

# Michael G. Alonzo

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## APPOINTMENTS

### Current:

Assistant Professor in the Department of Environmental Science (American University, 2017 – present)  
NASA Carbon Monitoring System Science Team  
NASA Arctic Boreal Vulnerability Experiment (ABOVE) Science Team

### Previous:

NASA Postdoctoral Program Fellow (Goddard Space Flight Center, 2015 - 2017)

## EDUCATION

- Ph.D. University of California, Santa Barbara, Department of Geography (September 2015)  
*Research focus:* Urban ecosystem analysis through fusion of hyperspectral imagery and lidar data  
Certificate in College and University Teaching (January 2015)
- M.A. University of Denver, Department of Geography (2007)  
*Thesis:* Rural vs. Rural: An examination of the disparities in access to primary care among Colorado's non-metropolitan communities
- B.A. Middlebury College, Department of Geography (2001)  
*Study abroad:* Universidad de La Serena, Chile (July 1999 – February 2000)

## PUBLICATIONS

Peer reviewed (undergraduate mentee co-author underlined)

- Alonzo, M.**, Dial, R., Schulz, B.K., Lewis-Clark, E., Cook, B.D., & Morton, D.C. (2020) Mapping boreal shrub biomass at landscape scale using lidar and structure from motion. *Remote Sensing of Environment*
- Miller, D., **Alonzo, M.**, Roberts, D.A., Tague, C.L., & McFadden, J.P. (2020) Drought response of urban trees and turfgrass using airborne imaging spectroscopy. *Remote Sensing of Environment* 240, 111646.
- Steger, C., Nigussie, G., **Alonzo, M.**, Warkineh, B., Van Den Hoek, J., Fekadu, M., Evangelista, P., & Klein, J. (2020) Knowledge Co-production to Assess Environmental Change in the Ethiopian Highlands. *Ecology and Society* 25 (2):2.
- Alonzo, M.**, Andersen, H-E., Morton, D.C., & Cook B.D. (2018) Quantifying boreal forest structure and composition using UAV structure from motion. *Forests*. 9(3), 119.
- Babcock, C., Finley, A.O., Andersen, H-E., Pattison, R., Cook, B.D., Morton, D.C., **Alonzo, M.**, Nelson, R., Gregoire, T., Ene, L., Gobbaken, T., Naesset, E. (2018) Geostatistical estimation of forest biomass in interior Alaska combining Landsat-derived tree cover, sampled airborne lidar and field observations. *Remote Sensing of Environment*.
- Alonzo, M.**, Morton, D.C., Cook, B.D., Andersen, H.E., Babcock, C., & Pattison, R. (2017) Patterns of canopy and surface layer consumption in a boreal forest fire from repeat lidar. *Environmental Research Letters*. 12,6.

- Roberts, D.A., **Alonzo, M.**, Weatherly, E., Dennison, P., & Dudley, K. (2017) Multiscale analysis of urban areas using mixing models. Invited book chapter for *Integrating Scale in Remote Sensing and GIS*. Quattrochi, D., Wentz, L., Lam, N., & Emerson, J. (Eds.)
- Alonzo, M.**, Van Den Hoek, J., & Ahmed, N. (2016). Capturing coupled riparian and coastal disturbance from industrial mining using cloud-resilient satellite time series analysis. *Scientific Reports*. 6, 35129; doi: 10.1038/srep35129.
- Jenerette, G.D., Weller Clarke, L., Avolio, M.L., Pataki, D.E., Gillespie, T.W., Pincetl, S., Nowak, D.J., Hutya, L.R., McHale, M., McFadden, J.P., & **Alonzo, M.** (2016) Environmental Filters and Trait Choices Shape Urban Tree Biodiversity. *Global Ecology and Biogeography*.
- Alonzo, M.**, McFadden, J.P., Nowak, D.J., & Roberts, D.A. (2016) Mapping urban forest structure and function using hyperspectral imagery and lidar data. *Urban Forestry & Urban Greening*, 17, 135-147.
- Roth, K.L., Roberts, D.A., Dennison, P., Peterson, S.H., & **Alonzo, M.** (2015) The impact of spatial resolution on the classification of plant species and functional types within imaging spectrometer data. *Remote Sensing of Environment*, 171, 45-57.
- Roth, K.L., Roberts, D.A., Dennison, P.E., **Alonzo, M.**, Peterson, S.H., Beland, M. (2015). Evaluating strategies for discriminating plant species across diverse ecosystems with imaging spectroscopy. *Remote Sensing of Environment*, 167, 135-151.
- Alonzo, M.**, Bookhagen, B., McFadden, J.P., Sun, A., & Roberts, D.A. (2015) Mapping urban forest leaf area index with airborne lidar using penetration metrics and allometry. *Remote Sensing of Environment*, 162, 141-153.
- Alonzo, M.**, Bookhagen, B., & Roberts, D. A. (2014). Urban tree species mapping using hyperspectral and lidar data fusion. *Remote Sensing of Environment*, 148, 70–83.
- Alonzo, M.**, Roth, K., Roberts, D. (2013). Identifying Santa Barbara’s urban tree species from AVIRIS imagery using canonical discriminant analysis. *Remote Sensing Letters*, 4(5), pp. 513-521.

