

Isaac T. Hayes

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My current research is focused around developing a data driven method for rainfall-runoff modeling and watershed characterization in ungauged basins. The goal is to use inverse theory using NEXRAD radar data coupled with a single streamflow gauge at the outflow point of a watershed to characterize physical heterogeneities within the watershed. This characterization will assist in flood risk analysis and regional planning.

EDUCATION

PhD Environmental Engineering
Clemson University

Expected Graduation May 2021
Clemson, SC

National Science Foundation Research Traineeship (NRT) Program Fellow

Notable Coursework: Model Systems Under Risk, Geostatistics, Hydrologic Analysis & Design

B.S. in Environmental Science, Magna Cum Laude
Western Carolina University

May 2017
Cullowhee, NC

Extra Coursework Focus:

- **Mathematics:** Calculus 1-3, Ordinary Differential Equations, Engineering Mathematics
- **Engineering:** mechanical and electrical engineering, material science, project planning and management, design, fabrication, and testing.

PUBLICATIONS

- Styers, D. M., G. R. Dobbs, L. Cervený, and **I.T. Hayes**. Visualization and analysis of human ecology participatory mapping data in the southern appalachians. *International Journal of Applied Geospatial Research*, Accepted awaiting publication.
- **Hayes, I.T.** (2017). Evaluating recycling in two classroom buildings at western carolina university. *Appalachian State University Energy Summit*. (Poster)
- **Hayes, I.T.**, T.J. Nicholson, D.M. Styers, J.P. Gannon. (2017). Eco-hydrologic impacts of invasive evergreen shrub species in a headwater catchment area. *Association of Southeastern Biologists*. (Poster)
- **Hayes, I.T.** and A.T. Galavotti. (2017). Evaluating recycling in two classroom buildings at western carolina university. *Western Carolina University Foundation Board of Directors Meeting* (Talk)
- Waters-Tormey, C., D. Styers, K. Allen, and **I.T. Hayes**. (2016). Combining Geological Mapping and LiDAR Data to Characterize Fracture Patterns in Poorly Exposed Crystalline Bedrock in the Southern Appalachians, Western NC. Geological Society of America Annual Meeting, September 2016, Denver, CO. (Poster)
- **Hayes, I.T.** (2016). Sustainability of highlands biological station. *Appalachian State University Energy Summit*. (Poster)
- **Hayes, I.T.**, P. Bates, & D.M. Styers. (2015). *Determining the ability of ndvi to analyze low intensity burn severity in the southern appalachians*. *Society of American Foresters National Convention*. (Poster)

WORK EXPERIENCE

Environmental Engineering Graduate Research Assistant

Clemson University

August 2017 – Present

- Responsibilities: Using cluster analysis, inverse theory, GIS, and other computing skills to solve complex research problems regarding problems with rainfall-runoff modeling.

Geospatial Analysis Research Assistant

Western Carolina University

August 2015 – July 2017

- Responsibilities: using geospatial technologies and analysis to answer ecological research questions
Skills: data management, remote sensing imagery interpretation, classification, and analysis, LIDAR data analysis, Geographic Information Systems (GIS) data creation and analysis, proficiency in various GIS and remote sensing software programs

Environmental Science Research Assistant

Western Carolina University

August 2016 – July 2017

- Responsibilities: Lab tech and teacher's assistant for intro Environmental Science class, mixing chemicals, leading lab teams, editing papers, public relations work for WCU's Office of Sustainability

Remote Sensing Course Teacher's Assistant

Western Carolina University

Fall Semester 2016

- Responsibilities: Assisted students with in-class assignments, instructed lab, transposed labs from ENVI to ArcGIS; downloaded, organized, and pre-processed imagery for the class.

Construction Worker

Hayes Construction, Murphy, NC

2009-2016

- Responsibilities: Tasks associated with construction of a house. Created architectural drawings of house plans. Driving heavy machinery.

TECHNICAL SKILLS

- Python and MATLAB
- Microsoft Word, Excel, and PowerPoint
- Environmental data analysis and R software
- Proficiency in ENVI, ArcGIS, and FUSION software
- Geo-referencing points using GPS and ArcGIS

HONORS & ACTIVITIES

Chancellor's List (GPA 3.8 or higher) (WCU)

Fall Semester 2013, Spring Semester 2014
Fall Semester 2014, Spring Semester 2015,
Fall Semester 2015, Spring Semester 2016
Fall Semester 2016

Dean's Outstanding Scholar Award (WCU)

Spring 2017

Project Manager for the Sustainability Energy Initiative at WCU

January 2016- May 2017