

David A. Lutz

Assistant Research Professor
Environmental
Studies

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A: Department of Environmental Studies
Dartmouth College

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Professional Experience

Assistant Research Professor
Aug. 2017 – present

**Post-Doctoral Research
Associate**
Oct. 2012 – Aug. 2017

Aug. 2011 – Sep. 2012

Dartmouth College

Environmental Studies Program

Research Topics: Remote sensing of global change; Computational Forest ecosystem modelling; Ecosystem services; Wireless sensor networks; Machine learning and computer vision; Forest ecology; Climate change adaptation; Forest carbon markets; Remote sensing of temperate and tropical lakes.

Advisor: Dr. Richard Howarth

Research Topics: Coupled ecological economic modelling of temperate forests; Ecosystem service valuation; Remote Sensing of temperate forests; Integrated assessment modelling; Role of forest carbon in regulatory carbon markets.

Wake Forest University

Advisor: Dr. Miles Silman

Research Topics: Remote sensing of Andean cloud forest; Climate change impacts on tropical forests; Unmanned Aerial Vehicle development.

Education

Ph. D. Environmental Sciences
Jan. 2008 – Dec. 2010

M.S. Environmental Sciences
Aug. 2005 – Dec. 2007

B. S. Biology with Honors
Aug. 2000 – May 2004

University of Virginia

Advisor: Dr. Herman H. Shugart

Dissertation: Ecological and Economic Consequences of Climate on Eurasian Boreal Forests

M.S. Thesis: Remote Sensing of Russian and Chinese Forests:
Examination of Community Patterns for Forest Model Testing

Wake Forest University

Honors Thesis: Detecting Tropical Montane Tree Line Variation at a
Latitudinal Scale Using Remotely Sensed Data
cum laude

Publications (32)

E. N. Dethier, M. Silman, J. D. Leiva, S. Alqahtani, L. E. Fernandez, V. P. Pauca, S. Camalan, F. J. Magilligan, C. E. Renshaw, and **D. A. Lutz**. *Accepted*. Alluvial gold mining is a major threat to global tropical rivers. *Nature*.

E. N. Dethier, M. R. Silman, L. E. Fernandez, J. C. Espejo, S. Alqahtani, V. P. Pacua, **D. A. Lutz**. *Accepted*. Operation Mercury: Impacts of National-Level Military Based Enforcement Strategy and COVID-19 on Artisanal Gold Mining and Water Quality in a Biodiversity Hotspot in the Peruvian Amazon. *Conservation Letters*.

C. M. Hewitt, N. J. Casson, A. R. Contosta, J. L. Campbell, **D. A. Lutz**, A. T. Morzillo, and I. F. Creed. *Accepted*. Coupled human-natural system impacts of a winter weather whiplash event. *Ecology and Society*.

S. Ahmed, **D. A. Lutz**, J. Rapp, R. Huish, B. Dufour, A. Brunelle, T.L. Morelli, K. Stinson, and T. Warne. 2023. Climate change and maple syrup: Producer observations, perceptions, knowledge, and adaptation strategies. *Frontiers in Forests and Global Change*, 6, 1092218.

Z. Read, S. Fraver, A. D'Amato, D. M. Evans, K. Evans, **D. A. Lutz**, and C. W. Woodall. *Accepted*. CO₂ flux from *Acer saccharum* logs: Sources of variation and the influence of silvicultural treatments. *Canadian Journal of Forest Research*.

A. C. Foster, J. A. Wang, G. V. Frost, S. J. Davidson, E. Hoy, K. W. Turner, O. Sonentag, H. E. Epstein, L. T. Berner, A. H. Armstrong, M. Kang, B. M. Rogers, E. Campbell, K. R. Miner, K. M. Orndahl, L. L. Bourgeau-Chavez, **D. A. Lutz**, N. French, D. Chen, J. Du, T. A. Sheskatova, J. K. Shuman, K. Tape, A-M. Virkkala, C. Potter, and S. Goetz. 2022. Disturbances in North American boreal forest and tundra: impacts, interactions, and responses. *Environmental Research Letters*, 17, 113001.

