Andrew J. Elmore

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I. Education

1997	B. Sc., Purdue University, Applied Physics
1999	M. Sc., Brown University, Geological Sciences
2003	Ph. D., Brown University, Geological Sciences

II. Professional Experience

2003-2004	Postdoctoral Research Associate, Carnegie Institution for Science, Stanford, CA
2004-2005	Senior Research Associate, Dartmouth College, Hanover, NH
2005-2006	Research Assistant Professor, Dartmouth College, Hanover, NH
2006-2012	Assistant Professor, UMCES Appalachian Laboratory, Frostburg, MD
2012-2018	Associate Professor, UMCES Appalachian Laboratory, Frostburg, MD
2015	Visiting Scientist, University of Melbourne, Melbourne, Victoria
2018-2021	Senior Scholar, National Socio-Environmental Synthesis Center, Annapolis, MD
2018-present	Professor, UMCES Appalachian Laboratory, Frostburg, MD

III. Honors

University System of Maryland Board of Regents Faculty Award for Research, 2014

Outstanding Alumnus Award, Purdue University, 2015

IV. Research

A. Area of professional expertise

I am drawn to research and science applications that examine spatial and temporal patterns of land use and ecological response to climate change, including forest health, production of food, urban expansion, and other influences the conservation of natural resources. I study biodiversity and biogeochemical processes in these contexts, and apply an array of tools in my work, including geospatial analysis, remote sensing, and isotopic systems.

B. Publications

ISI Citations: http://www.researcherid.com/rid/D-4341-2012

1. Peer-reviewed publications

(*Underlined names indicate student or postdoctoral author at the time of manuscript development)*

Atkins, JW, J Costanza, KM Dahlin, MP Dannenberg, AJ Elmore, MC Fitzpatrick, CR Hakkenberg, BS Hardiman, A Kamoski, EA LaRue, CA Silva, AEL Stovall, EK Tielens (2023) Scale dependency of lidar-derived forest structural diversity. *Methods in Ecology and Evolution* https://doi.org/10.1111/2041-210X.14040

Swanwick, RH, QD Read, SM Guinn, MA Williamson, KL Hondula and AJ Elmore (2022) Dasymetric population mapping based on US census data and 30-m gridded estimates of impervious surface. *Sci Data* **9**, 523. https://doi.org/10.1038/s41597-022-01603-z

Izaya Numata, AJ Elmore, MA Cochrane, C Wang, J Zhao and X Zhang (2022) Deforestation, plantation-related land cover dynamics and oil palm age-structure change during 1990–2020 in Riau Province, Indonesia. *Environmental Research Letters* **17** 094024

Wang, C, AJ Elmore, I Numata, MA Cochrane, L Shaogang, J Huang, Y Zhao, Y Li. (2022) Factors affecting relative height and ground elevation estimations of GEDI among forest types across the conterminous USA. *GIScience & Remote Sensing*, 59:1, 975-999, DOI: 10.1080/15481603.2022.2085354

Wang, C, AJ Elmore, I Numata, MA Cochrane, S Lei, CR Hakkenberg, Y Li, Y Zhao, YA Tian (2022) Framework for Improving Wall-to-Wall Canopy Height Mapping by Integrating GEDI LiDAR. *Remote Sensing* 14, 3618. https://doi.org/10.3390/rs14153618

Mason, RE, JM Craine, NK Lany, M Jonard, SV Ollinger, PM Groffman, RW Fulweiler, J Angerer, QD Read, PB Reich, PH Templer, AJ Elmore. (2022) Explanations for nitrogen decline - Response. *Science* 376:6598

Mason, RE, JM Craine , NK Lany, M Jonard, SV Ollinger, PM Groffman, RW Fulweiler, J Angerer, QD Read, PB Reich, PH Templer, AJ Elmore. 2022. Evidence, causes, and consequences of declining nitrogen availability in terrestrial ecosystems. *Science* 376:6590

Zhao, J, JSH Lee, AJ Elmore, YA Fatimah, I Numata, X Zhang, MA Cochrane. 2022. Spatial patterns and drivers of smallholder oil palm expansion within peat swamp forests of Riau, Indonesia. *Environmental Research Letters* 17: 044015

Ordway, EM, AJ Elmore, S Kolstoe, JE Quinn, R Swanwick, M Cattau, D Taillie, SM Guinn, KD Chadwick, JW Atkins, RE Blake, M Chapman, K Cobourn, T Goulden, MR Helmus, K Hondula, C Hritz, J Jensen, JP Julian, Y Kuwayama, V Lulla, D O'Leary, DR Nelson, JP Ocon, S Pau, GE Ponce-Campos, C Portillo- Quintero, NG Pricope, RG Rivero, L Schneider, M Steele, MG Tulbure, MA Williamson, and C Wilson. 2021. Leveraging the NEON Airborne Observation Platform for socio-environmental systems research. *Ecosphere* 12(6): e03640. 10.1002/ecs2.3640

Hood RR, Shenk GW, Dixon RL, Smith SM, Ball WP, Bash JO, Batiuk R, Boomer K, Brady DC, Cerco C, Claggett P, de Mutsert K, Easton ZM, Elmore AJ, Friedrichs MAM, Harris LA, Ihde TF, Lacher L, Li L, Linker LC, Miller A, Moriarty J, Noe GB, Onyullo GE, Rose K, Skalak K, Tian R, Veith TL, Wainger L, Weller D, and Zhang UJ. (2021) The Chesapeake Bay program modeling system: Overview and recommendations for future development. *Ecological Modelling* 456:109635.

Kaste, JM, P Volante, and AJ Elmore (2021) Bomb 137Cs in modern honey reveals a regional soil control on pollutant cycling by plants. *Nature Communications* 12:1937

Ding, Haiyong, Luming Xu, AJ Elmore, and Yuli Shi (2020) Vegetation phenology influenced by rapid urbanization of the Yangtze Delta Region. *Remote Sensing* 12(11): 1783

Sabo, RD, AJ Elmore, DM Nelson, CM Clark, T Fisher, and KN Eshleman (2020) Positive correlation between wood $\delta^{15}N$ and stream nitrate concentrations in two temperate deciduous forests. *Environmental Research Communications* 2:025003

Lott, CA, ME Akresh, AJ Elmore, CJ Fiss, MC Fitzpatrick, CJ Joos, DI King, DJ McNeil, SH Stoleson, JL Larkin (2019) What evidence exists for landbird species-environment relationships in eastern temperate and boreal forests of North America? A systematic map protocol. *Environmental Evidence* 8:31

Craine, JM, AJ Elmore, L Wang, P Boeckx, S Delzon, Y Fang, A Gray, R Guerrieri, MJ Gundale, P Hietz, DM Nelson, PL Peri, PH Templer, and C Werner (2019) Reply to: Data do not support large-scale oligotrophication of terrestrial ecosystems. *Nature Ecology & Evolution*.

