invertebrate community with no cascading effects on litter breakdown. 2021. **Frontiers Ecology and Evolution** 9: 748983

*Kropp, H., M.M. Loranty, S.M. Natali, A.L. Kholodov, A.V. Rocha, I.H. Myers-Smith, B.W. Abbott, J. Ackermann, E. Blanc-Betes, D. Blok, G. Blume-Werry, J. Boike, A.L. Breen, S.M.P. Cahoon, C.T. Christiansen, T.A. Douglas, H.E. Epstein, G.V. Frost, M. Goeckede, T.T. Høye, S.D. Mamet, J.A. O'Donnell, D. Olefeldt, G.K. Phoenix, V.G. Salmon, A.B.K. Sannel, S.L. Smith, O. Sonnentag, L. Vaughn, M. Williams, B. Elberling, L. Gough, J. Hjort, P.M. Lafleur, E.S. Euskirchen, M. Heijmans, E.R. Humphreys, H. Iwata, B.M. Jones, T. Jorgenson, I. Grünberg, Y. Kim, J. Laundre, M. Mauritz, A.

Michelsen, G. Schaepman-Strub, K.D. Tape, M. Ueyama, B.-Y. Lee, K. Langley, and M. Lund. 2021. Shallow soils are warmer under trees and tall shrubs across Arctic and Boreal ecosystems. **Environmental Research Letters** 16:015001.

*Tai, X., H.E. Epstein, and B. Li. Effects of grazing exclusion on spring and autumn pastures in arid regions of China: Insights from field surveys and landsat images. 2021. **Agriculture, Ecosystems and Environment** doi.org/10.1016/j.agee.2021.107302.

Witharana, C., M.A.E. Bhuiyan, A. Liljedahl, M. Kanevskiy, T. Jorgenson, B. Jones, R. Daanen, H. Epstein, C. Griffin, K. Kent, and M. Ward Jones. An object-based approach for mapping tundra ice-wedge polygon troughs from very high spatial resolution optical satellite imagery. 2021. **Remote Sensing** 13(4):558.

*Wu, W., H.E. Epstein, H. Guo, X. Li, and C. Gong. 2021. A pigment ratio index based on remotely sensed reflectance provides the potential for universal gross primary production estimation. **Environmental Research Letters** ERL-110614.R2

Beamish, A., M.K. Raynolds, H. Epstein, G.V. Frost, M.J. Macander, H. Bergstedt, A. Bartsch, S. Kruse, V. Miles, C.M. Tanis, B. Heim, M. Fuchs, S. Chabrillat, I. Shevtsova, M. Verdonen, and J. Wagner. 2020. Recent trends and remaining challenges for optical remote sensing of Arctic tundra vegetation: A review and outlook. **Remote Sensing of the Environment** 246:111872.

*Buiyan, M.A.E., C. Witharana, A.K. Liljedahl, B.M. Jones, R. Daanen, H.E. Epstein. K. Kent, C.G. Griffin, and A. Agnew. 2020. Understanding the effects of optimal combination of spectral bands on deep learning model predictions: a case study based on permafrost tundra landform mapping using high resolution multispectral satellite imagery. **Journal of Imaging** 6:97.

Cho, L. M. Burtner, H. Epstein, C. Griffin, and M. Jull. 2020. Bridging science, art, and community in the new Arctic. **The Polar Journal** doi: 10.1080/2154896X.2020.1776472

Frost, G.V., U.S. Bhatt, H.E. Epstein, L.T. Berner, J.W. Bjerke, B.C. Forbes, S.J. Goetz, M.J. Lara, M.J. Macander, G.K. Phoenix, M.K. Raynolds, H. Tømmervik, and D.A. Walker. 2020. Tundra greenness [in "State of the Climate in 2019"]. **Bulletin of the America Meteorological Society** 101 (8), S272–S274, https://doi.org/10.1175/BAMS-D-20-0086.1.

Frost, G. V., U. S. Bhatt, H. E. Epstein, I. Myers-Smith, G. K. Phoenix, L. T. Berner, J. W. Bjerke, B. C. Forbes, M. J. Macander, S. J. Goetz, J. T. Kerby, T. Park, M. K. Raynolds, H. Tømmervik, and D. A. Walker. 2020. Tundra greenness. ***NOAA Arctic Report Card 2020***, J. Richter-Menge, M. L. Druckenmiller, and M. Jeffries (Eds.). DOI:10.25923/46rm-0w23 <https://arctic.noaa.gov/report-card/report-card-2020>

Goncharova, O.Y., G.V. Matyshak, M. Udovenko, O. Semenyuk, and H.E. Epstein. 2020. Temporal dynamics, drivers, and components of soil respiration in urban forest ecosystems. **Catena** 185:104299.

Malcomb, J.D., T.M. Scanlon, H.E. Epstein, D.L. Druckenbrod, M.A. Vadeboncoeur, M. Lanning, M.B. Adams, and L.X. Wang. 2020. Assessing temperate forest growth and climate sensitivity in response to a long-term whole-watershed acidification experiment. **Journal of Geophysical Research – Biogeosciences 125:e2019JG005560.

Myers-Smith, I.H., J.T. Kerby, G.K. Phoenix, J.W. Bjerke, H.E. Epstein, J.J. Assmann, C. John, L. Andreu-Hayles, S. Angers-Blondin, P.S.A. Beck, L.T. Berner, U.S. Bhatt, A.D. Bjorkman, D. Blok, A. Bryn, C.T. Christiansen, J.H.C. Cornelissen, A.M. Cunliffe, S.C. Elmendorf, B.C. Forbes, S.J. Goetz, R.D Hollister, R. de Jong, M.M. Loranty, M. Macias-Fauria, K. Maseyk, S. Normand, J. Olofsson, T.C. Parker, F.-J.W. Parmentier, E. Post, G. Schaepman-Strub, F. Stordal, P.F. Sullivan, H.J.D. Thomas, H. Tømmervik, R. Treharne, C.E. Tweedie, D.A. Walker, M. Wilmking, and S. Wipf. 2020. Complexity revealed in the greening of the Arctic. **Nature Climate Change** 10:106-117.

*Tai, X.L., H.E. Epstein, and B. Li. 2020. Elevation and climate effects on vegetation greenness in a mountain-basin system of Central Asia. **Remote Sensing** 12:1665.

Wang, H., G. Jia, H.E. Epstein, H. Zhao, and A. Zhang. 2020. Integrating a PhenoCam-derived vegetation index into a light use efficiency model to estimate gross primary production in a semi-arid grassland. **Agriculture and Forest Meteorology** 107983.

