Daniel J. Donahoe

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HIGHLIGHTS

Dedicated Data Science Professional · Ph.D. Candidate · Laboratory, Field, and Computational Experience

EDUCATION

Virginia Tech · Ph.D. GEA · **Blacksburg, VA 24061** · **(Currently Pursuing)**

Ph.D. Candidate in Geospatial and Environmental Analysis (GEA). Current GPA: 4.0.
<u>Selected Coursework:</u>
Geosciences Data Science with Python, Remote Sensing in Natural Resources, Graduate Statistics I & II, Hydroinformatics, Analysis of Spatial Data, Intro to Science and Technology Policy

Virginia Tech · M.S. Geography · **Blacksburg, VA 24061** · **(Graduated: Spring 2022)**

Thesis: "Leveraging the Landsat Archive to Track Understory Evergreen Shrub Expansions in the Coweeta Basin, North Carolina." Final GPA: 4.0
<u>Selected Coursework:</u>
Advanced Forest Ecology, Advanced GIT in Land Change Modeling, Digital Terrain Analysis, Hyperspectral Remote Sensing, Vegetation Change, Principles of GIS, Remote Sensing

Virginia Tech · B.S. Fish Conservation · **Blacksburg, VA 24061** · **(Graduated: May 2017)**

Concentration in Freshwater Fish Conservation. Major GPA: 3.61. Graduated with honors.
<u>Selected Coursework:</u>
Fish Ecology, Principles of GIS, Geology, Ecology, Biological Statistics I & II, Oceanography, Population Dynamics, Freshwater Ecology, Fisheries Techniques, Fisheries Management, Ichthyology, Aquatic Entomology
<u>Competencies:</u>
Python (3.7–3.11), Bash scripting, Git (GitHub/GitLab), PyCharm, VSCode, Jupyter Notebooks/Lab, Conda, pip package manager, Python libraries (TensorFlow-Keras, Scikit-Learn, NumPy, Pandas, GeoPandas, rasterio, PySAL, gdal/ogr), Google Earth Engine (using both JavaScript and Python APIs), Overleaf/LATEX, Linux (Ubuntu), R, RStudio, requesting NetCDF data through NASA DAACs in Python, Microsoft Excel/Word/PowerPoint/Access, QGIS, ENVI, ENVI Classic, SAGA, ArcGIS Pro, ArcMap (10.6.x & 10.7.x), ArcCatalog, FRAGSTATS, SQL, ArcSWAT 10.6, ArcGIS StoryMaps, ArcGIS Online, Canva

EXPERIENCE

Graduate Research Assistant (PhD), Virginia Tech · **Blacksburg, VA 24061** · **(August 2022–Present)**

- Work schedule: 40hrs/week - M–F
- Assisting grant teams by developing geospatial workflows and generating data products for their delivery to research teams across academia and government (NASA, USGS).
- Specializing in the use of geospatial and remote sensing technologies to study landscape environmental change in response to disturbances and stressors to determine long-term environmental change.
- Building a strong foundation in geospatial programming by primarily using Python, VSCode, Jupyter notebooks, Google Cloud Platform, Google Earth Engine (cloud), and other related systems.

Intern, National Aeronautics and Space Administration (NASA)   ·   (June 2023–August 2023)

- Work schedule: 40hrs/week - M–F
- Developed workflows in Python for signal processing of hyperspectral imagery for eventual use in deep neural network models (deep learning) to predict forest growth.
- Constructed multilayer perceptron models in TensorFlow-Keras that harnessed multiple highly dimensional datasets and created a process for generating our labeled dataset for each study site in our investigation.
- Served as a valuable liaison between scientists and engineers and presented weekly updates to our team to inform members about the current status of my work.
- Maintained a Git repository and followed standard version control procedures for accurately documenting my work. Acquired additional experience in Linux server computing and writing GPU-optimized software.