Wang, C, S Lei, AJ Elmore, D Jia, and S Mu (2019) Integrating Temporal Evolution with Cellular Automata for Simulating Land Cover Change. *Remote Sensing* 11:301

Gougherty, A, S Keller, A Kruger, C Stylinski, AJ Elmore, MC Fitzpatrick (*2018*) Estimating tree phenology from high frequency tree movement data. *Agricultural and Forest Meteorology* 263:217-224

Craine, JM, Elmore, AJ, L Wang, J Aranibar, M Bauters, P Boeckx, BE Crowley, MA Dawes, S Delzon, A Fajardo, Y Fang, L Fujiyoshi, A Gray, R Guerrieri, MJ.Gundale, DJ Hawke, P Hietz, M Jonard, E Kearsley, T Kenzo, M Makarov, S Marañón-Jiménez, T. P. McGlynn, BE McNeil, SG Mosher, DM Nelson, PL Peri, JC Roggy, R Sanders-DeMott, M Song, P Szpak, PH Templer, D Van der Colff, C Werner, X Xu, Y Yang, G Yu, and K Zmudczynska-Skarbek (*2018*) Isotopic evidence for oligotrophication of terrestrial ecosystems. *Nature Ecology & Evolution* **2**:1735–1744

Reaves, VC, AJ Elmore, DM Nelson, BE McNeil (2018) Drivers of spatial variability in greendown within an oak-hickory forested landscape. *Remote Sensing of Environment* 210:422-433

Johnston, MR, AJ Elmore, K Mokany, M Lisk, Fitzpatrick, MC (*2017*) Field-measured variables outperform derived alternatives in Maryland stream biodiversity models. *Diversity and Distributions* 23:1054-1066

McLauchlan, KK, LM Gerhart, JJ Battles, JM Craine, AJ Elmore, PE Higuera, MC Mack, BE McNeil, DM Nelson, N Pederson, SS Perakis (*2017*) Centennial-scale reductions in nitrogen availability in temperate forests of the United States. *Scientific Reports* 7:7856

Elmore, AJ, Craine, JM, Nelson, DM, Guinn, SM (*2017*) Continental scale variability of foliar nitrogen and carbon isotopes in *Populus balsamifera* and their relationships with climate. *Scientific Reports* 7:7759

Craine, JM, AJ Elmore, J Angerer (2017) Long-term declines in dietary nutritional quality for North American cattle. *Environmental Research Letters* 12:044019

Weitzell, RE, SS Kaushal, LM Lynch, SM Guinn, and AJ Elmore (2016) Extent of stream burial and relationships to watershed area, topography, and impervious surface area. *Water* 8(538):1-22

Cadol, D, AJ Elmore, SM Guinn, KAM Engelhardt, G Sanders (2016) Modeled tradeoffs between developed land protection and tidal habitat maintenance during rising sea levels. *PlosONE* 11(10): e0164875

Craine, JM, JP Angerer, AJ Elmore, N Fierer (2016) Continental-scale patterns reveal potential for warming-induced shifts in cattle diet. PlosONE 11(8):e0161511

Elmore, AJ, DM Nelson, JM Craine (2016) Earlier springs are causing reduced nitrogen availability in North American eastern deciduous forests *Nature Plants **2**:16133*

Elmore, AJ, C Stylinski, K Prahdan (2016) Synergistic use of citizen science and remote sensing for continental-scale measurements of forest tree phenology. *Remote Sensing* 8(502):1-16

Kaste, JM AJ Elmore, KR Vest, and GS Okin (2016) Groundwater controls on episodic soil erosion and dust emissions in a desert ecosystem. *Geology. 44:771-774.*

Elmore, AJ, KAM Engelhardt, D Cadol, CM Palinkas (2016) Spatial patterns of plant litter in a tidal freshwater marsh and implications for marsh persistence. *Ecological Applications.* 26(3):848-860.

Gutrich, J, K Gigliello, KR Vest, and AJ Elmore (2016) Economic returns of groundwater management sustaining an ecosystem service of dust suppression by alkali meadow in Owens Valley, California. *Ecological Economics.* 121:1-11

Ding, H and AJ Elmore (2015) Spatio-temporal patterns in water surface temperature from Landsat time series data in the Chesapeake Bay, U.S.A. *Remote sensing of Environment* 168:335-348

Craine, JM, AJ Elmore, L Wang, L Augusto, WT Baisden, ENJ Brookshire, MD Cramer, NJ Hasselquist, EA Hobbie, A Kahmen, K Koba, JM Kranabetter, MC Mack, E Marin-Spiotta, JR Mayor, KK McLauchlan, A Michelsen, GB Nardoto, RS Oliveira, SS Perakis, PL Peri, CA Quesada, A Richter, LA Schipper, BA Stevenson, BL Turner, RAG Viani, W Wanek and B Zeller (2015). Convergence of soil nitrogen isotopes across global climate gradients. *Scientific Reports* 5: 8280.

Craine, JM, EG Towne, AJ Elmore (2015) Intra-annual bison body mass trajectories in a tallgrass prairie. *Mammal Research* 60(3):263-270.

Gardner, RH, KAM Engelhardt, AJ Elmore, D Cadol (2014) A traits-based model of species diversity. *Ecological Modelling*, 288:178-194

Cadol, D, KAM Engelhardt, AJ Elmore, G Sanders (*2014*) Elevation-dependent surface elevation gain in a tidal freshwater marsh. *Limnology and Oceanography*, 59(3):1065-1080

Elmore, AJ, JP Julian, SM Guinn, MC Fitzpatrick (*2013*) Potential stream density in mid-Atlantic U.S. watersheds. *PLOS One,* 8(8):e74819:1-15

Vest, KR, AJ Elmore, JM Kaste, GS Okin, Junran Li (*2013*) Estimating Total Horizontal Flux within shrub-invaded groundwater dependent meadows using empirical and mechanistic models. *JGR-Earth Surface,* 118:1132-1146

Craine, JM, N Fierer, KK McLauchlan, and AJ Elmore. (*2013*) Reduction of the temperature sensitivity of soil organic matter decomposition with sustained temperature increase. *Biogeochemistry*, 113(1-3):359-368

Julian, JP, AJ Elmore, SM Guinn. (*2012*) A physiographic analysis of channel head locations along a mountains to sea continuum in the Mid-Atlantic United States. *Geomorphology,* 177-178: 194-203.

Suarez-Rubio, M, TR Lookingbill, and AJ Elmore. (*2012*) Exurban development derived from Landsat from 1986 to 2009 surrounding the District of Columbia, USA. *Remote Sensing of Environment*, 124:360-370

Craine, JM, JB Nippert, AJ Elmore, AM Skibbe, SL Hutchinson, and NA Brunsell. (2012) The timing of climate variability and grassland productivity. *Proceedings of the National Academy of Sciences of the United States of America,* 109:3401-3405.