Witharana, C., M.A.E. Bhuiyan, A.K. Liljedahl, M. Kanevskiy, H.E. Epstein, B.M. Jones, R. Daanen, C.G. Griffin, K. Kent, and M. Ward Jones. 2020. Understanding the synergies of deep learning and data fusion of multispectral and panchromatic high resolution commercial satellite imagery for automated ice-wedge polygon detection. **ISPRS Journal of Photogrammetry and Remote Sensing** 170:174-191.

*Wu, W., X. Sun, H. Epstein, X. Xu, and X. Li. 2020. Spatial heterogeneity of climate variation and vegetation response for Arctic and high-elevation regions from 2001-2018. **Environmental Research Communications** 2 011007.

Yuan, Zi-Q., H. Epstein, and G-Y. Li. 2020. Grazing exclusion did not affect soil properties in alpine meadows in the Tibetan permafrost region. **Ecological Engineering** 147:105657.

*Zhang, W.X., A.K. Liljedahl, M. Kanevskiy, H.E. Epstein, B.M. Jones, M.T. Jorgenson, and K. Kent. 2020. Transferability of the deep learning mask R-CNN model for automated mapping of ice-wedge polygons in high-resolution satellite and UAV imagery. **Remote Sensing** 12:10.3390/rs12071085.

Epstein, H.E., U.S. Bhatt, M.K. Raynolds, D.A. Walker, B.C. Forbes, G. Phoenix, J. Bjerke, H. Tømmervik, S.-R. Karlsen, R. Myneni, T. Park, S. Goetz, and G. Jia. 2019. Tundra greenness [in "State of the Climate in 2018"]. **Bulletin of the America Meteorological Society** 100:S1-+.

*Lanning, M., L.X. Wang, T.M. Scanlon, M.A. Vadeboncoeur, M.B. Adams, H.E. Epstein, and D. Druckenbrod. 2019. Intensified vegetation water use under acid deposition. **Science Advances** 5:eaav5168.

Goncharova, O.Y., G.V. Matyshak, H.E. Epstein, A.R. Sefilian, and A.A. Bobrik. 2019. Influence of snow cover on soil temperature: Meso- and micro-scale topographic effects (a case study from the northern West Siberia discontinuous permafrost zone). **Catena** 183:104224.

Walker, D.A., H.E. Epstein, J. Šibík, U. Bhatt, V.E. Romanovsky, A.L. Breen, S. Chasnikova, R. Daanen, L.A. Druckenmiller, K. Ermokhina, B.C. Forbes, G.V. Frost, J. Geml, E. Kaärlejarvi, O. Khitun, A. Khomutov, T. Kumpula, P. Kuss, G. Matyshak, N. Moskalenko, P. Orekhov, J. Peirce, M.K. Raynolds, and I. Timling. 2019. Vegetation on mesic loamy and sandy soils along a 1700-km maritime Eurasia Arctic Transect. **Applied Vegetation Science** 22:150-167.

*Ai, J., G. Jia, H.E. Epstein, H. Wang, A. Zhang, and Y. Hu. 2018. MODIS-based estimates of global terrestrial ecosystem respiration. **Journal of Geophysical Research – Biogeosciences** 123:326-352, doi:10.1002/2017JG004107

Atkins, J.W., H.E. Epstein, and D.L. Welsch. 2018. Using Landsat imagery to map understory shrub expansion relative to landscape position in a mid-Appalachian watershed. **Ecosphere 9:e02404.

Epstein, H., U. Bhatt, M.K. Raynolds, D.A. Walker, J. Pinzon, C.J. Tucker, B.C. Forbes, T. Horstkotte, M. Macias-Fauria, A. Martin, G. Phoenix, J. Bjerke, H. Tømmervik, P. Fauchald, H. Vickers, R. Myneni, T. Park, and C. Dickerson. 2018. Tundra greenness [in "State of the Climate in 2017"]. **Bulletin of the America Meteorological Society** 99 (8), S165–S169, doi:10.1175 /2018BAMSStateoftheClimate.1.

Frost, G.V., H.E. Epstein, D.A. Walker, G. Matyshak, and K. Ermokhina. 2018. Seasonal and long-term changes in active-layer temperatures after tall shrubland expansion and succession in arctic tundra. **Ecosystems 21:507-520.

Loranty, M.M., B.W. Abbott, D. Blok, T.A. Douglas, H.E. Epstein, B.C. Forbes, B.M. Jones, A.L. Kholodov, H. Kropp, A. Malhotra, S.D. Mamet, I.H. Myers-Smith, S.M. Natali, J.A. O'Donnell, G.K. Phoenix, A.V. Rocha, O. Sonnentag, K.D. Tape, and D.A. Walker. 2018. Reviews and syntheses: Changing ecosystem influences on soil thermal regimes in northern high-latitude permafrost regions. **Biogeosciences** 15:5287-5313.

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University of Alaska Fairbanks, Institute of Arctic Biology, September 1998.
International Geosphere Biosphere Programme, High Latitude Transect Workshop, May 2000.
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Appalachian Environmental Laboratory, University of Maryland, March 2005.
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University of Virginia, Alumni Reunions, June 2006
Beijing Normal University, Beijing, China, November 2006
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University of Virginia, Brown College Climate Change Series, March 2008
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Vanderbilt University, Department of Civil and Environmental Engineering, April 2009
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Chinese Academy of Sciences, Institute of Atmospheric Physics, Beijing, China, August 2010
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Oak Ridge National Laboratory, Oak Ridge, TN, March 2011

Chinese Academy of Sciences, Graduate University, Beijing, China, May 2011
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Queen's University, Kingston, Ontario, February 2012
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Bieniek, P.A., U.S. Bhatt, D.A. Walker, M.K. Raynolds, J.C. Comiso, H.E. Epstein, R.Gens, J. Pinzon, C.J. Tucker, M. Steele, and C. Ozimek. Alaska tundra vegetation trends and their links to the large-scale climate. American Geophysical Union Meetings, San Francisco, CA, December 2010.

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Epstein, H.E., Q. Yu, G.V. Frost, M.K. Raynolds, D.A. Walker, and B.C. Forbes. Effects of climate, grazing, and gas development on tundra ecosystems of the Yamal Peninsula, northwestern Siberia. NASA Land Cover Land Use Change Meeting, Adelphi, MD, March 2011.

Riveros-Iregui, D., B. McGlynn, R. Emanuel, and H. Epstein. Spatial and Temporal Variability and Non-Monotonic Responses of Landscape-Scale Soil CO_2 Efflux. European Geophysical Union Meeting, Vienna, Austria, April 2011.