#### Other publications and media

- Konheim, Orinn, “Entering its second year, initiative strives to protect Tidal Basin and its cherry trees ‘at a pivotal moment’”, *The DC Line* (March 24, 2020) <https://thedcline.org/2020/03/24/entering-its-second-year-initiative-strives-to-protect-tidal-basin-and-its-cherry-trees-at-a-pivotal-moment/>
- Watts, Andrea; Andersen, Hans-Erik; Cook, Bruce; **Alonzo, Mike**. 2019. “Innovation in the Interior: How state-of-the-art remote sensing is helping to inventory Alaska’s last frontier”. *Science Findings* 222. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 5 p.
- NBC4 segment, *Researchers Find the Coolest Trees in the District* (June 21, 2019, Washington, DC) [https://www.nbcwashington.com/news/local/researchers-find-the-coolest-trees-in-the-district\\_washington-dc/136846/](https://www.nbcwashington.com/news/local/researchers-find-the-coolest-trees-in-the-district_washington-dc/136846/)
- Howard, H. & **Alonzo, M.** (2010) Improving watershed health and air quality in Washington, DC. *Mapping Forestry*. P. Eredics (Ed.). Redlands, CA: Esri Press.
- Alonzo, M.** (2009) Casey Trees Study: Understanding the Residential Energy Benefits of Trees in the District of Columbia. *City Trees*. May/June 2009

## GRANTS, FELLOWSHIPS, AND AWARDS

### Research grants (funded)

**Principal Investigator**, *Understanding tree species and site controls on urban transpiration using high resolution spatial analyses*, National Science Foundation -- \$416,000 (3 years, 2020 – 2023)

**Co-Investigator**, *NASA-USFS Partnership to Advance Operational Forest Carbon Monitoring in Interior Alaska*, NASA Carbon Monitoring System – AU portion: \$136,000 (3 years, 2020 – 2022).

**Principal Investigator**, *Expanding access to data-intensive remote sensing algorithms through collaboration with the SES research community*. National Socio-Environmental Synthesis Center (SESYNC) – AU portion: \$89,000 (1 year, 2018).

**Principal Investigator**, *Mapping boreal forest structure and composition using fine-scale lidar and hyperspectral data from the G-LiHT Airborne Imager*. Sub-award via NASA Carbon Monitoring System – AU portion: \$123,000 (3 years, 2017 – 2019).

Imagery Grant, GeoEye Foundation (2011)

### Fellowships

NASA Postdoctoral Program Fellowship (2015 – 2017)

EPA-STAR Fellowship (2014) -- \$84,000.

UCSB Graduate Division Dissertation Fellowship (2014) -- \$12,647

Casey Trees Fellow, Garden Club of America Zone VI Fellowship in Urban Forestry (2014) -- \$4,000

Robert N. Colwell Memorial Fellowship (2014) - \$6,000 (American Society for Photogrammetry and Remote Sensing Foundation)

### AU Student advisee fellowships:

Avery Williams (MS '21) - Casey Trees Fellow, Garden Club of America Zone VI Fellowship in Urban Forestry (2019) -- \$5,000

### Awards and Scholarships

Jack Child Teaching with Technology Award -- 2019

Mellon Fund Competition (\$1,900, American University) – 2018

International Association for Urban Climate / American Meteorological Society Student Presentation Award (9<sup>th</sup> International Conference on Urban Climate)