Elmore, AJ, SM Guinn, BJ Minsley, and AD Richardson. (2012) Landscape controls on the timing of spring, autumn, and growing season length in mid-Atlantic forests. *Global Change Biology,* 18(2):656-674

Elmore, AJ and JM Craine (2011) Spectroscopic analysis of canopy nitrogen and nitrogen isotopes in managed pastures and hay land. *Transactions on Geoscience and Remote Sensing,* 49(7):2491-2498

Kaste, JM, AJ Elmore, K Vest, GS Okin. (2011) Cosmogenic Be-7 in surface soils along an arid precipitation gradient in Owens Valley, CA. *Geophysical Research Letters,* 38, L09401, doi:10.1029/2011GL047242

Elmore, AJ and SM Guinn (2010) Synergistic use of Landsat Multispectral Scanner with GIRAS land-cover data to retrieve impervious surface area for the Potomac River Basin in 1975. *Remote Sensing of Environment,* 114:2384-2391

Lookingbill, TR, AJ Elmore, KAM Engelhardt, JB Churchill, JE Gates, JB Johnson (2010) Influence of wetland networks on bat activity in mixed-use landscapes. *Biological Conservation,* 143(4):974-983

Craine, JM, AJ Elmore, KC Olson, and D Tolleson (2010) Climate change and nutritional stress in grazers. *Global Change Biology*, 16:2901-2911

Lookingbill, TR, SS Kaushal, AJ Elmore, R Gardner, KN Eshleman, RH Hilderbrand, RP Morgan, WR Boynton, MA Palmer and WC Dennison (2009) Altered Ecological Flows Blur Boundaries in Urbanizing Watersheds. *Ecology and Society* 14 (2): 10. [online] URL: http://www.ecologyandsociety.org/vol14/iss2/art10/

Craine, JM, AJ Elmore, MPM Aidar, M Bustamante, TE Dawson, EA Hobbie, A Kahmen, MC Mack, KK McLauchlan, A Michelsen, GB Nardoto, LH Pardo, J Peñuelas, PB Reich, EAG Schuur, WD Stock, PH Templer, RA Virginia, JM Welker, and IJ Wright. (2009) Global patterns of foliar nitrogen isotopes and their relationships with climate, mycorrhizal fungi, foliar nutrient concentrations, and nitrogen availability. *New Phytologist* 183:980-992.

Elmore, AJ, JM Kaste, GS Okin, and MS Fantle (2008) Groundwater influences on atmospheric dust generation in deserts. *Journal of Arid Environments,* 72:1753-1765

Elmore, AJ and SS Kaushal (2008) Disappearing headwaters: Patterns of stream burial due to urbanization. *Frontiers in Ecology and the Environment,* 6(6):308–312, doi:10.1890/070101

Elmore, AJ, Xun Shi, NJ Gorence, Xia Li, Haiming Jin, Fang Wang, Xiaohao Zhang (2008) The spatial distribution of agricultural residue from rice for potential biofuel production in China. *Biomass and Bioenergy,* 32:22-27

Xun Shi, AJ Elmore, Xia Li, NJ Gorence, Haiming Jin, Xiaohao Zhang, Fang Wang (2008) Using Spatial Information Technologies to Select Sites for Biomass Power Plants: A Case Study in Guangdong, China. *Biomass and Bioenergy,* 32:35-43

McLauchlan, KK, AJ Elmore, WW Oswald, and S Sugita (2007) Detecting open vegetation in a forested landscape: pollen and remote sensing data from New England, USA. *The Holocene* 17(8):1233-1243

Craine, JM, J Battersby, AJ Elmore, and AW Jones (*2007*) Building EDENs: the rise of Environmentally Distributed Ecological Networks. *Bioscience,* 57(1):45-54

Elmore, AJ and GP Asner (*2006*) Effects of deforestation and grazing intensity on soil carbon stocks of Hawaiian dry tropical forests. *Global Change Biology,* 12:1761-1772

Elmore, AJ, SJ Manning, JF Mustard, and JS Craine (2006) Decline in alkali meadow vegetation cover in California: the effects of groundwater extraction and drought. *Journal of Applied Ecology,* 43:770-779

Elmore, AJ, JF Mustard, SP Hamburg, and SJ Manning (2006) Agricultural legacies in the Great Basin alter vegetation cover, composition, and response to precipitation. *Ecosystems*, 9:1231-1241

Elmore, AJ, GP Asner, and RF Hughes (2005) Satellite monitoring of vegetation phenology and fire fuel conditions in Hawaiian drylands. *Earth Interactions*, 9(21):1-21

Asner, GP, AJ Elmore, RF Hughes, AS Warner, and PM Vitousek (2005) Ecosystem structure along bioclimatic gradients in Hawai'i from imaging spectroscopy. *Remote Sensing of Environment* 96:497-508

Asner, GP, AJ Elmore, RE Martin, and LP Olander (2004) Grazing systems, Ecosystem Responses, and Global Change. *Annual Review of Environment and Resources*, 29:11.1-11.39

Elmore, AJ and JF Mustard (2003) The Precision and Accuracy of Earth Observing-1 Advanced Land Imager (ALI) Data for Semiarid Vegetation Studies. *IEEE Transactions on Geoscience and Remote Sensing* 41(6):1311-1320.

Elmore, AJ, JF Mustard, and SJ Manning (2003) Regional Patterns of Great Basin Community Response to Changes in Water Resources. *Ecological Applications* 13(2):443-460.

Elmore, AJ, JF Mustard, SJ Manning, and DB Lobell (2000) Quantifying Vegetation Change in Semiarid Environments: Precision and Accuracy of Spectral Mixture Analysis and the Normalized Difference Vegetation Index. *Remote Sensing of Environment* 73:86-102.

2. Conference Proceedings

Lookingbill, T, KAM Engelhardt, AJ Elmore, S Tessel, and JB Churchill. 2010. A wetland inventory and connectivity assessment for Harpers Ferry National Historical Park. *Proceedings of the 2009 George Wright Society Conference*.

Elmore, AJ and JF Mustard (2002) Precision and Accuracy of Earth Observing-1 Advanced Land Imager (ALI) Data for Semiarid Vegetation Studies, *International Geosciences and Remote Sensing Symposium*.

Elmore, AJ, JF Mustard, SJ Manning, and DB Lobell (1999) Precision and Accuracy of Remotely Sensed Data for Quantitative Analysis of Vegetation Change in a Semiarid Region. *Proceedings of the International Symposium on Digital Earth*, Science Press, Beijing, China, Pp. 346-353

3. Reports

Hall, FG, SJ Goetz, AJ Elmore, A Hansen, K Davis, T Hilker, et al. (2015) TECLUB: Terrestrial Ecosystems, Carbon Cycle, Land Use Land Cover Change, and Biodiversity Measurement Requirements for the Next Decade. NASA Technical Report. 53pgs. https://cce.nasa.gov/cce/pdfs/TECLUB_Final_Report.pdf

Elmore, AJ, D Cadol, SM Guinn, GM Sanders, KAM Engelhardt, and MC Fitzpatrick. 2015. Spatially Explicit Modeling of Coastal Vegetation Change Associated with Projected Sea

Level Rise: The Potomac Estuary. *Natural Resource Data Series* NPS/NCRN/NRR—2015/1034. National Park Service, Fort Collins, Colorado.

Elmore, A. J., S. M. Guinn, and G. Sanders (2013) Vegetation structure within the National Capital Region Network using LiDAR data and analysis: Prince William Forest Park, Catoctin Mountain Park, C & O Canal National Historical Park, and Harpers Ferry National Historical Park. Natural Resource Data Series NPS/NCRN/NRDS—2013/XXX. National Park Service, Fort Collins, Colorado.

Eshleman, KN, and AJ Elmore (2013) Recommended best management practices for Marcellus shale gas development in Maryland. Final report to Maryland Department of the Environment, 172 pp.

