

Andrew J. Elmore

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Current position:

Assistant Professor
UMCES Appalachian Lab
301 Braddock Road
Frostburg, MD 21532

Education

Brown University; Providence, RI

2003 PhD, Geological Sciences (Advisor: Dr. John F. Mustard)

1999 MSc, Geological Sciences (Advisor: Dr. John F. Mustard)

Purdue University; West Lafayette, IN

1997 BSc with Honors, Applied Physics with a specialty in Geoscience

Publications (peer reviewed)

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, doi:10.1016/j.rse.2010.05.004

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*, doi: 10.1016/j.biocon.2010.01.011

Craine, JM, Elmore, AJ, Olson, KC, and Tolleson, D (2010) Climate change and nutritional stress in grazers. *Global Change Biology*, doi: 10.1111/j.1365-2486.2009.02060.x

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

Elmore, AJ and Kaushal, S (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, Gorence, NJ, 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, Elmore, AJ, Xia Li, Gorence, NJ, 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, Elmore, AJ, Oswald, WW, and Sugita, S. (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, Battersby, J, Elmore, AJ, and Jones, AW (2007) Building EDENs: the rise of Environmentally Distributed Ecological Networks. *Bioscience*, 57(1):45-54
- Elmore, AJ and Asner, GP (2006) Effects of deforestation and grazing intensity on soil carbon stocks of Hawaiian dry tropical forests. *Global Change Biology*, 12:1761-1772
- Elmore, AJ, Manning, SJ, Mustard, JF, and Craine JS (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, Mustard, JF, Hamburg, SP, and Manning, SJ (2006) Agricultural legacies in the Great Basin alter vegetation cover, composition, and response to precipitation. *Ecosystems*, 9:1231-1241
- Elmore, AJ, Asner, GP, and Hughes, RF. (2005) Satellite monitoring of vegetation phenology and fire fuel conditions in Hawaiian drylands. *Earth Interactions*, 9(21):1-21
- Asner, GP, Elmore, AJ, Hughes, RF, Warner, AS, and Vitousek, PM. (2005) Ecosystem structure along bioclimatic gradients in Hawai'i from imaging spectroscopy. *Remote Sensing of Environment* 96:497-508
- Asner, GP, Elmore, AJ, Martin, RE, and Olander, LP. (2004) Grazing systems, Ecosystem Responses, and Global Change. *Annual Review of Environment and Resources*, 29:11.1-11.39
- Elmore, AJ and Mustard, JF (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, Mustard, JF, and Manning, SJ (2003) Regional Patterns of Great Basin Community Response to Changes in Water Resources. *Ecological Applications* 13(2):443-460.
- Elmore, AJ, Mustard, JF, Manning, SJ, and Lobell, DB (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.

Publications (in review)

- Elmore, AJ and Craine, JM. (*in review*) Spectroscopic analysis of canopy nitrogen and nitrogen isotopes in managed pastures and hay land. *IEEE Transactions on Geoscience and Remote Sensing*
- Elmore, AH, Engelhardt, KAM, Elmore, AJ, and Baldwin, AH (*in review*) Remote sensing of tidal freshwater marsh: interactions between elevation, tidal channels, and vegetation structure. *Wetlands*

Professional Experience

Assistant Professor, September 2006 - Present

University of Maryland Center for Environmental Science, Appalachian Lab

Research Assistant Professor, July 2005 – September 2006

Visiting Assistant Professor, March 2004 - September 2006

Senior Research Associate, August 2004 – June 2005

Dartmouth College, Environmental Studies Program, Hanover, NH

Postdoctoral Research Associate, January 2003 – August 2004

Carnegie Institution of Washington, Department of Global Ecology, Stanford, CA

Funding awarded

- National Park Service, 2010-2012 (\$423,000) Title: "Modeling Coastal Vulnerability for Tidal Reaches of the Potomac and Anacostia Rivers" PI: Andrew J. Elmore; CoIs: Matt Fitzpatrick, Katia Engelhardt, Geoff Sanders
- 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: David Nelson; CoIs: Andrew J. Elmore and Keith Eshleman.
- National Park Service, 2009 (\$66,549) Title: "Vegetation Structure at Prince William Forest Park, Catoctin Mountain Park, and Dyke Marsh Wildlife Preserve: LiDAR Acquisition and Analysis" PI: Andrew J Elmore; CoI: Katia 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: Katia Engelhardt; CoIs: Andrew J. Elmore, Robert Gardner, Cindy 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: Elmore; CoIs: Jason Julian and Sujay Kaushal.
- National Science Foundation, Geomorphology and Land-use Dynamics, 2007-2010 (\$223,676) Title: "Collaborative Research: Quantifying feedbacks between groundwater decline, wind erosion, and ecological change in desert vegetation" PI: Elmore; CoI: Greg Okin and James Kaste
- National Parks Service, 2007 (\$11,731) Title: "Connectivity Monitoring Proof of Concept Harpers Ferry National Historic Park" PI: T Lookingbill; CoI: A Elmore and K Engelhardt
- National Parks Service, 2007 (\$14,975) Title: "Enhanced Wetland Inventory for Harpers Ferry National Historical Park" PI: T Lookingbill; CoI: A Elmore and K 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: A 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: A 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"