C. Herrick, B. G. Steele, J. A. Brentrup, K. L. Cottingham, M. J. Ducey, **D. A. Lutz**, M. W. Palace, M. C. Thompson, J. V. Trout-Haney, and K.C. Weathers. 2022. lakeCoSTR: A tool to facilitate use of the Landsat Collection 2 to estimate lake surface water temperatures. *Ecosphere*. DOI:10.1002/ecs2.4357

S. Camalan, K. Cui, V. P. Pauca, S. Alqahtani, M. R. Silman, R. Chan, R. J. Plemmons, E. N. Dethier, L. E. Fernandez, **D. A. Lutz**. 2022. Change Detection of Amazonian Alluvial Gold Mining in Sentinel-2 Imagery Using Deep Learning. *Remote Sensing*, 14(7), 1746.

M. B. Green, S. Fraver, **D. A. Lutz**, C. Woodall, A.W. D'Amato, K. Evans. 2022. Does deadwood moisture vary jointly with surface soil water content? *Soil Science Society of America*, 86(4), 1113-1121.

H. J. Rubin*, **D. A. Lutz**, B. G. Steele, K. L. Cottingham, K. C. Weathers, M. J. Ducey, K. M. Johnson, J. W. Chipman. 2021. Remote Sensing of Lake Water Clarity: Performance and Transferability of Both Historical Algorithms and Machine Learning. *Remote Sensing*, 13(8), 1434.

C. W. Woodall, D. M. Evans, S. Fraver, M. B. Green, **D. A. Lutz**, A. W. D'Amato. 2020. Real-time monitoring of deadwood moisture in forests: lessons learned from an intensive case study. *Canadian Journal of Forest Research*, 1–9.

J. M. Rapp, **D. A. Lutz**, R. D. Huish, B. Dufour, S. Ahmed, T. Lyn Morelli, K. A. Stinson. 2020. Sugar maple responses to climate change: We'll boil it down for you. *Forest Ecology and Management*. 458: 117760.

- N. J. Casson, A. R. Contosta, E. A. Burakowski, J. L. Campbell, M. S. Crandall, I. F. Creed, M. C. Eimers, S. Garlick, **D. A. Lutz**, M. Q. Morison, A. T. Morzillo, S. J. Nelson. 2019. Winter weather whiplash: impacts of meteorological events misaligned with natural and human systems in seasonally snow-covered regions. *Earth's Future*. 7(12): 1434-1450.
- J. M. Rapp, **D. A. Lutz**, R. D. Huish, B. Dufour, S. Ahmed, T. L. Morelli, K. A. Stinson. 2019. Finding the sweet spot: Shifting optimal climate for maple syrup production in North America. *Forest Ecology and Management*. 448L 187–197.
- R. A. Finger Higgens, J. W. Chipman, **D. A. Lutz**, L. E. Culler, R. A. Virginia, L. A. Ogden. 2019. Changing Lake Dynamics Indicate a Drier Arctic in Western Greenland. *Journal of Geophysical Research: Biogeosciences*. 124(4): 870-883.
- M. E. Borsuk, G. Mavrommati, N. R. Samal, S. Zuidema, W. Wollheim, S. H. Rogers, A. M. Thorn, **D. A. Lutz**, M. Mineau, C. Grimm, C. P. Wake, R. Howarth, K. Gardner. 2019. Deliberative multiattribute valuation of ecosystem services across a range of regional land-use, socioeconomic, and climate scenarios for the upper Merrimack River watershed, New Hampshire, USA. *Ecology and Society*. 24(2).
- E. N. Dethier, S. L. Sartain*, **D. A. Lutz**. 2019. Heightened levels and seasonal inversion of riverine suspended sediment in a tropical biodiversity hot spot due to artisanal gold mining. *Proceedings of the National Academy of Sciences*. 116(48): 23936-23941.
- A. E. White*, **D. A. Lutz**, R. B. Howarth, J. R. Soto. 2018. Small-scale forestry and carbon offset markets: An empirical study of Vermont Current Use forest landowner willingness to accept carbon credit programs. *PLoS One*. 13(8), e0201967.
- R. Astrup, P. Y. Bernier, H. Genet, **D. A. Lutz**, R. M. Bright. 2018. A sensible climate solution for the boreal forest. *Nature Climate Change*. 8(1): 11-12.
- N. R. Samal, W. M. Wollheim, S. Zuidema, R. J. Stewart, Z. Zhou, M. M. Mineau, M. E. Borsuk, K. H. Gardner, S. Glidden, T. Huang, **D. A. Lutz**, G. Mavrommati, A. M. Thorn, C. P. Wake, M. Huber. 2017. A coupled terrestrial and aquatic biogeophysical model of the Upper Merrimack River watershed, New Hampshire, to inform ecosystem services evaluation and management under climate and land-cover change. *Ecology and Society*. 22(4).
- D. A. Lutz**, E. A. Burakowski, M. B. Murphy*, M. E. Borsuk, R. M. Niemiec*, R. B. Howarth. 2016. Trade-offs between three forest ecosystem services across the state of New Hampshire, USA: timber, carbon, and albedo. *Ecological Applications*. 26(1): 146-161.
- D. A. Lutz**, R. B. Howarth. 2015. The price of snow: albedo valuation and a case study for forest management. *Environmental Research Letters*. 10(6): 064013.
- S. M. McDermott, R. B. Howarth, **D. A. Lutz**. 2015. Biomass Energy and Climate Neutrality: The Case of the Northern Forest. *Land Economics*. 91(2): 197-210.
- R. M. Niemiec*, **D. A. Lutz**, R. B. Howarth. 2014. Incorporating carbon storage into the optimal management of forest insect pests: a case study of the southern pine beetle (*Dendroctonus frontalis* Zimmerman) in the New Jersey Pinelands. *Environmental Management*. 54(4): 875-887.
- D. A. Lutz**, R. B. Howarth. 2014. Valuing albedo as an ecosystem service: implications for forest management. *Climatic Change*. 124(1-2): 53-63.