Litwin, RJ, JP Smoot, MP Pavich, HW Markewich, E Oberg, B Helwig, B Steury, VL Santucci, NJ Durika, NB Rybicki, KAM Engelhardt, G Sanders, S Verardo, AJ Elmore, and J Gilmer (2011) Analysis of the deconstruction of Dyke Marsh, George Washington Memorial Parkway, Virginia: Progression, Geologic and Manmade Causes, and Effective Restoration Scenarios: U.S. Geological Survey Open-File Report 2010-1269, 80p. Technical TS-619-11

Engelhardt, KAM, AJ Elmore, and K Hopfensperger (2008) Sea level rise at Dyke Marsh Preserve: Potential consequences to vegetation and ecosystem processes, Pages 1-31. McLean, NPS Technical TS-572-08

Tessel, S, TR Lookingbill, KAM Engelhardt, AJ Elmore, JB Churchill (2007) Enhanced wetland inventory for Harpers Ferry National Historical Park, (Final Report) Technical TS-538-07

C. Contracts and Grants

0. Submitted

National Science Foundation, Division of Environmental Biology ($500,000) 2023-2026. Informed conservation planning to restore and sustain viable populations of migratory birds and their habitats in the Appalachian Mountains region. PI: Emily Cohen; CoI: Andrew J Elmore, Matt Fitzpatrick

Foundation for Food and Agriculture Research ($475,321) 2023-2025 Targeted Lands, Tailored Engagement: A Socio-Ecological Systems Approach to Conservation Engagement. PI: Matt Houser; CoI: Andrew J Elmore, and many others at The Nature Conservancy

1. Awarded

National Aeronautics and Space Administration, Biodiversity Program ($749,641) 2022-2025. Integrating remote sensing and biodiversity observations to map and monitor plant taxonomic, phylogenetic, and functional beta-diversity in the Greater Cape Floristic Region. PI: Matt Fitzpatrick; CoI: AJ Elmore, Daniel Spalink.

National Science Foundation, Division of Environmental Biology ($500,000) 2021-2026. RCN: Patterns, Places, People: A Network for Scalable Airborne Observation of Socio-Environmental Systems. PI: Andrew Elmore; CoI: E Ordway, D Nelson, M Williamson, and M Steele.

National Science Foundation, Division of Environmental Biology ($69,912) 2021-2024. Collaborative Research: MSA: Tree crown economics: testing and scaling a functional trait-based theory. Institutional PI: Andrew Elmore; Project PI: Brenden McNeil, West Virginia University (budgeted separately).

National Aeronautics and Space Administration, Land Cover and Land Use Change Grant ($749,641) 2020-2023. Land-use transitions in Indonesian peatlands. PI: Mark Cochrane; CoI: AJ Elmore, Xin Zhang.

Natural Resource Conservation Service, 2018-2022 ($500,000) Title: “Spatial analyses and modeling to inform management priorities for working forests in the eastern U.S.” PI: J Larkin; CoIs: AJ Elmore, MC Fitzpatrick, C Lott

National Park Service, 2017-2018 ($35,000) Title: “Conduct geospatial analyses to assess habitat connectivity throughout the length of C&O Canal NHP” PI: AJ Elmore; CoI: MC Fitzpatrick

USFWS through the Wildlife Management Institute, 2017 ($60,645) Title: “Scoping the Appalachian Land Conservation Cooperative Report Card” PI: EA Davidson; CoIs: W Dennison, AJ Elmore, H Kelsey

National Park Service, 2017-2021 ($95,482) Title: “Dendroecological analysis of dominant tree species at NCRN forest monitoring plots: wood production and canopy responses to climate variability” PI: AJ Elmore; CoIs: S Brosi, J Foster, E Matthews, and JP Schmit

National Aeronautics and Space Administration, Applied Science Program, 2017-2020 ($518,385), “Managing forests for sustainable harvest and wildlife habitat using earth observations and modeling of forest structure and landscape connectivity” PI: AJ Elmore; CoI: Matthew C Fitzpatrick, Jeff Larkin, Collin M Shephard, and Joesph Petroski

National Oceanic Atmospheric Administration, B-WET, 2014-2017 ($240,249) “Watershed Research Investigations: A student-teacher-scientist partnership to support healthy streams” PI: C Stylinski; CoI: D Nelson, AJ Elmore

National Fish and Wildlife Foundation, 2013-2014 ($164,789) “Targeting effective forest BMPs in Potomac River watersheds.” PI: K Eshleman; CoI: AJ Elmore

National Science Foundation, Plant Genomics Research Program, 2013-2016 ($1,611,180), “The genomic basis for adaptation to warmer, earlier growing seasons in balsam poplar: synergistic use of genome scans, remote sensing of phenology, and geospatial modeling.” PI: S Keller; CoIs: AJ Elmore, MC Fitzpatrick, D Nelson, and C Stylinski.

National Aeronautics and Space Administration, Terrestrial Ecology Program, 2013-2015 ($653,018), “Assessing the influence of local phenology on the response of forest productivity to changes in growing season length” PI: AJ Elmore; CoI: D Nelson

NOAA Maryland Sea Grant, 2012-2014 ($154,040), “Modeling the role of stream burial and landscape connectivity on aquatic community composition and sensitivity to climate and land-use change” PI: MC Fitzpatrick; CoI: AJ Elmore

National Park Service, 2010-2015 ($423,000) Title: “Modeling Coastal Vulnerability for Tidal Reaches of the Potomac and Anacostia Rivers” PI: AJ Elmore; CoIs: MC Fitzpatrick, KAM Engelhardt, G Sanders

National Science Foundation, 2010-2011 ($17,500) Title: “ROA Supplement: Cost-Effective Economic Analysis of Restoration of Native Alkali Meadow Communities in Owens Valley, California” PI: AJ Elmore; CoI: J Gutrich

National Science Foundation, MRI, 2010-2011 ($434,273) Title: “MRI-R2: Acquisition of a Shared Isotope Ratio Mass Spectrometer for Ecological, Geological & Hydrological Research, Education & Training in the Central Appalachians” PI: D Nelson; CoIs: AJ Elmore and K Eshleman.

National Park Service, 2009-2012 ($108,319) Title: “Vegetation Structure at Prince William Forest Park, Catoctin Mountain Park, and Dyke Marsh Wildlife Preserve: LiDAR Acquisition and Analysis” PI: AJ Elmore; CoI: KAM Engelhardt

National Science Foundation, Ecology, 2009-2012 ($680,000) Title: “The role of sediments in the maintenance of biodiversity in freshwater marshes: implications for global environmental change” PI: KAM Engelhardt; CoIs: AJ Elmore, RH Gardner, C Palinkas.

NOAA Maryland Sea Grant, 2009-2011 ($148,000) Title: “Investigating impacts of headwater stream burial during development on downstream nutrient export to Chesapeake Bay” PI: AJ Elmore; CoIs: JP Julian and S Kaushal.