The Jack Estes Memorial Award (\$1,000 for excellence in remote sensing research)

Outstanding Student Paper Award (Biogeosciences) – AGU 2014

Special Achievement in GIS, ESRI Users Conference (2010)

Graduate Student Association Travel Grant -- \$200 (AGU 2014 in San Francisco, CA)

UCSB Graduate Senate Doctoral Student Travel Grant -- \$1030 (ForestSat 2014 in Riva del Garda, Italy)

Dangermond Travel Scholarship - \$1200 (ICUC9 in Toulouse, France)

Dangermond Travel Scholarship - \$500 (AAG 2015 in Chicago, IL)

Dangermond Travel Scholarship - \$600 (AAG 2014 in Tampa, FL)

Dangermond Travel Scholarship - \$500 (AGU 2013 in San Francisco, CA)

Dangermond Travel Scholarship - \$1200 (Riegl Lidar 2013 in Vienna, Austria)

Dangermond Travel Scholarship - \$500 (AAG 2013 in Los Angeles, CA)

Dangermond Travel Scholarship - \$580 (AAG 2012 in New York City, NY)

## TEACHING EXPERIENCE

### Instructor:

ENVS 455/655: Environmental GIS (American University)  
ENVS 485/685: Remote Sensing (American University)  
ENVS 410/610: City and Environment (American University)  
ENVS 250: Living on Earth (American University)  
CORE 105-055: Maxing Out Planet Earth (Complex Problems, American University)  
Introduction to Geographic Information Systems (UCSB)

## SERVICE

### Current/Recent

AU Core: CAS representative on the Habits of Mind/Natural-Scientific Inquiry Committee (2019 - )  
ENVS tenure line and term faculty search committees (2018, 2019)  
Graduate Studies Committee (Dept. Environmental Science., American University, 2018 - )  
Geospatial Working Group (American University, 2017 - )  
Outstanding Student Paper Award Judge at AGU (2017-)  
Coordinator for the AU Environmental Science Honors Program (2017 - )

### Past

SilviLaser Scientific Committee (2017)  
NASA Earth Systems Science Fellowship Panelist (Washington, DC 2017)  
NEON Hackathon: Designing teaching materials for hyperspectral imagery data using R/Python (2015)  
AAG Remote Sensing Specialty Group Awards ad-hoc committee member (2015)  
UCSB-ASPRS Workshop co-organizer / instructor: How to answer science questions with airborne lidar (2015)  
UCSB-ASPRS Workshop co-organizer: Python for Scientific Computing and Image Analysis (2013)  
UCSB-ASPRS Workshop co-organizer: Terrestrial lidar data acquisition, processing, and analysis (2013)  
President UCSB Student chapter of the American Society for Photogrammetry and Remote Sensing (2012-13)

### Peer reviewer for:

*Frontiers in Ecology and Evolution*  
*ISPRS Journal of Photogrammetry and Remote Sensing*  
*Journal of Selected Topics in Applied Earth Observations and Remote Sensing*  
*Remote Sensing*  
*Remote Sensing of Environment*  
*Remote Sensing for Ecology and Conservation*  
*Sensors*  
*Urban Forestry and Urban Greening*

## PRESENTATIONS AND INVITED TALKS

2019 Mapping tall shrub structure in Alaska at landscape scale using structure-from-motion photogrammetry and lidar (AGU, San Francisco, CA)  
2019 High resolution monitoring of forest ecosystems using UAV and cubesats (KU Leuven, Belgium; **Invited**)  
2019 Researching the District of Columbia (AU Library Conference for High-Impact Research, Washington, DC; **Invited Panelist**)  
2019 NITA Phenology and Python Tool Talk and Demo (AAG, Washington, DC)

