

NATALIE N. ROBBINS

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RESEARCH INTERESTS

My research focuses on integrating remote sensing and Geographical Information Systems (GIS) to analyze environmental changes on the Earth and other planets. I am particularly interested in the development of novel informatics techniques to analyze spatial data and interpret environmental phenomena.

EDUCATION

2019 Tennessee Tech University, Cookeville, TN
Professional Science Master's Degree, Environmental Informatics, GPA 4.0
Remote Sensing and GIS Focus

2016 The University of Arizona, Tucson, AZ
Bachelor of Science in Environmental Science, GPA 4.0
Environmental Science & Policy Focus

RESEARCH EXPERIENCE

Project Title: Landscape Genetics of the State-Endangered Streamside Salamander (*Ambystoma barbouri*)

Collaborators: Nathaniel Wade Hubbs, Dr. Carla Hurt, TTU Biology, June 2019- present

- Combined use of QGIS and ArcGIS Pro to generate habitat parameters for use in least cost path analysis
- Creation of sampling and genetic cluster maps

Project Title: Geologic Mapping of Martian Terraced Fan Features

Advisor: Dr. Jeannette Wolak, TTU Earth Sciences, June 2018-May 2019

- Develop work flows for geologic mapping of Martian terraced fans within the ArcGIS Pro interface
- Troubleshoot ArcGIS Pro issues for a team of 5 undergraduate students along with faculty advisor
- Detailed 1:18,000 geologic mapping of the Shalbatana Vallis fan on Mars
- Remote sensing analysis of CRISM compositional data through ENVI 5.3 with IDL

Project Title: Remote Sensing of Illegal Gold Mines in Ghana, Africa

Advisor: Dr. Joseph Asante, TTU Earth Sciences, March 2018- present

- Perform remote sensing image analysis techniques (supervised classification, normalized difference vegetation index, Tassled-Cap transformation) to identify areas of illegal gold mine operations within Landsat satellite imagery
- Compare remote sensing analysis capabilities between ArcGIS Pro raster analysis tools and ENVI 5.1

SKILLS

Computer & Analytical: ESRI ArcGIS Desktop, ArcGIS Pro, and ArcGIS Online, QGIS, ENVI 5.3 with IDL, R, Google Earth, ALOHA, Python, RECware, Adobe Illustrator and Microsoft Office (Word, Excel, Powerpoint).

Field Skills: Map reading, mineral and rock identification, environmental sample collections using a soil auger, seine fishing, backpack electrofishing, collection and preservation of egg, larval and adult salamanders and snorkeling.

TEACHING EXPERIENCE

2017 – 2019, Tennessee Tech University, Graduate Teaching Assistant

- Directed undergraduate laboratory courses for 35 students per section for Physical Geology & Introduction to Meteorology
- Provide homework and test preparation support for undergraduate Cultural Geography
- Coordinate Geology 1040 laboratory sections for graduate and undergraduate TA's

WORK EXPERIENCE

2019- present, Vanderbilt University, Research Analyst I

- Consult on geospatial driven, faculty-led research projects across multiple disciplines
- Leverage open-source and ESRI GIS products to conduct geospatial modeling and analysis
- Conduct spatial statistical analysis using R, Python, and ESRI platforms

2019, Oak Ridge Institute for Science and Education (ORISE), ASTRO Intern

- Supported Oak Ridge National Labs ESRI Enterprise deployment
- Published and supported web maps and web applications for viewing and editing
- Created front-end enterprise site for ORNL GIS

2017 – 2019, Tennessee Tech University, Graduate Assistant

- Publication of the School of Environmental Studies' bi-annual newsletter
- Created rack cards, course fliers, and other promotional material for school recruitment
- Assisted at recruiting events for programs within the School of Environmental Studies