D. A. Lutz, R. L. Powell, M. R. Silman. 2013. Four decades of Andean timberline migration and implications for biodiversity loss with climate change. *PLoS One*. 8(9): e74496.

D. A. Lutz, H. H. Shugart, D. V. Ershov, J. K. Shuman, A. S. Isaev. 2013. Boreal forest sensitivity to increased temperatures at multiple successional stages. *Annals of Forest Science*. 70(3): 299–308.

D. A. Lutz, H. H. Shugart, M. A. White. 2013. Sensitivity of Russian forest timber harvest and carbon storage to temperature increase. *Forestry*. 86(2): 283–293.

R. A. Browne, **D. A. Lutz**. 2010. Lake ecosystem effects associated with top-predator removal due to selenium toxicity. *Hydrobiologia*. 655(1): 137–148.

D. A. Lutz, R. A. A. Washington-Allen, H. H. Shugart. 2008. Remote sensing of boreal forest biophysical and inventory parameters: a review. *Canadian Journal of Remote Sensing*. 34: s286–s313.

N. C. A. Pitman, K. Salas, M. Del Carmen Loyola Azáldegui, G. Vigo, **D. A. Lutz**. 2008. Historia e impacto de la literatura científica del Departamento de Madre de Dios, Perú. *Revista Peruana de Biología*. 15(2), 15-22.

N. C. A. Pitman, M. D. C. L. Azáldegui, K. Salas, G. T. Vigo, **D. A. Lutz**. 2007. Written accounts of an Amazonian landscape over the last 450 years. *Conservation Biology*. 21(1): 253–262.

*represents work performed as an undergraduate

Grants Awarded (12)

Total Associated Funds: \$11,641,012

Integrating Acoustic Recorders to Improve Wildlife and Forest Condition Assessments in Eastern NPS Parks. *United States Department of the Interior, National Parks Service*. PI: David Lutz (\$239,712) Principal Investigator.

Rapid Change and Development in a Tropical Biodiversity Hotspot: A Multi-Sensor Fusion Approach to Quantify Terrestrial and Aquatic Impacts and Test Policy Effectiveness. *NASA Land Cover Land Use Change*. PI: David Lutz (\$748,224) Principal Investigator.

Predicting Density and Occurrence of Keystone and Umbrella Species using Drone-Based LiDAR. *Northeastern States Research Cooperative*. PI: Alexej Sirén. (\$174,031) Co-Principal Investigator.

Leveraging Intelligent Informatics and Smart Data for Improved Understanding of Northern Forest Ecosystem Resiliency (INSPIRES). 2019-2022. *National Science Foundation EPSCoR Track-II*. PI: Aaron Weiskittel. (\$1,985,793) Senior Personnel.

A Wireless Sensor Network for Monitoring Fine-Scale Forest Ecosystem Responses to an Invasive Pest (Emerald Ash Borer). 2020-2021. *Neukom CompX Faculty Grant*. PI: David Lutz (\$22,711) Principal Investigator.