National Science Foundation, Geomorphology and Land-use Dynamics, 2007-2010 ($241,176 to UMCES; $433,746 total) Title: “Collaborative Research: Quantifying feedbacks between groundwater decline, wind erosion, and ecological change in desert vegetation” PI: AJ Elmore; CoI: GS Okin ($43,449) and J Kaste ($149,121)

National Parks Service, 2007 ($11,731) Title: “Connectivity Monitoring Proof of Concept Harpers Ferry National Historic Park” PI: TR Lookingbill; CoI: AJ Elmore and KAM Engelhardt

National Parks Service, 2007 ($14,975) Title: "Enhanced Wetland Inventory for Harpers Ferry National Historical Park" PI: TR Lookingbill; CoI: AJ Elmore and KAM Engelhardt

The Nelson A. Rockefeller Center at Dartmouth College, Faculty Research Grant, 2005-2006 ($17,446) Title: “Utilization and Impact of Advanced Biomass Energy Production in China” PI: Xun Shi, Dartmouth College; CoI: AJ Elmore and Haiming Jin

National Aeronautics and Space Administration, Office of Earth Science Terrestrial Hydrology Program, 2004-2005. ($20,487) Title: “The Impact of Water Resource Management on Desert Vegetation in Owens Valley, California” PI: AJ Elmore

Luce Fellowship for International Research in the Environment, 2002. ($16,000) Title: “Land-cover and Land-use Change in Southern Mali and Burkina Faso, Africa”

White Mountain Graduate Fellowship Award, University of California, 1999. ($3,500) Title: “Semi-Arid Plant Community Response to Drought and Land-Use at the Regional Scale”

D. Seminars and conference presentations

1. Invited department seminars

National Socio-Environmental Synthesis Center, Annapolis, MD, October 2018, “From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change.”

North Carolina State University, Center for Geospatial Analytics, Raleigh, NC, May 2018, “From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change.”

University of Maryland, Department of Geography, College Park, MD, October 2017, “From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change.”

Earth Resources Observation and Science (EROS) Center, Sioux Falls, SD, October 2017, “From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change.”

South Dakota State University, Geospatial Science Center of Excellence, October 2017, "From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change."

Boston University, Department of Earth and Environment, May 2017, "From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change."

College of William and Mary, Department of Geology, March 2017, "From the mountains to the sea: New insights into mid-Atlantic forest and stream response to global change."

University of Melbourne, Department of Geography, May 2015, "Groundwater, desert ecosystems, and the global dust cycle."

University of Melbourne, School for Ecosystem and Forest Science, March 2015, "Local to remote sensing perspectives on the timing of spring, autumn, and growing season length in northern deciduous forests"

University of Melbourne, Waterway Ecosystem Research Group, February 2015, "Urban streams: where were they and what has become of them?"

West Virginia University, Department of Wildlife and Fisheries Resources, October 2013, "A river runs under it: Modeling the distribution of streams and stream burial in large river basins."

University of Maryland Baltimore County, Department of Geography, September 2012, "A river runs under it: Modeling the distribution of streams and stream burial in large river basins."

University of Pittsburgh, Department of Geology and Planetary Science, February 2012, "A river runs under it: Modeling the distribution of streams and stream burial in large river basins."

Maryland Department of Natural Resources, MANTA Seminar series, January 2012, "A river runs under it: Modeling the distribution of streams and stream burial in large river basins."

University of Richmond, Geography and the Environment, November 2011, "Water resources, ecosystem functioning, and global change: Linking local and remote sensing of patterns and processes."

University of Maryland, College Park, Department of Geography, May 2008, "Water resource management, groundwater dependent ecosystems, and dust."

Pennsylvania State University, Department of Geosciences, April 2008, "Informing sustainable resource management through quantitative remote sensing of vegetation structure."

University of Maryland Center for Environmental Sciences, Horn Point Laboratory, October 2007, "Water resource management, groundwater dependent ecosystems, and dust."

Integration and Application Network, Chesapeake Bay Program Office, May 2007, "Linking management to ecosystem processes with satellite remote sensing: the case for buried streams in the Gunpowder-Patapsco watershed"

Bryn Mawr College, Department of Geology, February 2007, "Plant community response to changes in water: pursuing sustainable water management in Owens Valley, CA."

Brown University, Environmental Studies Program, October 2006, "Linking remote and local sensing in environmental science: an example from grazing system research."

University of Maryland Center for Environmental Science, Appalachian Laboratory, December 2005, "Plant community response to changes in water: remote sensing applications to sustainable water management in Owens Valley, CA."

Sun Yat-Sen University, Guangdong, China, November 2005. "The spatial distribution of agricultural residue from rice for potential biofuel production in China."

University of California at Davis, Center for Spatial Technologies and Remote Sensing, July 2003, "Regional patterns of plant community response to changes in water: Owens Valley, California."

Dartmouth College, Environmental Studies Program, December 2003, "Plant community response to changes in water: remote sensing applications to sustainable water management in Owens Valley, CA."

2. Invited conference presentations

Elmore, AJ (2016) From the mountains to the sea: New insights into mid-Atlantic forest and stream response to climate change, *International Erosion Control Association*, Annapolis, MD

Elmore, AJ (2016) From mountains to the sea: Satellite remote sensing insights into the impact of urbanization on streams and surface water temperature in Chesapeake Bay, *Atlantic Estuarine Research Society*, Virginia Beach, VA

Elmore, AJ (2014) Modeling the Distribution of Streams in Large River Basins, *Stream biodiversity workshop*, Linthicum, MD

Elmore, AJ (2013) Terrestrial Ecology Research Synthesis on Phenology, Seasonality, and Climate Interactions, *NASA Terrestrial Ecology Program Meeting*, La Jolla, CA

Elmore, AJ (2012) Landscape Ecology in Maryland, *Maryland Environmental Literacy Summit*, Cumberland, MD

Elmore, AJ, SM Guinn, JP Julian, R Weitzell (2011) Headwater stream channel mapping and impact assessment in the mid-Atlantic, USA, *Geological Society of America Northeastern/North-Central Section Meeting*, Pittsburgh, PA.

Elmore, AJ (2007) Patterns of stream burial due to urbanization in the Gunpowder Patapsco Watershed, *Maryland Association of Floodplain and Storm Water Managers*, Annual Meeting, Linthicum, MD.

Elmore, AJ, JF Mustard, S Hamburg, and SJ Manning (2004) Using remote sensing to detect land-use legacies in Owens Valley, CA: Plant Community responses to varying precipitation, *88th Annual Meeting of the Ecological Society of America*.

3. Conference presentations

Jing Zhao, Mark A. Cochrane, Janice Ser Huay S. Lee, Andrew J Elmore, Izaya Numata and Xin Zhang. (2021) Spatial Patterns and Drivers of Smallholder Oil Palm Expansion over Peatswamp Forests in Riau. *2021 Fall Meeting, AGU*, San Francisco, Calif., 13-17 Dec.

Ordway, Elsa, Elmore, AJ, Cattau, ME, et. al. (2021) Patterns, Places, People: Leveraging the NEON Airborne Observation Platform for scalable observation of socio-environmental systems. *2021 Fall Meeting, AGU*, San Francisco, Calif., 13-17 Dec.