Vaness, B.M., P. Convey, H.E. Epstein, R. Aerts, S. Bokhorst, A. Huiskes, A.M. Kelley. Integrating Plant Root Simulator (PRS™)-Probe soil sampling and conventional soil tests to examine Arctic and Antarctic plant ecosystem responses to nitrogen addition and warming. Ecological Society of America Meetings, Austin, TX, August 2011.

Walker, D.A., Kuss, H.P., Kopecky, M., Frost, G.V., Daniels, F.J.A., Kade, A.N., Vonlanthen, C.M., Raynolds, M.K., Epstein, H.E. The North American and Eurasia Arctic transects: Using phytosociology and remote sensing to detect vegetation pattern and change. European Vegetation Survey 20th Workshop Rome, Italy April 2011.

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McGlynn, B.L., D.A. Riveros-Irequi, R.E. Emanuel, and H.E. Epstein. Organization and scaling of carbon dynamics in complex landscapes: Implications of water, life, and landform feedbacks for terrestrial carbon cycling. American Geophysical Union Meeting, San Francisco, CA, December 2011.

Atkins, J.W., H.E. Epstein, and D.L. Welsch. Mechanisms influencing surface soil CO_2 efflux in respect to elevation and vegetation gradients in a complex watershed. American Geophysical Union Meeting, San Francisco,

CA, December 2011.

Dunker, S.L. and H.E. Epstein. Micrometeorological and edaphic controls on soil CO_2 efflux during secondary succession in Virginia old-fields. American Geophysical Union Meeting, San Francisco, CA, December 2011.

Yu, Q., H.E. Epstein, D.A. Walker, B.C. Forbes, and L.S. Vors. Modeling dynamics of circum-arctic tundra plant communities in response to climate warming and grazing pressure. American Geophysical Union Meeting, San Francisco, CA, December 2011.

Frost, G.V., H.E. Epstein, D.A. Walker, G. Matyshak, and K. Ermokhina. Tall shrub expansion facilitated by patterned ground in the northwest Siberian Low Arctic. American Geophysical Union Meeting, San Francisco, CA, December 2011.

Walker, D.A., H.E. Epstein, M.K. Raynolds, U.S. Bhatt, and P.A. Bieniek. Satellite and ground-based observations of patterns and seasonality of sea-ice, summer warmth, snow, and NDVI along the North America and Eurasia Arctic transects. American Geophysical Union Meeting, San Francisco, CA, December 2011.

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Erler, A., H.E. Epstein, and J. Frazier. Stochastic daily modeling of arctic tundra ecosystems. American Geophysical Union Meeting, San Francisco, CA, December 2011.

Bhatt, U.S., D.A. Walker, P. Bieniek, M. Raynolds, H. Epstein, J. Comiso, J. Pinzon, and C.J. Tucker. Drivers of recent pan-Arctic tundra vegetation variability and change. International Polar Year Conference, Montreal, CA 2012.

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Armstrong, A.H., P. Montesano, B. Osmanoglu, H.E. Epstein, K. Ranson, E. Heffernan, A. Creighton, H.H. Shugart, and B. Gay. Understanding the drivers of variability in forest structure and composition in North American Boreal Forest. American Geophysical Union Meeting, December 2020

Bergman, Z., and H.E. Epstein. Effects of the invasive shrub *Rhamnus davurica* on secondary succession in central Virginia. American Geophysical Union Meeting, December 2020

Creighton, A., B.M. Rogers, B. Osmanoglu, P.M. Montesano, H.E. Epstein, K. Ranson, H.H. Shugart, S.J. Goetz, M. Michaelian, T. Hogg, and A.H. Armstrong. Using individual-based modeling to understand future climate impacts on Canadian aspen parklands. American Geophysical Union Meeting, December 2020

Epstein, H.E., M. Burtner, L. Cho, C.G. Griffin, and M.G. Jull. Bridging science, art, and community in the new Arctic. American Geophysical Union Meeting, December 2020

Epstein, H.E., A. Parisien, K.S. Huelsman, and Z. Bergman. Twenty years of ecosystem research on temperate forest succession at the Blandy Experimental Farm in northwestern Virginia. American Geophysical Union Meeting, December 2020

Gay, B., A.H. Armstrong, P.M. Montesano, B. Osmanoglu, K. Ranson, and H.E. Epstein. Examination of current and future permafrost dynamics across the North American taiga-tundra transition. American Geophysical Union Meeting, December 2020

Griffin, C. M. Burtner, L. Cho. H.E. Epstein, M.G. Jull, and C.D. Wylie. Arctic environmental data narratives: Developing an interdisciplinary, co-productive approach for environmental data analysis and application. American Geophysical Union Meeting, December 2020

Griffin, C., R.P. Daanen, H.E. Epstein, T. Jorgenson, M.Z. Kanevskiy, K. Kent, and A.K. Liljedahl. Landscape connectivity and dissolved organic matter in a degrading permafrost polygonal landscape. American Geophysical Union Meeting, December 2020

Heffernan, E., A.H. Armstrong, H.E. Epstein, P. Montesano, B. Osmanoglu, H.H. Shugart, and K. Ranson. Integrating tall shrubs into an individual-based boreal forest gap model to capture vegetation dynamics at the tundra-taiga ecotone. American Geophysical Union Meeting, December 2020

Huelsman, K.S., H.E. Epstein, X. Yang, and R. Walker. Assessing the ability to detect invasive plant species using drone-based leaf-scale visible and near-infrared imaging spectroscopy. American Geophysical Union Meeting, December 2020

Kent, K. H.E. Epstein, C.G. Griffin, A.K. Liljedahl, T. Jorgenson, R.P. Daanen, and M. Kanevskiy. Soil characteristics and plant functional groups across successional stages of ice-wedge degradation and re-stabilization in the tundra of North America. American Geophysical Union Meeting, December 2020

Liu, L., J.R. Smith, A.H. Armstrong, D. Alcaraz, H.E. Epstein, and R. Chaplin-Kramer. Using satellite based ecosystem functional types to map biodiversity patterns and improve ecosystem service models. American Geophysical Union Meeting, December 2020

Malcomb, J., T.M. Scanlon, H.E. Epstein, M.A. Vadeboncoeur, D. Druckenbrod, M. Lanning, and L. Wang. Soil nutrient controls on water use efficiency in temperate forests: a regional and methodological comparison. American Geophysical Union Meeting, December 2020