Automated Tools for Algae Bloom Data Collection and Analysis. 2019-2024. *National Science Foundation EPSCoR Track-III*. PI: Alberto Quattrini Li. (\$5,989,192) Co-Investigator.

Acquisition of marine multirobot systems for underwater monitoring and construction. 2019-2022. *National Science Foundation Major Research Instrumentation Track-I*. PI: Alberto Quattrini Li. (\$557,542). Co-Investigator.

Dynamic Modeling of Forest Ecosystem Processes and Services in North American Boreal Forests across the ABoVE Study Region. 2019-2022. *NASA Terrestrial Ecology*. PI: David Lutz (\$615,001) Principal Investigator.

Interactive Effects of Catchment and Climate Change on Water Quality in Forested North Temperate Lakes: Historic Trends and Future Predictions. 2017-2021. *NASA Interdisciplinary Science*. PI: David Lutz (\$1,478,539). Principal Investigator.

Woody Biofuels in the State of New Hampshire: Analyzing the Social and Environmental Impacts of Forest-Based Bioenergy in the Granite State. 2019-2021. *Irving Institute for Energy and Society*. PI: David Lutz (\$35,959). Principal Investigator.

Quantifying Point-Scale Water Response to Forest Management to Understand the Cumulative Regional Impact. 2017-2021. *United States Department of Agriculture, United States Forest Service*. (\$31,308). Principal Investigator.

ECOSERVICE: Approaches for integrated assessment of forest ecosystem services under large scale bioenergy utilization. 2017-2018. *Norwegian Research Council*. PI: Rasmus Astrup. (\$33,000). Research Associate.

Professional Service

Journal Reviewer

Science, Global Change Biology, Remote Sensing of Environment, Ecosphere, Journal of Ecology, Global Ecology and Biogeography, PLoS One, Climatic Change, Ecological Economics, Risk Analysis, Atmospheric Chemistry and Physics, Canadian Journal of Remote Sensing, Hydrological Processes, Southern Journal of Forestry, Environmental Management, Global Environmental Change, International Journal of Wildland Fire, Canadian Journal of Forest Research, Journal of Applied Ecology, Science of the Total Environment, Ecological Applications, Nature Plants.

Institutional Award Panelist

NASA Terrestrial Ecology Program: Sustaining Living Systems in a Time of Climate Variability and Change

NASA Terrestrial Ecology Program: Carbon Monitoring Systems

NASA Commercial SmallSat Data Analysis

NASA Ocean Biology and Biogeochemistry Program

NASA Land Cover Land Use Change Program

University Service

Dartmouth Second College Grant Management Committee (2019-present)

Moosilauke Advisory Committee (2019-present)

Faculty Advisor: the STEM Collective Living Learning Community (2017-2018)

Academic Liaison to Dartmouth Outdoor Programs Office (2018-2019)

Presentations (28)

Invited

D. A. Lutz. 2019. Dynamic Modeling of Forest Ecosystem Processes and Services in North American Boreal Forests. IARPC Terrestrial Ecosystems Collaboration Team Meeting. August 16, 2019.

D. A. Lutz. 2019. Investigating Changes in Forests Across Alaska and Canada. Tanana Valley State Forest Citizens' Advisory Committee Meeting. Fairbanks, AK. April 25, 2019. (*Presented remotely*)

D. A. Lutz. 2019. Harnessing Remote Sensing and Wireless Sensor Network Technology to Document Environmental Change. Colby College Environmental Studies Program Evening Lecture Series. Waterville, ME. March 5, 2019.

D. A. Lutz. 2017. Putting a Price on Carbon and Snow: Valuing Ecosystem-Atmospheric Interactions and their Impact on Climate Change. Cornell University BESS Seminar. November 10, 2017.

D. A. Lutz. 2017. Remote Sensing of the Environment: What is it and what does it tell us? Colby-Sawyer College Science Pub. New London, NH. October 19, 2017.

D. A. Lutz. 2016. Putting a Price on Carbon and Snow: Valuing Ecosystem-Atmospheric Interactions and their Impact on Climate Change. Wake Forest University Sustainability Lunch Series. Winston-Salem, NC. November 16, 2016.

D. A. Lutz, R. B. Howarth. 2015. Assigning a Price to Radiative Forcing: Methods, Results, and Implications. American Geophysical Union Fall Meeting. San Francisco, CA. December 14-18, 2015.