Conference Proceedings

- Elmore, AJ and JF Mustard (2002) Precision and Accuracy of Earth Observing-1 Advanced Land Imager (ALI) Data for Semiarid Vegetation Studies, *Int. Geo. And Remote Sensing Symposium*.
- Elmore, AJ, Mustard, JF, Manning, SJ, and Lobell, DB (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

Conference Abstracts

- Elmore, AJ and Guinn, SM (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, Elmore, AJ, Okin, GS (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, Elmore, AJ, Vest, KR, and Okin, GS (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, Elmore, AJ, Fantle, MS (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
- Vest, K, Elmore, AJ, Okin, GS (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.
- 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 and Kaushal, S (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 Elmore, AJ (2005) Sonify the Satellites: Auditory Display of Geospatial Data. *Eos Trans. American Geophysical Union*, 86(52), Fall Meeting Suppl., Abstract ED43B-0853
- Elmore, AJ, Mustard, JF, Hamburg, S, and Manning, SJ (2004) Using remote sensing to detect land-use legacies in Owens Valley, CA: Plant Community responses to varying precipitation. *Ecological Society of America*. Annual Meeting. Vol. 88. (Invited)
- Elmore, AJ, and Asner, GP (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, Manning, SJ, and Mustard, JF (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, Hamburg, S, Manning, SJ and Mustard, JF (2002) Land-use Legacies of Cultivation in the Semi-arid West: a Case Study in Owens Valley, California. *Ecological Society of America* Annual Meeting. Vol. 86.
- Elmore, AJ, Mustard, JF, and Manning, SJ (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, Fisher, TR, Prince, SD, Soja, AJ, Elmore, AJ (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, Mustard, JF, and Manning, SJ (2000) Semiarid Plant Community Response to Drought and Land-use at the Regional Scale. *Ecological Society of America Abs.* Vol. 85, p.92.
- Elmore, AJ, Mustard, JF, and Manning, SJ (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, Mustard, JF, Manning, SJ, and Lobell, DB (1999) Precision and Accuracy of Remotely Sensed Data for Quantitative Analysis of Vegetation Change in a Semiarid Region. *Ecological Society of America Abstract Volume* 84, p.82

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

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

Academic and community service

Peer-reviewer: *Ecological Applications, Ecosystems, Global Change Biology, Ecology Letters, Remote Sensing of Environment, Transactions on Geoscience and Remote Sensing, Photogrammetric Engineering and Remote Sensing, International Journal of Remote Sensing, International Journal of Climatology, Journal of Applied Geophysics, New Phytologist, and Geomorphology*

Peer-review panel participant, NASA Interdisciplinary Science, Hydrological processes

Peer-review panel participant, NASA EOS re-competition

Volunteer, Connecticut River Festival, Norwich, VT

- Developed and presented a hydrology workshop for 5th grade students at the Norwich Elementary school titled "Rain to Rivers."

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

Invited lectures and outreach

University of Maryland, College Park, Department of Geography, May 2008

Pennsylvania State University, Department of Geosciences, April 2008

University of Maryland Center for Environmental Sciences, Horn Point Laboratory, October 2007

Bryn Mawr College, Department of Geology, February 2007

Brown University, Environmental Studies Program, October 2006

University of California at Davis, Center for Spatial Technologies and Remote Sensing, July 2003

University of California, White Mountain Research Station, Bishop, CA, September 2003

- Annual lecture series designed to inform the public on scientific research of local interest.

Inyo County Office of Education, Eastern Sierra Watershed Program, July 2003

- Invited to speak on current research in Owens Valley, the scientific research method, and relevance to education in the public schools of Inyo County, CA.

Courses taught

Remote Sensing for Environmental Management

- Taught as a four-credit course in **MEES program** in Fall 2009. Covered remote sensing techniques pertinent to environmental management.

Global Environmental Remote Sensing

- 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

- 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

- 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.

- Taught two times as a *Visiting Assistant Professor, Dartmouth College*

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

- 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.
- Taught two times, once as a *Teaching Assistant, Brown University* and once as a *Visiting Assistant Professor, Dartmouth College*.