Montefiori, E., D. Alcaraz-Segura, P. Magaña, A.H. Armstrong, and H.E Epstein. Assessment of Arctic protected areas to represent tundra ecosystem functional diversity. American Geophysical Union Meeting, December 2020

Parisien, A., K.S. Huelsman, and H.E. Epstein. Changes in foliar nutrient content throughout secondary succession in a Mid-Atlantic temperate forest ecosystem. American Geophysical Union Meeting, December 2020

Tassone, M. and H.E. Epstein. Drivers of spatial and temporal variability in vegetation productivity on the Yamal Peninsula, Siberia, Russia. American Geophysical Union Meeting, December 2020

Witharana, C., M.A.E. Bhuiyan, A.K. Liljedahl, M.Z. Kanevskiy, T. Jorgenson, B.M. Jones, R.P. Daanen, H.E. Epstein, C.G. Griffin, K. Kent, and M.K. Ward Jones. Automated mapping of ice-wedge polygon troughs in the continuous permafrost zone using commercial satellite imagery. American Geophysical Union Meeting, December 2020

Gay, B., A. Armstrong, P. Montesano, K. Ranson, and H. Epstein. Examination of current and future permafrost dynamics across the North American taiga-tundra ecotone. North American Carbon Program Meeting. March 2021 online.

Epstein, H., L. Cho, C. Griffin, M. Jull, L.F. Rosado Murillo, M. Nelson, M. Shaban, and C. Wylie. Understanding the changing natural-built environment in an Arctic community: An integrated sensor network. Arctic Science Summit Week, March 2021 online.

Tassone, M., H. Epstein, A. Armstrong, and D. Alcaraz. Drivers of temporal variability in vegetation productivity on the Yamal Peninsula, Siberia, Russia. Arctic Science Summit Week, March 2021.

Gay, B., A. Armstrong, B. Osmanoglu, P. Montesano, K. Ranson, and H. Epstein. Examination of current and future permafrost dynamics across the North American tundra-taiga ecotone. European Geophysical Union Meeting, April 2021.

Heffernan, E., A. Armstrong, P. Montesano, B. Osmanoglu, B. Gay, H. Shugart, K. Ranson, and H. Epstein. Exploring the vulnerability to change across the taiga-tundra ecotone: Local and global drivers of growth at the tundra-taiga ecotone NASA ABoVE Science Team Meeting. May 2021 online.

Gay, B., A. Armstrong, B. Osmanoglu, P. Montesano, K. Ranson, and H. Epstein. Examination of current and future permafrost dynamics across the North American tundra-taiga ecotone. International Boreal Forest Research Association (IBFRA) Conference August, 2021 online.

Heffernan, E., A. Armstrong, P. Montesano, B. Osmanoglu, B. Gay, H. Shugart, K. Ranson, and H. Epstein. Integrating tundra PFTs into an individual-based boreal forest gap model to capture vegetation dynamics at the tundra-taiga ecotone: How we are modeling shrubs. International Boreal Forest Research Association (IBFRA) Conference August, 2021 online.

Montesano, P., A. Armstrong, B. Osmanoglu, B. Gay, E. Heffernan, H. Shugart, K. Ranson, and H. Epstein. High resolution simulations of forest structure change across the North American taiga-tundra ecotone. International Boreal Forest Research Association (IBFRA) Conference August, 2021 online.

Malcomb, J.D., Scanlon, T.M., Epstein, H.E., Vadeboncoeur, M.A., Druckenbrod, D., Wang, L., Lanning, M. Soil nutrient manipulations alter tree growth but not water use efficiency in temperate forests. Ecological Society of America Meeting. August 2021.

Epstein, H., A. Armstrong, D. Alcaraz-Segura, M. Tassone, E. Montefiori, and M. Raynolds. Assessing the diversity of ecosystem functional types in the circumpolar Arctic tundra. NASA Ecological Forecasting and Biodiversity Meeting, October, 2021 online.

Epstein, H., L. Cho, C. Griffin, M. Jull, L.F. Rosado Murillo, M. Nelson, M. Shaban, and C. Wylie. Understanding the changing natural-built environment in an Arctic community: An integrated sensor network. Regional Conference on Permafrost, Boulder, CO, October 2021.

Griffin, C.G., K. Kent, T. Jorgenson, A. Liljedahl, and H. Epstein. 2021. Landscape connectivity and dissolved organic matter in a degrading permafrost polygonal landscape. Regional Conference on Permafrost, virtual meeting (virtual talk), October 2021.

Kent, K., H. Epstein, C. Griffin, T. Jorgenson, A. Liljedahl, R. Daanen, M. Kanevskiy, and Y. Shur. Soil and plant community characteristics across successional stages of ice-wedge degradation and re-stabilization in the tundra of northern Alaska. Regional Conference on Permafrost, Boulder, CO, October 2021.

Epstein, H., A. Armstrong, D. Alcaraz-Segura, M. Tassone, E. Montefiori, and M. Raynolds. Arctic ecosystem functional diversity. Group on Earth Observations Week, November 2021 online.

Epstein, H., A. Armstrong, D. Alcaraz-Segura, M. Tassone, and M. Raynolds. Assessing the controls on ecosystem functional diversity in the Arctic tundra at circumpolar and regional scales. American Geophysical Union Meeting, New Orleans, December 2021.

Armstrong, A., P. Montesano, B. Osmanoglu, E. Heffernan, B. Gay, K. Ranson, H. Shugart, and H. Epstein. High resolution simulations of forest structure project heterogeneous change across the North American taiga-tundra ecotone. American Geophysical Union Meeting, New Orleans, December 2021.

Bulzoni, S., A. Armstrong, E. Heffernan, J .Malcomb, P. Montesano, and H. Epstein. Drivers of growth in boreal Alaska and Canada from a tree ring perspective. American Geophysical Union Meeting, New Orleans, December 2021.

Daanen, R., A. Liljedahl, H. Epstein, A. Gaedeke, and J. Schulla. Simulating Arctic hydrology with WaSiM. American Geophysical Union Meeting, New Orleans, December 2021.

Frost, G., A. Derkacheva, K. Ermokhina, and H. Epstein. Recent acceleration of shrub expansion in Siberian tundra detected at high resolution using convolutional neural networks. American Geophysical Union Meeting, New Orleans, December 2021.

Gay, B., A. Armstrong, P. Montesano, B. Osmanoglu, K. Schaefer, H. Epstein, and K. Ranson. Understanding active layer thickness variability under changing climatic conditions across the North American taiga-tundra ecotone. American Geophysical Union Meeting, New Orleans, December 2021.