Elmore, AJ, Fitzpatrick, MC, Larkin, J, Shephard, C, Petroski, J, Guinn, SM, and Lisk, M. (2018) Enhancing Bird Habitat in Late Successional Forests of the Central Appalachians

by Managing for Structural Complexity. *Annual meeting of the US Regional Association of the International Association for Landscape Ecology.* Chicago, Illinois

Elmore, AJ, Kelsey, H, and Taillie, D (2018) Stressors, Conditions, and Management Responses: An Environmental Report Card for the Tennessee River Basin. *Annual meeting of the US Regional Association of the International Association for Landscape Ecology.* Chicago, Illinois

Elmore, AJ, DM Nelson, SM Guinn, JM Craine (2017) Landscape patterns in the response of North American eastern deciduous forests to an earlier spring inferred from tree rings. *Annual meeting of the US Regional Association of the International Association for Landscape Ecology.* Baltimore, Maryland.

Guinn, SM, AJ Elmore, D Cadol, KAM Engelhardt, MC Fitzpatrick. (2017) Predictions of coastal vegetation change associated with sea level rise. *Annual meeting of the US Regional Association of the International Association for Landscape Ecology.* Baltimore, Maryland.

Weitzell, RE, and AJ Elmore (2017) Connectivity across aquatic networks: impacts of urban-related stream burial on the distribution and network structure of headwater stream systems across the Potomac River Basin, USA *Annual meeting of the US Regional Association of the International Association for Landscape Ecology.* Baltimore, Maryland.

McLauchlan K, L Gerhart, JJ Battles, JM Craine, AJ Elmore, PE Higuera, MC Mack, B E McNeil, DM Nelson, N Pederson, and SS Perakis. (2017) Centennial-scale reductions in nitrogen availability in temperate forests of the United States. *Annual meeting of the American Association of Geographers.* Boston, Massachusetts.

Elmore, AJ, D Nelson, and J Craine (2016) Dendrophenology: Inferring the response of North American eastern deciduous forests to an earlier spring from tree rings. *2016 Fall Meeting, AGU*, San Francisco, Calif., 12-16 Dec.

Elmore, AJ, D Cadol, SM Guinn, GM Sanders, DAM Engelhardt, MC Fitzpatrick (2016) Predictions of coastal vegetation change associated with sea level rise. *Spotlight on National Park Resources in the National Capital Region*, Shepherdstown, WV.

Cunningham, V, AJ Elmore, and D Nelson (2015) Assessing the influence of landscape factors and leaf-level properties on the stability of growing-season canopy greenness in a deciduous forest. *Annual Meeting of the Ecological Society of America*, Baltimore, MD

Elmore, AJ, Cadol, D, Palinkas, C and Engelhardt KAM (2014) Spatial patterns of plant litter and sedimentation in a tidal freshwater marsh and implications for marsh persistence. *2014 Fall Meeting, AGU*, San Francisco, Calif., 15-19 Dec.

Stylinski, C Keller, S, Elmore, AJ, Pradhan, K, Fitzpatrick, M (2014) Scientists and volunteers partner to explore poplar phenology and vulnerability to climate change. *Annual Meeting of the Ecological Society of America*, Sacramento, CA.

Elmore, AJ, SM Guinn, D Cadol, K Engelhardt, MC Fitzpatrick (2012) Modeling coastal vulnerability for tidal reaches of the Potomac and Anacostia rivers. AGU Chapman conference, *Hydrogeomorphic Feedbacks and Sea Level Rise in Tidal Freshwater River Ecosystems*

Engelhardt, K, D Cadol, AJ Elmore, C Palinkas (2012) Linking elevation and vegetation change in tidal freshwater marshes. AGU Chapman conference, *Hydrogeomorphic Feedbacks and Sea Level Rise in Tidal Freshwater River Ecosystems*

Kaste, JM, Evans, G, Elmore, AJ, Vest, KR, Okin, GS (2011) Constraining erosion timescales and magnitudes with multiple fallout radionuclide tracers in Owens Valley, CA, Abstract EP41B-0603 presented at *2011 Fall Meeting, AGU*, San Francisco, Calif., 5-9 Dec.

Vest, KR, Elmore, AJ, Kaste, JM, Okin, GS (2011) Functional connectivity as a possible indicator of desertification in degraded grasslands, Abstract B51A-0383 presented at *2011 Fall Meeting, AGU*, San Francisco, Calif., 5-9 Dec.

Elmore, AJ, Julian, J, Guinn, SM, Weitzell, R, Fitzpatrick, MC (2011) A River Runs Under It: Modeling the Distribution of Streams and Stream Burial in Large River Basins, Abstract B31B-0327 presented at *2011 Fall Meeting, AGU*, San Francisco, Calif., 5-9 Dec.

Cadol, D., A Elmore, K. Engelhardt, C. Palinkas (2011) Vegetation influences on tidal freshwater marsh sedimentation and accretion, Abstract EP52B-04 presented at *2011 Fall Meeting, AGU*, San Francisco, Calif., 5-9 Dec.

Cadol, D., A. Elmore, K. Engelhardt (2011) Using inundation timing to estimate flow resistance through marsh vegetation, 2011 *Biennial Coastal and Estuarine Research Federation Meeting*, Daytona Beach, FL, 6-10 Nov.

Elmore, A. J., K. A. M. Engelhardt, and C. M. Palinkas. Vegetation complexity and plant species richness in a tidal freshwater marsh. *2011 Biennial Coastal and Estuarine Research Federation Meeting*, Daytona Beach, FL, 6-10 Nov.

Palinkas, C. M., K. A. M. Engelhardt, and A. J. Elmore. Spatial variability of marsh sedimentation processes in Dyke Marsh Preserve (VA, USA). *2011 Biennial Coastal and Estuarine Research Federation Meeting*, Daytona Beach, FL, 6-10 Nov.

Vest, KR, AJ Elmore, JM Kaste, and GS Okin (2011) Wind erosion in groundwater dependent vegetation communities, *96th Annual Meeting of the Ecological Society of America*, Austin, TX.

Guinn, SM, AJ Elmore, T Mourad, B Wee, A Collins, D Kirschtel, W Dennison (2011) The Potomac River Basin as a landscape-scale classroom for exploring the future of environmental decisions, *96th Annual Meeting of the Ecological Society of America*, Austin, TX.

Julian, J, AJ Elmore, SM Guinn, MC Fitzpatrick (2011) Where do streams really begin?: An ecoregion perspective in the Mid-Atlantic U.S., *96th Annual Meeting of the Ecological Society of America*, Austin, TX.

Elmore, AJ and Guinn, SM (2011) Fine-grain analyses of landscape controls on average forest phenology for mid-Atlantic forests. *US-International Association for Landscape Ecology*, Annual Meeting, Portland, OR, USA.