Intern, Jet Propulsion Laboratory (Caltech/NASA)   ·   (June 2022–August 2022)

- Work schedule: 40hrs/week - M–F
- Composed a comprehensive dataset of geospatial training data for the development of machine learning models.
- Collaborated in developing a learning model to statistically downscale (super-resolution) ECOSTRESS land surface temperature imagery for the City of Boulder, Colorado.
- Participated in weekly discussions and research showcases to highlight the progression of our projects.
- Attended seminars to learn about cutting-edge geospatial and machine learning methods.

Intern, National Aeronautics and Space Administration (NASA)   ·   (June 2021–August 2021)

- Work schedule: 40hrs/week - M–F
- Conceptualized, developed, and executed an intern project to assist NASA's Surface Biology and Geology (SBG) mission at NASA's Goddard Space Flight Center (GSFC).
- Utilized Google Earth Engine to investigate vegetation change in the Chesapeake Bay by constructing a fused optical-radar dataset and employing novel machine learning techniques.
- Collaborated with an interdisciplinary team of Federal scientists and learned novel methods for researching marsh vegetation.

Graduate Teaching Assistant, Virginia Tech   ·   Blacksburg, VA 24061   ·   (August 2020–May 2022)

- Work schedule: 20hrs/week - M–F
- Generate assignments for undergraduate students to expand their understanding of physical geography.
- Host lectures (75 minutes) and present material to approximately 50 students that relates biotic and abiotic Earth processes.
- Infuse GIS and other software into our curriculum that introduces students to elementary terrain analysis tools.
- Grade approximately 100 assignments a week and help students that are struggling to learn the curriculum.
- Serve as a point-of-contact for approximately 50 students each semester.

North Carolina DEQ, EPA NRSA Coordinator   ·   Raleigh, NC 27609   ·   (April 2018–October 2019)

- Work schedule: 40hrs/week - M–F
- Spearheaded the North Carolina Department of Environmental Quality's (DEQ) participation in the 2018/2019 EPA National Rivers and Streams Assessment (NRSA)[1] and served as the Unit's lead fish taxonomist for 15 NRSA sampling outings.
- Supervised an interdisciplinary team of five scientists while in remote areas of North Carolina.
- Oversaw the logistics of NRSA field work and utilized Geographic Information Systems (ArcGIS: ArcMap) to spatially analyze sampling effort.
- Performed riparian habitat surveys, sampled fish assemblages, fish tissue, water chemistry, periphyton, benthic macroinvertebrate assemblages, and anthropogenic land disturbances for NRSA sampling outings.
- Managed databases using spreadsheet software (Microsoft Excel) for the Fish Community Assessment Program.
- Supported the report-writing process by compiling data and peer-reviewing documents.
- Utilized Global Positioning Systems (GPS) to plan sampling reaches and collect stream-gradient information.

- Communicated independently with EPA grant overseers and sent program materials using a suite of computer software (Microsoft Office, Outlook, Word, Excel, Exchange, SharePoint, Adobe Acrobat).
- Sampled 95 streams for the North Carolina basin-wide Fish Community Assessment Program[2].

U.S. Forest Service, PIBO Stream Technician · Ukiah, OR 97880 · (May 2017–September 2017)

- Work schedule: 40hrs/week - M–F
- Sampled over 40 streams for the U.S. Forest Service's PacFish/InFish Biological Opinion Effectiveness Monitoring Program (PIBO EMP) to analyze the status of bull trout and steelhead habitat.
- Embarked on prolonged backcountry backpacking trips in four-person crews while traversing uneven terrain above elevations of 7,000 feet in remote wilderness areas. Trained in wilderness first aid.
- Gained extensive experience in sampling fish habitat[3] by documenting channel geometry, substrate particle size, water chemistry, woody debris, collecting benthic macroinvertebrates, and discerning pool versus riffle habitats.
- Executed an intensive reach-scale stream survey using rigorous sampling protocol. Adept in troubleshooting problems with data computers/loggers.
- Collected and identified invasive mussels, crayfishes, and aquatic vegetation for the program's efforts in tracking invasive species across the western United States.
- Experienced with using stream surveying tools such as levels, stadia rods, Surber samplers, field tape measurers, GPS, maps and compasses, data loggers, sieves, and temperature/conductivity meters.