Griffin, C., K. Kent, H. Epstein, and A. Liljedahl. Effects of watershed position, landscape connectivity, and ice wedge degradation on dissolved organic matter dynamics at Prudhoe Bay, AK. American Geophysical Union Meeting, New Orleans, December 2021.

Heffernan, E., A. Armstrong, H. Epstein, P. Montesano, B. Osmanoglu, K. Ranson, and H. Shugart. Assessing Canadian boreal forest-tundra growth drivers via community analysis. American Geophysical Union Meeting, New Orleans, December 2021.

Huelsman, K., H. Epstein, and X. Yang. Examining phenology through spectral variability within and among deciduous canopies using aerial hyperspectral imagery. American Geophysical Union Meeting, New Orleans, December 2021.

Kent, K., H. Epstein, C. Griffin, A. Liljedahl, M.T. Jorgenson, R. Daanen, and M. Kanevskiy. Soil carbon and nitrogen, plant functional groups, and plant tissue nutrient content across successional stages of ice-wedge degradation and re-stabilization in the tundra of Prudhoe Bay, Alaska. American Geophysical Union Meeting, New Orleans, December 2021.

Malcomb, J.D., Scanlon, T.M., Epstein, H.E., Vadeboncoeur, M.A., Druckenbrod, D., Lanning, M., and Wang, L. When, where, and why does atmospheric CO_2 enhance water use efficiency in temperate mixed deciduous forests? American Geophysical Union Meeting, New Orleans, December 2021.

Nelson, M., M. Shaban, H. Epstein, L. Cho, T. Douglas, C. Griffin, A. Cooke, M. Jull, L.F. Rosado Murillo, L. Nelson, and C. Wylie. Understanding the Changing Natural-Built Landscape in an Arctic Community: An Integrated Sensor Study in Utqiaġvik, Alaska. American Geophysical Union Meeting, New Orleans, December 2021.

Parisien, A., and H. Epstein. The biogeochemical and structural consequences of temperate forest succession following agricultural abandonment: An empirical and theoretical approach. American Geophysical Union Meeting, New Orleans, December 2021.

Graduate Advisors and Supervisors:

William K. Lauenroth (M.S.)
Ingrid C. Burke (Ph.D.)
Marilyn D. Walker and F.S. (Terry) Chapin III (Post-Doctoral Supervisors)

Sponsored Research Scientists

Dr. Li Jiang (2022-present)
Dr. Xiaoqin Cheng (2019-2020)
Dr. Hesong Wang (2018-2019)
Dr. Amanda Armstrong (2018-2022)
Dr. Li Wei (2015-2016)
Dr. Gensuo Jiong Jia (2005-2008)

Graduate and Postdoctoral Advisees:

Dr. Maria Belke-Brea, postdoctoral research associate (Université Laval) (2021-present)
Dr. Claire Griffin, postdoctoral research associate (2019-present)
Dr. Alan Tepley, postdoctoral research associate (2015-2017)
Dr. Qin Yu, postdoctoral research associate (2012-2013)
Dr. Domingo Alcaraz Segura, postdoctoral research associate (2006-2008)
Dr. Mei Yu, postdoctoral research associate (2002-2004)
Dr. Gensuo Jiong Jia, postodoctoral research associate (1999-2003)
Itiya Aneece, Ph.D. 2016
(Department Graduate Teaching Award 2015)
(Virginia Space Grant Consortium Fellowship 2015)
Jeffrey Atkins, Ph.D. 2016
(Exploratory Research Award 2011)
(Huskey Exhibition 3rd-Place Poster in Physical Sciences 2012)
(Appalachian Stewardship Foundation Award 2012)
(Moore Research Award 2014)
(Trout Unlimited Award 2014)
Gerald (JJ) Frost, Ph.D. 2013
(*Exploratory Research Award 2008*)
(*Graduate Ecology Award 2009*)
(Moore Research Award 2010)
(Department Graduate Teaching Award 2011)
(Virginia Space Grant Consortium Award 2012)
Qin Yu, Ph.D. 2012
(*Exploratory Research Award 2009)*
(Moore Research Award, Summer Dissertation Acceleration Fellowship 2010)
Jin Wang, Ph.D. 2010
(Exploratory Research Award 2005)

(Outstanding Student Presentation – Biogeosciences AGU Joint Assembly 2006)
Lorelei Alvarez, Ph.D. 2010
(Graduate Ecology Award, Exploratory Research Award, Double Hoo Award 2005)
(Summer Dissertation Acceleration Fellowship 2007)
Junran Li (co-advised), Ph.D. 2008
Ben Cook (co-advised), Ph.D. 2007
(Moore Research Award 2005)
(Maury Prize 2007)
Ryan Emanuel (co-advised), Ph.D. 2007
(Graduate Hydrology Award 2003)
(All-University Graduate Student Teaching Award 2004)
(Moore Research Award 2006)
(Vice Presidential Research Grant, Huskey Exhibition Best Poster in Physical Sciences 2007)
Alexia Kelley, Ph.D. 2007
(Best Ph.D. Poster Envirodays 2003)
(Robert Ellison Interdisciplinary Award, Exploratory Research Award 2004)
(Moore Research Award 2005)
(GSAS Dissertation Year Fellowship 2006-2007)
Monika Calef (co-advised), Ph.D. 2003
(Moore Research Award 2001)
Zoe Bergman, M.S. 2022
(Exploratory Research Award 2020)
(Graduate Award in Ecology 2021)
Morgan Tassone, M.S. 2022
(Ellison-Edmonson Award 2020)
(Joseph K. Roberts Award 2021)
Kelsey Huelsman, M.S. 2019
(Exploratory Research Award 2017)
Kelcy Kent, M.S. 2018
Sara Bratsch, M.S. 2016
Jennifer McGarvey, M.S. 2013
Anne Priest, M.S. 2005
Sebastian Riedel, M.S. 2001
(Best M.S. Poster Envirodays 2001)
Michelle Henry, M.A. 2011
Joshua Richards, M.A. 2010
Elise Heffernan, Ph.D. candidate
Kesley Huelsman, Ph.D. candidate
(Virginia Space Grant Consortium Fellowship 2020-2022)
(All-University Graduate Teaching Award 2021)
(EXPAND Fellowship 2021-2022)
Kelcy Kent, Ph.D. candidate
(Department Graduate Teaching Award 2019)
(Exploratory Research Award 2020)
Mackenzie Nelson, Ph.D. candidate
Jacob Malcomb (co-advised), Ph.D. candidate
(Exploratory Research Award 2017)
(Graduate Hydrology Award 2018)
(Data Science Fellowship 2019)
(Jefferson Conservation Award 2021)
(Department Graduate Teaching Award 2022)
Alex Parisien, Ph.D. candidate
(Exploratory Research Award 2017)
(Graduate Ecology Award 2018)
(Moore Research Award 2019)
(Department Graduate Teaching Award 2020)