Elmore, AJ and SM Guinn (2010) Summer green down in forests as a predictor of the availability of belowground resources and response to global warming. *95th Annual Meeting of the Ecological Society of America*, Pittsburgh, PA

Elmore, AJ and SM Guinn (2009) High-resolution average forest phenology and annual residuals for quantifying the start of spring and summer leaf-area dynamics. *American Geophysical Union, Fall Meeting 2009*, abstract #B43C-0395

Vest, KR, AJ Elmore, GS Okin (2009) Interactions between wind erosion, vegetation structure, and soil stability in groundwater dependent plant communities. *American Geophysical Union, Fall Meeting 2009*, abstract #EP21A-0583

Kaste, JM, AJ Elmore, KR Vest, and GS Okin (2009) Using fallout radionuclides to quantify timescales of soil deflation due to ecological change in Owens Valley, California. *American Geophysical Union, Fall Meeting 2009*, abstract #EP21A-0584

Tollerud, HJ, AJ Elmore, MS Fantle (2009) Mapping composition in dust-producing regions: Extending geochemical measurements over large scales with remote sensing. *American Geophysical Union, Fall Meeting 2009*, abstract #EP21A-0567

Gardner, RH, JP Julian, AJ Elmore, and TR Lookingbill (2008) Assessing the Consequences of Land Use Change in the Upper Potomac. Metropolitan Washington Council of Governments, Potomac Monitoring Forum, Berkeley Springs, WV.

Vest, K, AJ Elmore, GS Okin (2008) Wind Erosion and Vegetation Structure in Groundwater Affected Plant Communities. *American Geophysical Union, Fall Meeting 2008*, abstract #H33B-1010

Elmore, AJ (2008) Patterns of Stream Burial due to urbanization in the mid-Atlantic. *US-International Association for Landscape Ecology*, Annual Meeting, Madison, WI, USA.

Julian, JP, TR Lookingbill, A Elmore, and RH Gardner (2007) Potomac River Ecosystem Project: Basin-scale controls on ecosystem processes. Maryland Water Monitoring Council, 13th Annual Meeting, Baltimore, MD.

Elmore, AJ and S Kaushal (2007) Patterns of stream burial due to urbanization in the Mid-Atlantic, U.S. *Ecological Society of America*, Annual Meeting. Vol. 92

Childs, EP and AJ Elmore (2005) Sonify the Satellites: Auditory Display of Geospatial Data. *Eos Trans. American Geophysical Union*, 86(52), Fall Meeting Suppl., Abstract ED43B-0853

Elmore, AJ, and GP Asner (2003) Effects of Introduced Grasses, Grazing and Fire on Regional Biogeochemistry in Hawaii. *Eos Trans. American Geophysical Union*, 84(46), Fall Meeting Suppl., Abstract B31A-01

Elmore, AJ, SJ Manning, and JF Mustard (2003) From Remote Sensing to Policy: Land-use and Land-cover Change in Owens Valley, California. *American Geophysical Union Chapman Conference on Land-use and Land Cover Change and Ecosystem Interactions*.

Elmore, AJ, S Hamburg, SJ Manning and JF Mustard (2002) Land-use Legacies of Cultivation in the Semi-arid West: a Case Study in Owens Valley, California. *87th Annual Meeting of the Ecological Society of America*. Vol. 86.

Elmore, AJ, JF Mustard, and SJ Manning (2001) Land Cover and Land Use Change in a Water Controlled Environment. *Eos Trans. AGU*, 82 (20), Spring Meet. Suppl., Abstract B31A-10.

Mustard, JF, TR Fisher, SD Prince, AJ Soja, AJ Elmore (2001) The trajectories and impacts of land-use and land-cover change: a global synthesis. *Eos Trans. American Geophysical Union*, 82 (47), Fall Meeting Suppl., Abstract B21A-01.

Elmore, AJ, JF Mustard, and SJ Manning (2000) Semiarid Plant Community Response to Drought and Land-use at the Regional Scale. *85th Annual Meeting of the Ecological Society of America,* Abs. Vol. 85, p.92.

Elmore, AJ, JF Mustard, and SJ Manning (2000) Land Use Intensification of Drought in Semi-Arid Systems: Implications for Land Cover Change. *Eos Trans. American Geophysical Union*, 81 (19), Spring Meet. Suppl., Abstract B22A-04.

Elmore, AJ, JF Mustard, SJ Manning, and DB Lobell (1999) Precision and Accuracy of Remotely Sensed Data for Quantitative Analysis of Vegetation Change in a Semiarid Region. *84th Annual Meeting of the Ecological Society of America,* Abs. Vol. 84, p.82

Elmore, AJ, JF Mustard (1998) Vegetation Response to Climatic and Anthropogenic Forcing Functions in a Semiarid Ecosystem, *Association of American Geographers Abs. Vol.* 94.

Elmore, AJ, and J Harbor (1997) Formation of Table Rocks on Glaciers: Haut Glacier d'Arolla, Switzerland. *Eos Trans. Am. Geophysical Union*, 78, Spring Meet. Suppl., Abstract H52B-07.

V. Teaching and Training

A. Courses Taught by year

Year	Course	Enrollment	Credits
2021*	MEES689x Global Environmental Remote Sensing	7	3
2019*	MEES689x Global Environmental Remote Sensing	8	3
2017*	MEES689x Global Environmental Remote Sensing	6	3
2015	MEES698x Remote Sensing for Environmental Management	8	4
2015*	MEES708k Scientific Basis for a Chesapeake Headwaters Report Card	4	2
2014	MEES699 Terrestrial Ecology	3	2
2013	MEES698x Remote Sensing for Environmental Management	7	4
2011	MEES698x Remote Sensing for Environmental Management	8	4
2009	MEES698x Remote Sensing for Environmental Management	7	4
2008	MEES699 Global Environmental Remote Sensing	5	2
2008	MEES699 Spatial analysis in R	7	1

***Team-taught with one other instructor

B. Course Descriptions

Global Environmental Remote Sensing (3 credits)

- Team-taught in the **MEES program** in Fall of odd years with Greg Silsbe (HPL).
- This course expanded on the previously-taught Remote sensing for environmental management to include more in-depth treatment of ocean color remote sensing. We also developed several assignments that involved coding in R and Google Earth Engine.

Scientific Basis for a Chesapeake Headwaters Report Card (2 credits)

- Team-taught one time as a 2-credit course in the **MEES program** in Fall 2015. Under faculty guidance four students produced an environmental report card for the upper Potomac River watershed.

Terrestrial Ecosystem Ecology (3 credits)

- Taught as a 3-credit course in the **MEES program** in Fall 2014. Using the textbook of the same name by Chapin et al, the course covered terrestrial ecosystem processes and compared these to aquatic systems. The students contributed by leading lectures, identifying additional publications to read with the class, and preparing a final project. The combined final project was formatted as a journal review article that we intend to submit for publication.

Remote Sensing for Environmental Management (4 credits)

- Taught as a four-credit course in **MEES program** since 2009 in the fall of odd years. Covers remote sensing theory and applications pertinent to environmental management. Includes lectures, problem sets, laboratory assignments, and a field trip.

Global Environmental Remote Sensing (2 credits)

- Taught as a seminar in the **MEES program** in Spring 2008. Covered a survey of topics in remote sensing including aquatic and terrestrial, and passive and active remote sensing.

Spatial analysis in R (1 credit)

- Offered as a seminar in the **MEES program** in Fall 2008, this course used various examples found on the web and independently developed from past research experiences to introduce methods of spatial analysis to graduate students.

Land-use and Land-cover Change and Ecosystem Interactions

- Taught two times as a ***Visiting Assistant Professor, Dartmouth College***. The course was structured around two themes: (1) advanced remote sensing techniques of atmospheric removal and quantitative measurements of land surface properties, and (2) a literature review covering modern applications of remote sensing to complex environmental problems such as deforestation, wetland hydrology, and agricultural/forestry science.