D. A. Lutz. 2015. Assigning a Price to Radiative Forcing: A Review of Methods, Results, and Implications. University of New Hampshire ESCI Seminar. Durham, NH. September 10, 2015.

D. A. Lutz. 2012. Ecological and Economic Consequences of Rising Temperatures on Russian Boreal Forests: Applications of Coupled Modeling Systems. World Wildlife Foundation Conservation Science Program monthly meeting. Washington, D.C. November 29, 2011.

Contributed (selected)

J.V. Trout-Haney, B. G. Steele, K. L. Cottingham, K. C. Weathers, J. A. Brentrup, C. Herrick, M. W. Palace, M. Thompson, M. J. Ducey, K. M. Johnson, F. Sullivan, B. D. Cook, and **D.A. Lutz.** 2022. Spatial and temporally dynamics of chlorophyll-*a* in northeastern temperate lakes revealed by two decades of remotely sensed data. August 17th, 2022. Ecological Society of America Meeting. Montreal, Canada.

B. G. Steele, C. Herrick, J. A. Brentrup, K. L. Cottingham, M. J. Ducey, **D. A. Lutz,** M. W. Palace, M. Thompson, J. V. Trout-Haney, and K. C. Weathers. 2022. lakeCoSTR: a tool to access and synthesize Landsat lake surface water temperature. August 15th, 2022. Ecological Society of America Meeting. Montreal, Canada.

E. Dethier, M. Silman, L. E. Fernandez, J. C. Espejo, S. Alqahtani, V. P. Pauca, **D. A. Lutz.** 2021. Shifts in the locus of artisanal gold mining and changes in water quality following national-level intervention in the Peruvian Amazon. December 15th, 2021. American Geophysical Union Fall Meeting. New Orleans, Louisiana.

K. L. Cottingham, K. C. Weathers, A. Q. Li, **D. A. Lutz,** M. E. Lofton, J. A. Brentrup, S. L. LaDeau, B. Steele, H. A. Ewing, C. C. Carey, A. Bourbonnais, D. A. Bruesewitz, M. J. Ducey, K. M. Johnson, M. W. Palace, I. Rekleitis, P. Stegagno, D. J. Balkcom, W. S. Beck, R. Bhattacharya, L. S. Brightenti, S. H. Burnet, B. Cook, C. Herrick, I. M. McCullough, C. N. Roman, H. J. Rubin, V. S. Subramanian, F. Sullivan, J. A. Zwart. 2020. Predicting cyanobacterial blooms in freshwater lakes: The promise of new partners, tools and technologies.

Ecological Society of America Annual Meeting. August 3-6, 2020. International Conference on Intelligent Robots and Systems. Macau, China. November 4-8, 2019.

A. Q. Li, H. Ewing, A. Bourbonnais, P. Stegagno, I. Rekleitis, D. Bruesewitz, K. L. Cottingham, D. J. Balkcom, M. Ducey, K. Johnson, S. Licht, **D. A. Lutz**, J. O'Kane, M. W. Palace, C. Roman, V. S. Subrahmanian, K. C. Weathers. 2019. Computational methods and autonomous robotics systems for modeling and predicting harmful cyanobacterial blooms.

N. J. Casson, A. Contosta, E. A. Burakowski, J. L. Campbell, M. S. Crandall, I. F. Creed, C. Eimers, S. Garlick, **D. A. Lutz**, A. T. Morzillo, S. J. Nelson, G. E. Arachchilage. 2019. Streamflow and water quality responses to winter weather whiplash events at long-term research sites. (*poster*) American Geophysical Union Fall Meeting. Washington, D.C. December 9-13, 2019.

D. A. Lutz, X. Yang, M. Lerdau, M. W. Palace, A. R. Foster, H. H. Shugart. 2019. Pixel to Process to Price: A Framework for Remote Sensing Ecological Model Fusion Analyses for Ecosystem Service Evaluation. (*poster*) American Geophysical Union Fall Meeting. Washington, D.C. December 9-13, 2019.

N. J. Casson, A. Contosta, E. A. Burakowski, J. L. Campbell, M. S. Crandall, I. F. Creed, C. Eimers, S. Garlick, **D. A. Lutz**, A. T. Morzillo, S. J. Nelson. 2019. Impacts of winter weather whiplash events on streamflow and water quality. Chapman Conference on Winter Limnology in a Changing World. Polson, Montana. October 14-18, 2019.