Mirella Shaban, Ph.D. candidate
Wayne Dawson III, M.S. candidate
(Virginia Space Grant Consortium Fellowship 2022)
(Exploratory Research Award 2022)

Graduate Committee Member for:
Iuliia Shevtsova, Ph.D. (2022) (Alfred Wegner Institute), Stephanie Roe, Ph.D. (2021), Charles Scaife, Ph.D. (2021), Melissa Hey, Ph.D. (2020), Bea Cazorla, Ph.D. (2020 – University of Granada), Andrew Martin Ph.D. (2019 – Oxford University), Ingmar Nitze, Ph.D. (2018 – University of Potsdam), Michael Saha, Ph.D. (2018), Maitane Iturrate, Ph.D. (2017 - University of Zurich), Erin Swails, Ph.D. (2017), Jerome Stenger, M.S. (2017), Adrianna Foster, Ph.D. (2016), Benjamin Liebov, Ph.D. (2016 - Chemistry), Kailiang Yu, Ph.D. (2016), Blair Jenet, M.A. (2016), Grace Wilkinson, Ph.D. (2015), Jonathan Walter, Ph.D. (2014), Yufei He, Ph.D. (2013), Thoralf Meyer, Ph.D. (2013), Clayton Cope, M.A. (2013), Jedd Moore, M.A. (2013), Michael Salopek, M.A. (2013), David Atkinson, Ph.D. (2012 - Queen's University), Rishiraj Das, Ph.D. (2012), Anna Estes, Ph.D. (2012), Jennifer Holm, Ph.D. (2012), Emmanuel Munyangabe, Ph.D. (Physics 2012), Anzhi Zhang, Ph.D. (2010, Chinese Academy of Science, Institute for Atmospheric Physics), David Lutz, Ph.D. (2010), Jacquelyn Shuman, Ph.D. (2010), Karen Vandecar, Ph.D. (2010), Luke Sitka, M.S. (2010), Amanda Armstrong, Ph.D. (2009), Cheney Shreve, Ph.D. (2009), Diego Riveros, Ph.D. (2008, Montana State University), Lixin Wang, Ph.D. (2008), Robert Heckman, M.S. (2008), Natasha Ribiero, Ph.D. (2007), Lydia Ries, Ph.D. (2007), Jenica Allen, M.S. (2007), Gina Casciano, M.S. (2007), Amanda Floyd, M.S. (2007), David Lutz, M.S. (2007), Katherine Tully, M.S. (2007), Tana Wood, Ph.D. (2006), Heather Lloyd, M.S. (2006), Sanghoon Kang, Ph.D. (2005), Lilian Minja, Ph.D. (2005, Civil Engineering), John Dietter, M.S. (2005), Erin Potter, M.S. (2005), Sy Miin Chow, Ph.D. (2004, Psychology), Christopher Williams, Ph.D. (2004, Duke University, Civil Engineering), Lucy Diekmann, M.S. (2004), Sayedul Choudhury, Ph.D. (2003, Civil Engineering), Cassondra Thomas, Ph.D. (2003), Cesar Carrion, M.S. (2003), Ryan Emanuel, M.S. (2003), Tom Kennedy, M.S. (2003), Julieta Aranibar, Ph.D. (2002), Todd Scanlon, Ph.D. (2002), Xiaoyue Zhen, Ph.D. (2002, Civil Engineering), Keya Chatterjee, M.S. (2002), Tana Wood, M.S. (2002), Larissa Read, M.S. (2001), Laura A. Murray, M.S. (1999), David Crowe, Ph.D. candidate, Marion McKenzie, Ph.D. candidate, Ruoyu Zhang, Ph.D. candidate, Maria Trinidad Torres Garcia, Ph.D. candidate (University of Almeria)

Undergraduate Thesis Advisees:
Kingston Kim (2022)
Anna Liang (2022, Highest Distinction)
Anthony Murphy-Neilson (2022, Highest Distinction)
Sophie Wong (2022, Highest Distinction)
Matthew Armstrong (co-advised with Biology, 2021)
Jordan Chapman (2019, Distinction)
Damla Cinoglu (2019, High Distinction)
Reese Fulgenzi (2019, Echols Interdisciplinary)
Yvonve Dinh (co-advised, 2018)
Gabriella Freckmann (2018)
Matthew Shippee (co-advised, 2018, High Distinction)
James Thorndike (2018, High Distinction)
Leah Reichle (2017, Highest Distinction, *Mahlon G. Kelly Prize*)
Adrianna Gorsky (2016, High Distinction)
Arianna Sherman (2015, Chemistry)
Rebecca Walker (2015, Anthropology, *Harrison Award, Raven Fellowship*)
Rebecca Walker (2014, Highest Distinction, *Interdisciplinary Award*)
Sang Mee Ko (2014)
Jessica Neblett (2014)
Kathleen O'Rourke (2014, Slavic Languages and Literature)
Pemberton Heath (2012, Political and Social Thought)
John Tran (2011, Distinction)
Kendall Singleton (2007, Distinction)
Sara Wozniak (2007, High Distinction)
Katherine Hamel (2006, High Distinction, *Double Hoo Award*)
Torrey Browne (2004, High Distinction)

Luke Dupont (2004, Distinction)
Zulay Lidster (2004, High Distinction)
William Yeatman (2002, Distinction)
Christina Spellerberg (2001, High Distinction, *Interdisciplinary Award)*

Undergraduate Thesis Committees:
Abby Credicott (2012)
Kate Walsh (2011)