Virginia Water Resources Research Center · Blacksburg, VA 24061 · (January 2017–May 2017)

- Work schedule: 10hrs/week - M–F
- Collected, preserved, and identified over 50 different kinds of benthic macroinvertebrates to genus.
- Orchestrated the cataloging of macroinvertebrate samples while maintaining an orderly database.
- Followed procedures for maintaining a safe laboratory while adhering to strict protocols for processing samples.
- Adept in mixing ethanol for preserving lab specimens and using compound light microscopes.

Office of Sustainability, Asst. Team Leader · Blacksburg, VA 24061 · (August 2016–May 2017)

- Work schedule: 10hrs/week - M–F
- Led three interns towards the goal of educating Virginia Tech's students about living more sustainably.
- Acquired an advanced skillset in networking with students and school faculty using Google Cloud Services while constructing tangible goals for colleagues and associated sustainability advocates around campus.

Department of the Interior (DOI), Intern · Washington, D.C. 20240 · (May 2016–August 2016)

- Work schedule: 40hrs/week - M–F
- Within the Office of Environmental Policy and Compliance (OEPC), I developed project management skills and experience with environmental laws (CERCLA, RCRA, and FIFRA).
- Created story maps using GIS software (ArcGIS: ArcMap) to act as visual aids for congressional officials interested in the OEPC's progress. These story maps detailed remedial action taken at: Krejci Cuyahoga Site[4], Valley Forge Asbestos Release Site[5], Hillside Mine Site[6].
- Participated in departmental meetings involving sensitive discussions with high level officials.
- Focused on supporting the Central Hazardous Materials Fund (CHF); a source of funding to address the cleanup of hazardous waste sites on the Department of the Interior's managed lands.

Philmont Scout Ranch, Backpacking Guide · Cimarron, NM 87714 · (May 2015–August 2015)

- Work schedule: 40hrs/week - M–F

- Educated groups of 7–12 people about the fire-resistant forest ecology of northern New Mexico while guiding these groups through the Sangre de Cristo mountains.
- Conveyed the importance of conservation while preparing groups for 12–day backpacking trips through the most breathtaking backcountry wilderness that New Mexico had to offer.
- Developed public speaking skills that were crucial to communicating outdoor concepts to over 120 individuals throughout the summer.
- Instructed groups on how to use maps and compasses in the backcountry.

Philmont Scout Ranch, Fly Fishing Guide   ·   **Cimarron, NM 87714**   ·   **(May 2014–August 2014)**

- Work schedule: 40hrs/week - M–F
- Functioned as a backcountry staff member in the remote foothills of the Rocky Mountains while teaching over 1,200 individuals about the stream ecology of northeastern New Mexico.
- Attained experience in customer service and public engagement through teaching individuals how to fly fish and offering tours of historic buildings around the camp.

RESEARCH ACKNOWLEDGEMENT

Vander Vorste, R., A.J. Timpano, C. Cappellin, B. Badgley, C. Zipper, and S. Schoenholtz. 2018. Microbial and macroinvertebrate communities, but not leaf decomposition, change along a mining-induced salinity gradient. Freshwater Biology. doi: 10.1111/fwb.13253

SCHOLARSHIPS & AWARDS

CNRE Travel Grant (2026) – $600 – This award allowed me to travel to Gainesville, FL, to present my work on documenting storm-driven coastal forest retreat.

PRESENTATIONS

Donahoe, D. J., V. Thomas, and E. Hunter. Storm-driven Acceleration of Coastal Forest Retreat and Ghost Forest Formation. Oral presentation at ForestSAT 2026, May 4–8, 2026.

Donahoe, D. J. and M. Mair. Documenting Shoreline Loss in Virginia Using Satellite Imagery. Poster presentation at the Virginia Tech Office of Geographic Information Systems (OGIS) research symposium, April 11, 2025.

Donahoe, D. J., V. Thomas, and E. Hunter. Tracking Ghost Forest Progression Along the Eastern Seaboard Using the Landsat Archive (GC51N-0143). Poster presentation at the American Geophysical Union's fall meeting, December 13, 2024.