V. E. K. Pinney, **D. A. Lutz**, M. J. Ducey, K. L. Cottingham, K. C. Weathers, C. Herrick, M. W. Palace, B. Steele, F. Sullivan, J. Brentrup, J. V. Trout-Haney, K. A. Johnson. 2018. Chlorophyll-a Detection for 217 Maine Freshwater Lakes through the Use of Archived Data from LANDSAT Satellite Imagery, 23,000 *in situ* Samples, and Google Earth Engine. (*poster*) American Geophysical Union Fall Meeting. Washington, D.C. December 10-14, 2018.

N. J. Casson, A. Contosta, E. A. Burakowski, J. L. Campbell, M. S. Crandall, I. F. Creed, C. Eimers, S. Garlick, **D. A. Lutz**, A. T. Morzillo, S. J. Nelson, M. Q. Morrison. 2018. Winter weather whiplash: impacts of extreme meteorological events misaligned with natural and human systems in seasonally snow-covered regions. (*poster*) American Geophysical Union Fall Meeting. Washington, D.C. December 10-14, 2018.

R. Finger, J. W. Chipman, **D. A. Lutz**, L. E. Culler, R. A. Virginia, L. A. Ogden. 2018. A Drier Arctic? Evapotranspiration in Changing Lake Dynamics in Western Greenland. (*poster*) American Geophysical Union Fall Meeting. Washington, D.C. December 10-14, 2018.

E. A. Burakowski, **D. A. Lutz**. 2014. The Costs of Climate Change: Impact of Future Snow Cover Projections on Valuation of Albedo in Forest Management. (*poster*) American Geophysical Union Fall Meeting. San Francisco, CA. December 15-19, 2014.

D. A. Lutz, E. A. Burakowski, M. B. Murphy, M. E. Borsuk, R. M. Niemiec, R. B. Howarth. 2014. Tradeoffs between Three Forest Ecosystem Services across the State of New Hampshire, USA: Timber, Carbon, and Albedo. (*poster*) American Geophysical Union Fall Meeting. San Francisco, CA. December 15-19, 2014.

D. A. Lutz, R. B. Howarth. 2013. The Price of Snow: Valuing Albedo as an Ecosystem Service in Northeastern Forests. American Geophysical Union Fall Meeting. San Francisco, CA. December 9-13, 2013.

D. A. Lutz. 2013. Four Decades of Andean Timberline Migration and Implications for Biodiversity Loss with Climate Change. Center for Tropical Ecology and Conservation Annual Symposium on Climate Change in Tropical Developing Regions. Antioch College, Keene, NH. November 9, 2013.

D. A. Lutz, R. B. Howarth. 2013. Albedo as an Ecosystem Service and its Implications for Forest Management. U. S. Society for Ecological Economics Annual Meeting. Burlington, VT. June 10-12, 2013.

D. A. Lutz, H. H. Shugart. 2008. The Future of Eurasian Boreal Forests: Ecological Modeling Projections in the Russian Federation. (*poster*) American Geophysical Union Fall Meeting. San Francisco, CA. December 15-19, 2008.

D. A. Lutz, R. A. Washington-Allen. 2007. Remote Sensing of Boreal Forest Biophysical and Inventory Parameters: A Review. (*poster*) American Geophysical Union Fall Meeting. San Francisco, CA. December 10-14, 2007.

D. A. Lutz, H. H. Shugart. 2007. Validation of an Individual-Based Gap Model of the Eurasian Boreal Forest with Remote Sensing Imagery Analysis. American Geophysical Union Fall Meeting. San Francisco, CA. December 10-14, 2007.

Teaching and Mentoring

Courses Taught (14)

Global Environmental Change ENVS30

(9) Fall 2022, Fall 2021, Spring 2021, Fall 2019, Fall 2018, Fall 2017, Spring 2017, Winter 2016, Winter 2015.

This is an upper-level environmental science course that covers global biogeochemistry, atmospheric science, ecology, contemporary environmental issues, and environmental governance and policy.

Introduction to Environmental Science ENVS2

(1) Winter 2021

An introductory course covering the basics of environmental science, chemistry, hypothesis testing, and global change.

First Year Writing Seminar ENVS7, BIOL7

(4) Spring 2020, Spring 2019, Winter 2018, Winter 2017.