Additional Undergraduate and Graduate Research Advisees:
Henry Chin (2021-present)
Lindsay Grose (2021-present)
Sophie Wong (2019-present, *Community Based Undergraduate Research Grant, Hart Family Award for Undergraduate Research*)
Magnolia Matthews (2019-2021, *Community Based Undergraduate Research Grant*)
Xioali Tai (2018-2019, *CSC* Ph.D. student)
Lucie Cervena (2018, Charles University Ph.D. student)
Kole Bowersox (2018-2021, *USOAR*)
Katherine McCool (2018)
Custis Coleman (Science, Technology, and Society Capstone, 2017)
Daniel Collins (2017-2021, *USOAR*)
Carolyn Pugh (2017)
Yvonne Dinh (2017-2018, *Hart Family Award for Undergraduate Research*)
Megan Eisenfelder (2016-present, *Center for Global Health, College Council, Center for Global Inquiry and Innovation Grants*)
Emily Chen (2016-2017, *USOAR*)
Aaron Winn (2015-2016, *USOAR*)
Hayes Fountain (2015-2016, *Harrison Award, Undergraduate Travel Award*)
Heather Landes (2014-2017)
Leah Reichle (2014-present, *USOAR*)
Victoria Meakem (2014)
Emma Hauser (REU – 2014, *Callaghan Award*)
Casey McCabe (REU - 2012)
Daniel Walton (REU - 2010)
Taylor Martin, George McFadden, Anne Stine (REU - 2007)
Crystal Bennett (REU - 2006)
Jaida Collins, Leyland del Re (REU - 2005)
Emily Mazure (REU - 2004)
Dan McGlinn, Matt Reynolds (REU - 2003)
Torrey Browne (REU - 2002, Blandy 2003)
(Best Undergraduate Poster Envirodays 2003)
Ryan Emanuel (Blandy M.S. student, 2002, 2003)
(Best M.S. Presentation Envirodays 2003)
Clay Morris (REU - 2002)
William Yeatman (REU - 2001)
Jerry Mcguire, Alex Thorn (REU - 2000)

Courses Taught:
Sustainable Business Certificate (McIntire School of Commerce - online) University of Virginia
Fundamentals of Ecology, (EVSC 320, EVSC 3200) University of Virginia
Ecosystem Ecology and Biogeochemistry, (EVSC 425) University of Virginia
Environmental and Biological Conservation Seminar (EVSC 493, EVSC 4142, EVSC 4559, EVSC 4991) University of Virginia
Stream Health Monitoring, (EVSC 493) University of Virginia
Ecology of Grasslands and Tundra, (EVSC 426, EVSC 4260, EVSC 7559) University of Virginia
Ecology and Geology of National Parks (EVSC 494) University of Virginia

Capstone Seminar: The Arctic (EVSC 494) University of Virginia
Special Topics in Ecology, (EVSC 494/796, EVSC 4559/5559/7559) University of Virginia
Terrestrial Ecology, (EVEC 522, EVEC 5220) University of Virginia
Research Methods in Environmental Sciences (EVSC 793) University of Virginia
Arctic Ecosystems in a Changing Environment (EVSC 225), Second Year Seminar, University of Virginia
Sites and Systems (EVSC 4559) University of Virginia
A Scientist's Guide to Communicating Scientific Knowledge (INST 1550), University of Virginia
Remote Sensing, LiDAR, and Photogrammetry (ARTH 3559), University of Virginia

University of Virginia Service:
Chair, Department of Environmental Sciences, 2019-present
EXPAND Fellowship Steering Committee, 2022-present
Director of Graduate Studies, Department of Environmental Science, 2013-2018
Co-Director *of College Science Scholars Program* 2008-present
Committee to Imagine the Future of the Graduate School, 2016-2019
Echols Scholars Faculty Fellow – 2013-2019
National Fish and Wildlife Foundation, Summer Internship Program – 2012-2019
"Days on the Lawn" Panel Member – 2012-present
Robert Huskey Graduate Research Award Judge – 2007, 2012-2019
Lower Division Advising Fellow, College of Arts & Sciences - 2003-2021
Global – Programs of Distinction, Selection Committee – 2016-2019
Global Certificate Committee – 2016-2018
Summer Orientation Advising – 2000-2009, 2014-2017
Undergraduate Research Network Symposium Judge – 2016, 2018
Cavalier Travels, Office of Engagement, Alumni Education Participant – 2011, 2013, 2015, 2018
Chair Selection Committee, Department of Biology, 2015, 2017
Pan University Center for Global Inquiry (Development Committee), 2016-2017
Graduate Committee on Educational Policy and the Curriculum (GCEPC), 2014-2017
Jefferson Scholars Foundation Graduate Selection Committee – 2014-2016
Climate Change Panel – Cavalier Weather Service - 2015
Arctic Design Initiative, Collaborator, Jefferson Trust – 2014-2015
Authentic Learning Initiative – 2014-2015
Amazon Aid Internship Program – 2010-2011, 2014-2015
Global Research Confab, Organizational Committee, Center for Global Inquiry and Innovation – 2014
Faculty Advisory Committee, Graduate School of Arts and Sciences - 2013-2014
VA-NC STEM Alliance – 2012-2014
Excellence in Diversity Fellows Mentor – 2012-2013
Judge – UVA Postdoctoral Research Day Symposium – 2013
Global Change Working Group, International Studies Office – 2011-2013
Study Abroad Committee, College of Arts & Sciences – 2012
Marshall Award Mock Interviewer, Center for Undergraduate Excellence – 2012
Engage UVA Flash Seminar - 2012
Promotion and Tenure Committee, College of Arts & Sciences – 2011-2012
Vice President for Research and Graduate Studies, Internal Review Committee – 2007-2012
Committee on Budget and Personnel Policy, College of Arts & Sciences – 2007-2012
Co-Director *of Undergraduate Programs (DUP)*, Department of Environmental Science, 2008-2011
Co-Director *of the Program for Environmental and Biological Conservation*, Departments of Environmental Science and Biology, University of Virginia, 2002-2005, 2009-2011
Double Hoo Award Judge – 2009, 2011
Harrison Award Judge – 2009
First Year Student Council Program Participant – 2008
University Sustainability Assessment Participant – 2006-2007
Professor's Picks Winter Break Book Club – 2005-2007
College Science Scholars Program – 2003–2007
Tomorrow's Professor Today Advisor – Jeff Atkins, (Ph.D), Itiya Aneece (Ph.D), Rosemary Malfi (Ph.D. candidate), Lixin Wang (Ph.D.)