Geology and Ecology of Death Valley and Owens Valley, California: a Field Course

- Taught two times, once as a ***Teaching Assistant, Brown University*** and once as a ***Visiting Assistant Professor, Dartmouth College***. The course material covers geomorphology, desert ecology, eco-hydrology, and the ecological impact of water resource management. I use this location as a teaching laboratory for the application of remote sensing and GIS techniques to watershed management.

C. Advising and Mentoring

1. Graduate student adviser for:

Kimberly Vest (PhD, graduated in 2015 from UMCES AL)
Roy Weitzell (PhD, graduated in 2015 from UMCES AL, *EPA-STAR fellowship awardee*)
Vanessa Cunningham Reeves (MSc graduated in 2016 from UMCES AL, jointly advised with David Nelson)
Dylan Taillie (MSc, graduated in 2021 from UMCES AL and IAN, jointly advised with Bill Dennison)

2. Graduate committee member for:

Annie Elmore (MSc, graduated at UMCES AL, 2009)
Marcela Suarez (PhD, graduated at UMCES AL, 2011)
Cara Campbell (PhD, graduated at UMCP)
Robert Sabo (MS, graduated at UMCES AL)
Robert Sabo (PhD, graduated at UMCES AL)
Miriam Johnston (MS, graduated in 2014 at UMCES AL)

Timothy Wynne (PhD, graduated in 2019 at UMCES HPL)
Diana Roman (MS, graduated in 2015 at UMCP)
Steve Epting (MS, graduated in 2015 at UMCP)
Andy Gougherty (PhD, graduated in 2019 at UMCES AL)
Vanessa Vargas (PhD, graduated in 2021 at UMCES IAN)
Stephanie Siemek (PhD, graduated in 2021 at UMCES AL)
Karen Johnson Heeter (MSc, graduated in 2017 at Frostburg State University)
Erica Duda (MSc, graduated in 2020 at Frostburg State University)
Cangjiao Wang (PhD, in progress at China University of Mining and Technology)
Joel Bostic (PhD, in progress at UMCES AL)
Anna Windle (PhD, in progress at UMCES HPL)
Yiting Fan (PhD, in progress at WVU)

3. Postdoctoral mentor for:

Jason Julian, Associate Professor, Texas State University (completed at UMCES AL; with Todd R Lookingbill and Robert H Gardner)
Dan Cadol, Associate Professor, New Mexico School of Mines (completed at UMCES AL; with Katia AM Engelhardt and Matt C Fitzpatrick)
Darin McNeil, Assistant Professor, University of North Carolina Wilmington (completed at SESYNC with Matt C Fitzpatrick)
Jeff Atkins, Research Biologist, USDA Forest Service (completed at SESYNC with Matt C Fitzpatrick)
Izaya Numata, Research Scientists at South Dakota State University
Jing Zhao, in progress at UMCES AL with Xin Zhang
Rachel Mason, Research Scientists, Arizona State University

4. Scientist mentor for high school and middle school teachers:

Erin Green, Biology Teacher, Pikesville High School, Baltimore, MD (completed at UMCES AL, 2009)

VI. Academic and community service

A. Peer Review

Editorial board member, Environmental Research Letters (2016-present)

Adhoc subject editor, Conservation Biology

Peer-reviewer (10-15 manuscripts each year), Ecological Applications, Ecosystems, Global Change Biology, Ecology Letters, Biology Letters, Remote Sensing of Environment, New Phytologist, Transactions on Geoscience and Remote Sensing, Photogrammetric Engineering and Remote Sensing, International Journal of Remote Sensing, International Journal of Climatology, Journal of Applied Geophysics, Earth Surface Processes and Landforms, and Geomorphology

Proposal reviewer, NSF, Geomorphology and Land-use Dynamics, Ecosystems, and Major Research Instrumentation

Peer-review panel participant, NSF, Major Research Instrumentation

Peer-review panel participant, NASA, Terrestrial Ecology

Peer-review panel participant, NASA, Interdisciplinary Science

Peer-review panel participant, NASA, Earth Observing Science

Peer-review panel participant, NASA, Biodiversity and Ecological Forecasting

Peer-review panel participant, NSF, Macrosystems Biology

B. Service to UMCES

UMCES Faculty Senate Chair and CUSF representative, 2021 - 2024

Hiring committee, UMCES Vice President for Finance and Administration, 2022-2023

Hiring committee, UMCES president, *2017*

Hiring committee, Assistant Professor in Ecology, 2017

- *Resulted in the hiring of Mark Cochrane and Tyler Flockhart*

MEES program committee, 2015-present

MEES restructuring committee, 2013-2015

UMCES Accreditation Readiness Team, Workgroup chair, 2013

AL Education committee, 2006-2017 (Chair, 2011-2015)

Graduate Faculty Council, 2013 - 2017

Faculty Senator, 2009 – 2012

Hiring committee, Appalachian Laboratory Director, 2012

Director review committee, Chair, 2011

AL Open house committee, 2010

Hiring committee, Global Climate Change Assistant Professor, 2009

- Resulted in the hiring of Dave Nelson and Matt Fitzpatrick

Hiring committee, Potomac Initiative Postdoc, 2008

- Resulted in the hiring of Jason Julian

Hiring committee, Biogeochemistry Assistant Professor, 2008

Seminar Chair, Spring 2007

Organizer, Faculty retreat, 2007

AL picnic committee, Chair, *2008-2010*

C. Public Service

National Ecological Observatory Network, Community Ambassador, October 2021 - present

*Invited speaker, "*Best Management Practices for Marcellus Shale Gas Development in Maryland", Chesapeake Environmental Protection Association, Annapolis, MD 2014

Invited speaker, "Landscape Ecology in Maryland", Western Maryland Regional Environmental Literacy Group, March 11, 2013

Research highlighted, ParkScience, "The effects of wetland networks distribution on bat activity", Jonathan Nawn, Amy Stevenson, and Jeff Selleck, July 13, 2011

Science educator, Ecological Society of America & NEON, Workshop titled: "Future of Environmental Decisions"*,* November 5-6, 2010

Science educator, Northeast Elementary School, "How to build a working anemometer and use it to measure wind speeds," February 2010

Interviewee, Baltimore Sun, "Underground waterways rush pollution to Chesapeake Bay", by Rona Kobell, February 26, 2008

Invited speaker, Maryland Association of Floodplain and Stormwater Managers (MAFSM), "Patterns of Headwater Stream Burial Due to Urbanization in the Gunpowder-Patapsco watershed", October 2007

Science educator, Connecticut River Festival, Workshop titled: "Rain to Rivers," Norwich Elementary School, Norwich, VT, 2004-2006

Board Member, Cornish Town Forest, Cornish, NH, 2004-2006

Invited public speaker, "Owens Valley from Space Analysis of Vegetation Response to Changes in Water Using Remote Sensing," White Mountain Research Station, Bishop, CA, September 2003

Invited public speaker, "Current research in Owens Valley, the scientific research method, and relevance to education in the public schools of Inyo County, CA," Inyo County Office of Education, Eastern Sierra Watershed Program, July 2003