Writing seminar that focuses on scientific writing, interpreting scientific texts and articles, and covers the topics of ecological economics, contemporary environmental issues and the media, and global change.

Student Mentorship

Graduate Student Support (4) Dartmouth EEES Program

Pooja Panwar (2021 – present) Doctoral Advisor
Integrating Acoustic Recorders for Wildlife Assessments in Eastern NPS Parks

Miranda Zammarelli (2021 – present) Ph.D. Committee member
Controls on Avian Community Dynamics through Space and Time

Genevieve Goebel (2020 – present) Ph. D. Committee member
Impacts of changing precipitation patterns on the soil carbon cycle in Northeastern forests

Rebecca Finger-Higgins (2018-2020) Ph.D. Committee member

	Ecological Consequences of a warming and drying tundra in West Greenland
Undergraduate Student Support Women in Science Program (4)	Laurella Marin '25, Meghan Kulasingham-Poon '25, Emma Hazard '22, Vanessa Pinney '21
UGAR Fellowship (5)	Annabelle Gerber '24, Zoe Moon '24, Soleil Gaylord '22, Shannon Sartain '21, Hannah Rubin '20
E.E. Just Fellowship (1)	Rafael Rosas '21

In the Press

E. N. Dethier, S. L. Sartain*, **D. A. Lutz**. 2019. Heightened levels and seasonal inversion of riverine suspended sediment in a tropical biodiversity hot spot due to artisanal gold mining. *Proceedings of the National Academy of Sciences*. 116(48): 23936-23941.

1. Mercury-Based Gold Mining Haunts Peruvian Rain Forests. EOS. December 15th, 2021. <https://eos.org/articles/mercury-based-gold-mining-haunts-peruvian-rain-forests>
2. Interventions against illegal mining in Peru narrowly effective. Mining.Com. December 16th, 2021. <https://www.mining.com/interventions-against-illegal-mining-in-peru-narrowly-effective/>
3. Women in Science Project Opens Door to Top Journal Publication. Dartmouth News, November 26th, 2019. <https://news.dartmouth.edu/news/2019/11/women-science-project-opens-door-top-journal-publication>
4. 'Like a bomb going off': why Brazil's largest reserve is facing destruction. The Guardian, January 13th, 2020. <https://www.theguardian.com/environment/2020/jan/13/like-a-bomb-going-off-why-brazils-largest-reserve-is-facing-destruction-aoe>
5. Pictures from outer space reveal the extent of illegal gold mining in Peru. The Conversation, May 6th, 2021. <https://theconversation.com/pictures-from-outer-space-reveal-the-extent-of-illegal-gold-mining-in-peru-159416>

Rapp, J. M., **Lutz, D. A.**, Huish, R. D., Dufour, B., Ahmed, S., Morelli, T. L., and Stinson, K. A. 2019. Finding the sweet spot: Shifting optimal climate for maple syrup production in North America. *Forest Ecology and Management*, 448(15). 187-197.

1. "Maple syrup season may shift, shorten because of climate change". Michigan Live. April 1st, 2022. <https://www.mlive.com/public-interest/2022/04/maple-syrup-season-may-shift-shorten-because-of-climate-change.html>
2. "Climate Change Research: By Century's End, Expect Much Earlier Maple Season" Vermont Public Radio, October 1st, 2019. <https://www.vpr.org/post/climate-change-research-century-s-end-expect-much-earlier-maple-season#stream/0>
3. "Climate Change is Ruining Maple Syrup by Making it Less Sweet and Affecting When we Tap It" Forbes. September 20th, 2019. <https://www.forbes.com/sites/priyashukla/2019/09/20/climate-change-is-ruining-maple-syrup-by-making-it-less-sweet-and-affecting-when-we-tap-it/#6ed8c0e17775>
4. "Maple Syrup Season May Start One Month Early by the Year 2100, According to a New Study" Martha Stewart.com, September 23rd, 2019. <https://www.marthastewart.com/2139089/maple-syrup-season-starting-early-according-to-new-study>

5. “Don’t take Vermont syrup for granted: Here’s how climate change could impact your maple” Burlington Free Press. October 10th, 2019. <https://www.burlingtonfreepress.com/story/news/local/2019/10/10/study-outlines-how-climate-change-affects-vermont-maple-syrup/3927986002/>
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