Luke Wertis

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EDUCATION

University of Maryland — **Aug. 2023**
PhD, Geospatial Information Science — *College Park, MD*

Appalachian State University — **Aug. 2021 - May, 2023**
Master of Arts, Geography Thesis — *Boone, NC*

Appalachian State University — **Aug. 2012 - May, 2017**
Bachelor of Science, Applied Physics — *Boone, NC*
Minor: Mathematics

Research Interests

Geographic Information Systems (GIS), Spatial statistics, Spatial data structures and algorithms, Remote sensing, Landcover change, Invasive species, Machine learning, Causal Analysis, Difference-in-Difference

Peer Review Publications

Wertis, L., Sugg. M.M., Runkle, J.D., and Rao, Y., (2023) "Socio-environmental Determinants of Mental and Behavioral Disorders in Youth: A Machine Learning Approach" *GeoHealth* (Accepted)

Wertis, L., Runkle, J., Sugg, M. and Singh, D., (2022). "Examining Hurricane Ida's Impact on Mental Health: Results from a Quasi-Experimental Analysis" *GeoHealth*
https://doi.org/10.1029/2022GH000707

Ryan, S., Sugg M.M., J.D., Runkle, **L. Wertis**, D. Singh, and M. Meagher (2023), "Short-term changes in mental health help-seeking behaviors following exposure to multiple social stressors and a natural disaster" *American Journal of Public Health* (Under Review)

Sugg, M.M., Runkle J.D., Ryan, S., and **Wertis, L.**, (2022) "The Causal Effects of Maternal Health and Extreme Disasters: A Difference-In Difference Analysis of the South Carolina 2015 Floods" *International Journal of Disaster Risk Reduction*. (Under Review)

Ryan, S, J.D. Runkle, M M. Sugg, D. Singh, S. Green, and **L. Wertis.**, (2022) "Spatio-temporal clustering of adolescent bereavement in the United States during the extended response to COVID-19: A follow-up study" *Journal of Adolescent Health* (Accepted)

Sugg, M.M., **Wertis, L.**, Runkle J.D., Ryan, S., and (2022) "Cascading Disasters and Mental Health: The February 2021 Winter Storm and Power Crisis in Texas, USA" *Science of the Total Environment*
https://doi.org/10.1016/j.scitotenv.2023.163231

Ryan, S, Desjardins M., Runkle, J.D., **Wertis, L**, M.M. Sugg, (2023) "Evaluating Co-Occurring Space-Time Clusters of Depression and Suicide-Related Outcomes Before and During the COVID-19 Pandemic" *Spatial and Spatio-Temporal Epidemiology*. https://doi.org/10.1016/j.sste.2023.100607.

Runkle, JD., **Wertis, L**, Reed, C., Ryan, S., Berry, A and Sugg M.M**, "**Prenatal Psychiatric Emergency Visits Attributable to Warm Ambient Temperature: A time-stratified case-crossover study" *Environmental Health Perspectives* (Submitted)

Wertis, L., Ryan, S., Sugg M.M**.,** and Runkle J.D., "A Distributed Lag Non-linear Model of Acute Exposure to Extreme Cold and Hot Temperatures and Risk of Mood Behavioral Disorders in North Carolina" *Weather, Climate and Society* (Under Review)

Research Experience

Research Member / NIH and NSF CAREER grants **Jan. 2022 — Present**
Graduate lab, *Appalachian State University, USA*
Externally funded research project with my advisor Dr. Margaret Sugg, and Dr. Jennifer Runkle

• Manage and update large climatic, health, and human datasets for multiple research projects.
• Large data curation for implementation in statistical analysis and modeling.
• Develop procedures and perform causal inference using ARIMA and Difference-in-Difference methodologies
• Using longitudinal data sets and descriptive statistics, to identify the impact of climate events on physical and mental health.

Research Member / Independent Study **May. 2022 — Present**
Graduate lab, *Appalachian State University, USA*
Research project with Dr. Song Shu

• The goal of this project is to identify the most efficient areas to target for treating Hemlock Woolly Adelgid based on publicly available imagery.
• Develop and implement algorithms to perform individual tree segmentation and individual tree statistics using LiDAR data.
• Develop machine learning procedures to identify different tree species from the tree segmentation.
• Using longitudinal data set of land cover and descriptive statistics, identify what should be the highest priority locations for treatment based on what the most at-risk locations are.

Research Member / App Aqua **Aug. 2021 — June 2022**
Vis lab, *Appalachian State University, USA*
Research project with Dr. Jeffery Colby, Dr. Shea Tuberty, and Dr. Derek Martin

• The goal of this project is to understand better the complex human-environmental interactions affecting water resources in the Southern Appalachian headwaters.

• Developed a new method for processing raw water quality data using Python and optimized the data cleaning procedures.
• Participated in primary data collection at six sites along the South Fork of the New River.

Research Member / Southern Appalachian Ecosystem Service Project **Aug. 2021 — June 2022**
Vis lab, *Appalachian State University, USA*
Research project with my advisor Dr. Margaret Sugg, Dr. Steve Seagle, and Dr. Bill Anderson

• The goal of this project was to develop a regional environment, economic, and human health database to serve as a resource for future SAEREC and RIEEE research.
• Contributed to developing and creating a database of ecosystem services and socioeconomic characteristics.
• Implemented algorithms to calculate water flow through varying land cover.

Honors and Awards

- Graduate Research Assistant Mentoring Award, "Analyzing Mental Health Crisis Response in the U.S. to COVID-19," Cratis D. Williams School of Graduate Studies, $**24,000 (**2021-2023)
- Best Graduate Student Poster Award at ASU's Celebration of Student Research and Creative Endeavors (2022)
- National Science Foundation, Human-Environmental and Geographical Sciences (HEGS) CAREER Graduate Research Assistant (May 2022 - August 2022)
- National Institute of Environmental Health Sciences, Graduate Research Assistant (May 2022 - May 2023)

Teaching Experience

Teaching Assistant: GHY 3812 Introduction to GIS

Skills

Programming Languages: R, Python, JavaScript, HTML, CSS

Tools/Software: Leaflet, ArcGIS, QGIS, AutoCAD, ENVI, Jupyter Notebook