2016 University of Arizona Pima Cooperative Extension, Student Worker

- Assisted with Supplemental Nutrition Assistance Program, formally known as food stamps, community education for recovering drug addicts and convicts
- Participated in daily social media outreach
- Supported team of nutrition educators by preparing and creating nutrition education materials
- Planned and ran 4th Annual Desert Food Festival with a team of colleagues

2015 University of Arizona Pima Cooperative Extension, Extern

- Created informational devices for the sustainable school gardens certification program as laid out by the AZ Department of Health (AZDHS)
- Worked closely with the AZDHS to research and create preliminary standard operating procedures for aquaculture and vermicomposting within schools

HONORS AND AFFILIATIONS

- Tennessee Geographic Information Council (TNGIC) member (2018-present)
- Upper Cumberland Grotto member (2018-present)
- Tennessee Tech University, Diversity Fellow (2017- 2019)
- University of Arizona, Outstanding Graduating Senior for Environmental Science (Fall 2016)

PUBLICATIONS

Robbins, N., Bohanon, A. and Wolak, J.M. (2019, June). *Planetary Geologic Mapping using ArcGIS Pro: A Tutorial Series*. <https://tntechsedgeology.org/tutorials/>.

Robbins, N., McDonald, D., & Rivadeneira, P. (2017). *Steps to Becoming a Certified School Garden*. University of Arizona College of Agriculture and Life Sciences, Cooperative Extension Publication, 10 p.

CONFERENCE PRESENTATIONS

Robbins, N., Bohanon, A., and Wolak, J. M. (2019, June). *Planetary Geologic Mapping Using ArcGIS Pro: A Tutorial Series for Students*. Oral presentation for the Planetary Geologic Mappers Annual Meeting, Flagstaff, AZ.

Wolak, J. M., **Robbins, N.**, Bohanon, A., and Blaylock, H. E. (2019, June). *High Resolution Geologic Mapping of Terraced Fans in Xanthe Terra, Mars*. Poster Presentation for the Planetary Geologic Mappers Annual Meeting, Flagstaff, AZ.

Robbins, N., Bohanon, A., and Wolak, J. M. (2019, April). *Resolving Small Scale Features on Mars: Lessons from Coordinated High-Resolution Mapping, Xanthe Terra, Mars*. Oral Presentation for the Tennessee Geographic Information Council Annual Conference, Chattanooga, TN.

Bohanon, A., **Robbins, N.**, Smith, S. and Wolak, J. M. (2019, April). *Analysis of the Mineral Composition of a Terraced Fan in Camichel Crater*. Poster presentation for Tennessee Tech Student Research and Inquiry Day, Cookeville, TN.

Robbins, N., Bohanon, A., Smith, S., Blaylock, H. E., Loggins, M., and Wolak, J.M. (2018, November). *Many worlds, many maps, many users: Coordinating simultaneous mapping efforts with integrated datasets, Xanthe Terra, Mars*. Oral presentation for The Geologic Society of America 130th Annual Meeting, Indianapolis, IN.

Wade, O., **Robbins, N.**, and Asante, J. (2018, November). *Detecting Galamsey Activities in Ghana, West Africa using Remote Sensing Techniques and Landsat Imagery*. Poster presentation for The Geologic Society of America 130th Annual Meeting, Indianapolis, IN.

Blaylock, H. E., **Robbins, N.**, Smith, S. and Wolak, J. M. (2018, November). *Geologic Mapping of a Terraced Fan Deposit in Dukhan Crater, Xanthe Terra, Mars*. Poster presentation for The Geologic Society of America 130th Annual Meeting, Indianapolis, IN.

Wolak, J.M., Patterson A.B., Smith, S.D., and **Robbins, N.N.** (2018, June). *High-Resolution Geologic Mapping of Martian Terraced Fan Deposits*. Poster presentation at the Planetary Geologic Mappers Annual Meeting, Knoxville, TN.

PROFESSIONAL DEVELOPMENT

2019 TNGIC/STS-GIS Introduction to Tennessee LiDAR utilizing ArcGIS Pro and QGIS