Donahoe, D. J., V. Thomas, and E. Hunter. Tracking Ghost Forest Progression Along the Eastern Seaboard Using the Landsat Archive. Poster presentation at the Salinity-Affected Lands in Transition (SALT) Conference, June 11, 2024.

Donahoe, D. J., J. MacKinnon, D. Harding, M. Brandt, and M. Moussa. Predicting Primary Productivity for Eastern Forests—Preliminary Efforts in Multi-path Fusion. Poster presentation at the annual summer intern poster showcase at NASA Goddard Space Flight Center, August 3, 2023.

Donahoe, D. J., S. Mauceri, G. Hulley, R. McHugh, L. E. Dee, and M. Hayden. Understanding Urban Heat Islands by Combining High Resolution Land Surface Temperature Observations with In-situ Air Temperature Measurements. Poster presentation at the national meeting of the American Geophysical Union, virtual, December 15, 2022.

Donahoe, D. J., L. M. Kennedy, A. R. Bhuta, and V. A. Thomas. Remotely Sensing Evergreen Shrub Expansion in the Southern Appalachians. Poster presentation at the national meeting of the American Association of Geographers, virtual, February 27, 2022.

Donahoe, D. J., and L. M. Kennedy. Remotely Sensing Evergreen Shrub Expansion in the Southern Appalachians. Poster presentation at the Class of 1970 Reunion, Blacksburg, Virginia, October 22, 2021.

Donahoe, D. J., and L. M. Kennedy. Using NDVI to Investigate Evergreen Shrub Expansion along Hannah Run in Shenandoah National Park, Virginia. Poster presentation at the annual meeting of the Southeastern Division of American Association of Geographers, virtual, November 7, 2020.

CERTIFICATIONS

NASA Applied Remote Sensing Training (ARSET) Program · **(Awarded: March 2022)**

- The National Aeronautics and Space Administration's ARSET program holds informational seminars to educate the public on utilizing remote sensing data for the monitoring changes on the Earth's surface. I was awarded a certification, and passing grade, for completing ARSET's course on "Using Earth Observations for Pre- and Post- Fire Monitoring."

Associate Fisheries Professional (FP-A), American Fisheries Society · **(Nov. 2018–Nov. 2023)**

- Earning my Associate Fisheries Professional certification indicates that I have fulfilled the necessary educational and professional requirements to conduct fisheries research.

MEMBERSHIPS AND HONORS

American Association of Geographers · **Washington, D.C. 20009** · **(January 2020–Present)**

- My membership with the AAG provides me with unique opportunities to share my research and network with a diverse field of geography professionals.

Tau Sigma National Honor Society · **Blacksburg, VA 24061** · **(December 2015–May 2017)**

- This diverse, student-run scholastic honor society required that members maintain a minimum GPA of 3.4 and afforded members the opportunity to network and plan community service projects around the town of Blacksburg.

Eagle Scout Award, Boy Scouts of America · **Falls Church, VA 22046** · **(Awarded: August 2012)**

- Acquiring the highest rank in the Boy Scouts of America, Eagle Scout, was a goal of mine since my childhood years. The last barrier to earning the rank of Eagle Scout required that I create, execute, and present a service project to my local community in Arlington, Virginia. I chose to clear a fallow plot of land in Arlington's Potomac Overlook Park and build a series of six Aldo Leopold-style benches. These benches are used as part of the park's education programs for local school groups.

VOLUNTEER OPPORTUNITIES

Interfaith Food Pantry · **Blacksburg, VA 24060** · **(September 2021–September 2022)**

- Virginia Tech's motto, *Ut Prosim*, has inspired me to volunteer my time at the Blacksburg Interfaith Food Pantry. Duties include packaging groceries for delivery, stocking shelves, and loading food into cars.

Serving my community provides desperately needed assistance to individuals currently facing hardship, especially during these difficult times.

Food Bank of Central & Eastern NC · **Raleigh, NC 27604** · **(May 2019–September 2019)**

○ During the summer of 2019, I volunteered on Saturday mornings and packaged meals, cleaned facilities, and created public awareness of the thousands of people facing hunger in the area.