- 2019 Hands-on Research in Real Time: Crowd Sourcing in the Classroom using Google Tools (Ann Ferren Conference, DC)
- 2018 Mapping boreal shrub biomass: Scaling from field estimates to spatial models using UAV and airborne lidar (AGU, Washington, DC)
- 2018 Update: Forest monitoring in interior Alaska using UAV, G-LiHT, and Landsat data (USFS/NASA meeting, Seattle, WA)
- 2017 Monitoring post-fire changes in species composition and stand structure in boreal forests using high-resolution, 3-D aerial drone data and Landsat (AGU, New Orleans, LA)
- 2017 Urban Ecosystem Analysis using Hyperspectral Imagery and Lidar Data (American University Sciences Colloquium)
- 2017 Monitoring post-fire changes in species composition and stand structure in boreal forests using optical imagery and structural data (SilviLaser, Blacksburg, VA)
- 2017 Cloud-resilient Remote Sensing Time Series Analysis of Land Cover Change in Tropical, Socio-environmental Systems (AAG, Boston, MA)
- 2017 Monitoring Approaches to Understand the Socio-ecological Dynamics of the Urban Forest (AAG, Boston, 2017) **(Invited Panelist)**
- 2016 Monitoring fire effects and post-fire ecosystem recovery in boreal forest using airborne lidar and spectral data (AGU, San Francisco, CA)
- 2016 Changes in forest structure from fires on Alaska's Kenai Peninsula measured using airborne lidar (ESA, Ft. Lauderdale, FL)
- 2016 Spatial Justice Symposium: Exploring the intersection of remote sensing, art, architecture and contemporary eco-politics in the making of new legal and political forums. (Co-convener, Basel, Switzerland) **(Invited)**
- 2016 Spatial justice at the threshold: sensing ecological conflict and more-than-human rights (Basel, Switzerland) **(Invited)**
- 2015 Quantifying forest and coastal disturbance from industrial mining using satellite time series analysis under very cloudy conditions (AGU, San Francisco, CA)
- 2015 Mapping urban forest structure using airborne imaging spectroscopy and lidar (ICUC9, Toulouse, France)
- 2015 Complete maps of urban forest structure and function using hyperspectral imagery and lidar data (AAG, Chicago, IL)
- 2014 Mapping Urban Forest Leaf Area Index Using Lidar: A Comparison of Gap Fraction Inversion and Allometric Methods (AGU, San Francisco, CA)
- 2014 Mapping Urban Forest Leaf Area Index with high scan angle lidar in discontinuous canopy (ForestSat2014, Riva del Garda, Italy)
- 2014 Mapping urban Leaf Area Index (LAI) using high point density lidar (AAG, Tampa, FL)
- 2013 Urban forest species mapping with imaging spectroscopy and lidar (AGU, San Francisco, CA)
- 2013 Urban forest inventory with imaging spectroscopy and lidar (Riegl UC, Vienna, Austria)
- 2013 Urban forest inventory with imaging spectroscopy and lidar (AAG, Los Angeles, CA)
- 2012 Crown scale fusion of imaging spectroscopy and lidar for urban tree species identification **(Invited)** (ForestSat2012, Corvallis, OR)
- 2012 Crown scale fusion of imaging spectroscopy and lidar for urban tree species identification (IGARSS, Munich, Germany)
- 2012 Mapping and quantifying the urban forest with imaging spectroscopy and lidar (ASPRS, Sacramento, CA)
- 2012 Mapping and quantifying the urban forest with imaging spectroscopy and lidar (AAG, New York, NY)
- 2010 Integrating ArcGIS Server and Flex: Highlighting Trees in Washington, DC (ESRI UC, San Diego, CA)
- 2010 The Benefits of Urban Trees (Center for Neighborhood Technology, Chicago, IL) **(Invited)**
- 2007 Incorporating GIS into Community Tree Inventories (Partners in Community Forestry, Baltimore, MD)

- 2007 Implementing the Urban Forest Effects Model in Washington, DC (Rutgers, NJ) **(Invited)**  
2004 Physician location and retention in rural Colorado (Assoc. of American Geographers, Philadelphia, PA)

## **PROFESSIONAL EXPERIENCE**

- 2007 – 2010 Casey Trees, Washington, DC – **GIS Specialist**  
2004 – 2006 Epic Systems Corporation, Madison, WI – Application Manager  
2003 – 2004 GVR Metropolitan District, Denver, CO – **GIS Consultant**  
Summer 2002 FV Bligh Reef and FV Carmen Rose, Cordova and Bristol Bay, AK – Fisherman  
2001 – 2002 Pictometry International, Rochester, NY – Aerial Data Acquisition  
Summer 2001 Middlebury College Geography Department, Middlebury, VT – **GIS Intern**

## **PROFESSIONAL AFFILIATIONS**

- Association of American Geographers (2011 – present)  
American Geophysical Union (2013 – present)  
International Association for Urban Climate (2015-present)