Broader Scientific and Education Service:

Guest Editor - Special Issue of Big Earth Data on Remote Sensing Thematic Products and Their Application to Environmental Change in the Antarctic, Arctic, and Qinghai-Tibet Plateau - 2021

Contributing Author for the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate - 2019

Co-Chair – Vegetation Dynamics Working Group, NASA Arctic Boreal Vulnerability Experiment (ABoVE) – present

Board of Directors – Arctic Research Consortium of the United States (ARCUS) – 2013-2019

Co-Chair – Environmental Working Group, Digital Belt and Road Initiative, Chinese Academy of Sciences – 2016-present

Fullbright Specialist Program – University of Buenos Aires – June 2014

Asia-Pacific Network for Global Change Research, International Training of Ecosystem-Climate Interactions, Beijing, China, September 2014

Visiting Professor for Senior International Scientists, Chinese Academy of Sciences – 2013-2014

Journal Associate Editor: Ecosphere 2010-2015

Journal Associate Editor: Plant Ecology 2008-2012

*Reader Panel – **Nature*** 2008-2009

Guest Editor, ***Special Issue of Remote Sensing*** on *Remote Sensing of Arctic Tundra*

Organized ***Special Issue of Ecosystems*** – *Ecosystem and Socio-Ecological Functional Types*

Organized ***Special Issue of Environmental Research Letters*** on *Dynamics of Arctic and Sub-Arctic Vegetation*

Organized ***Special Issue of Journal of Geophysical Research – Biogeosciences*** on *Biocomplexity of Arctic Tundra Ecosystems*

Publication and Proposal Reviewer:

Agricultural and Forest Meteorology, American Journal of Botany, Applied Geochemistry, Applied Geography, Applied Vegetation Science, Arctic, Arctic Antarctic and Alpine Research, Arctic Science, Biodiversity and Conservation, Biogeochemistry, Biogeosciences, Canadian Journal of Botany, Climate Dynamics, Climate Research, Climatic Change, Computing in Science and Engineering, Ecography, Ecological Applications, Ecological Modeling, Ecological Monographs, Ecology, Ecoscience, Ecosphere, Ecosystems, Environmental Earth Sciences, Environmental Health Perspectives, Environmental Management, Environmental Research Letters, Fennia-International Journal of Geography, Frontiers in Ecology and the Environment, Functional Ecology, Geology, Geophysical Research Letters, Global and Planetary Change, Global Change Biology, Global Biogeochemical Cycles, Global Ecology and Biogeography, Global Environmental Change, International Journal of Ecology, International Journal of Remote Sensing, International Journal of Wildland Fire, Journal of Applied Ecology, Journal of Arid Environments, Journal of Arid Land, Journal of Biogeography, Journal of Ecology, Journal of Ecology and Biogeography Letters, Journal of Geophysical Research – Biogeosciences, Journal of Hydrology, Journal of Plant Ecology, Journal of Vegetation Science, Land Degradation and Development, Landscape Ecology, Nature, Nature Climate Change, Permafrost and Periglacial Processes, Philosophical Transactions of the Royal Society B, New Phytologist, Oecologia, Plant and Soil, Plant Ecology, PLoS One, Proceedings of the National Academy of Science, Rangeland Ecology and Management, Rangifer, Rapid Communications in Mass Spectrometry, Remote Sensing, Remote Sensing of Environment, Science, Science of the Total Environment, Scientific Reports, Water Resources Research

Benjamin Cummings / Addison Wesley Publishing, Springer-Verlag Publishing

National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), United States Department of Agriculture (USDA), Department of Energy (DOE), National Park Service (NPS), Natural Environment Research Council, UK (NERC), Netherlands Organisation for Scientific Research (NWO), Swiss National Science Foundation, The National Academies, U.S. Civilian Research and Development Foundation (U.S. CRDF), Center for Global Change (CGC) and Arctic System Research, Georgian National Science Foundation, Research Council of Norway (RCN), Jeffress Trust Awards, Danish Council for Independent Research

Panel Member – Development and Inaugural Class Selection of the University of Texas System Distinguished Teaching Academy – 2012-2013

Review Panel Member:

NASA Earth Science Enterprise (ESE) Interdisciplinary Science (IDS) – 2003

Arctic Research Consortium of the U.S. (ARCUS) Award for Arctic Research Excellence – 2003

Program Reviewer:

National Research Council of the National Academy of Sciences, Challenges and Opportunities in Hydrological Sciences - 2011

Committee of Visitors for National Science Foundation Office of Polar Programs – 2003

Participant in the US-UK Arctic Workshop, Cambridge, UK, October 2012

Participant in the NASA Workshop on the Arctic Boreal Vulnerability Experiment (ABoVE), Boulder, CO, June 2012

Participant in the International Study for Arctic Change Working Group, Kingston, Ontario, Canada, February 2012

Participant in the Global Land Project (GLP) Dryland Productivity Workshop, Copenhagen, Denmark, January 2009

Participant in the National Center for Ecosystem Analysis and Synthesis study on "The fate of nitrogen inputs to terrestrial ecosystems."

Participant in the International Geosphere-Biosphere Programme (IGBP) Fast Track Initiative on Plant Functional Types.

Session Chair – American Geophysical Union, December 2000; European Geophysical Society, April 2005; American Geophysical Union, May 2006; American Geophysical Union, December 2006 (two sessions); Ninth International Conference on Permafrost, July 2008, American Geophysical Union, December 2010, American Geophysical Union, December 2011; International Polar Year, April 2012; Circumpolar Remote Sensing Symposium, May 2012; Ecological Society of America Meeting, August 2013, American Geophysical Union, December 2016, Arctic Science Summit Week, April 2017, American Geophysical Union, December 2017; American Geophysical Union, December 2020; American Geophysical Union, December 2021

Braun and Buell Award Judge - Ecological Society of America meeting – 1998, 2000-2002, 2013

Other Conference Award Judging – American Geophysical Union meetings (2002-2012, 2014-2017, 2020), International Polar Year 2012, 2016

Local Community Service and Outreach

Albemarle County Schools, Guest Teaching – 2003-2019

Albemarle County Schools, Environmental Studies Academy, Operational Advisory Board – 2014-2015

Albemarle High School Envirothon Lecturer – 2011, 2016

StreamWatch Internship Program – 2006-2011

Congregation Beth Israel Green Committee – 2008-2011

Virginia Natural Resource Leadership Initiative Climate Change Panelist – 2011

Jefferson Soil and Water District Envirothon Judge – 2009

Honors and Awards:

Maury-Tice Prize, Department of Environmental Sciences, University of Virginia, 2018

All-University Teaching Award, University of Virginia, 2012

Environmental Sciences Organization Excellence Award, Department of Environmental Sciences, University of Virginia 2010, 2015

University Distinguished Faculty Speaker, Alumni Education, Office of Engagement, University of Virginia, 2010-2012, 2016, 2020

Leadership in Academic Matters, University of Virginia, Fall 2012

Seven Society Monticello Dinner Series - 2011

Mead Endowment Honored Faculty, College of Arts and Sciences, University of Virginia, 2004-2005

Consulting:

Signature Science, LLC, Austin, TX – greenhouse gas measurement strategy (2009-2010)

John Milner Associates, Inc., Louisville, KY – Cultural Landscape Report for Grand Portage National Monument, Grand Portage, MN (2008-2009)

GreenBlue – development of Certificate in Sustainable Business online course