Duncan Anderson

University of Illinois at Urbana-Champaign
Department of Geography and GIS

Personal Information

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Education

University of Illinois at Urbana-Champaign **Expected Graduation: May 2023**
M.S. Student in Geography and GIS

North Carolina State University, Raleigh, NC **May 2020**
B.S. in Environmental Technology and Management, Minor in Environmental Toxicology, Focus in GIS
Cumulative GPA: 4.0

Research and Professional Experience

GIS Specialist
North Carolina Coastal Reserve and National Estuarine Research Reserve, Wilmington, NC — September 2020-August 2021

- Transitioning research GIS data to an online platform to increase scientific collaboration and public data documentation. Standardized metadata and documentation methods.
- Providing ad-hoc mapping support to agency GIS needs, including remote sensing and web mapping.
- Developed field data collection tools with ArcGIS Field Maps and Survey 123 for internal use and citizen science initiatives to improve efficiency in data collection.
- Mapped habitat and shoreline change for a coastal resilience project, including aerial imagery interpretation, and historical map georeferencing and interpretation.
- Trained agency staff in ERSI field data collection apps.

Using historical GIS to analyze forest change in Uxeau, France
North Carolina State University, Raleigh, NC — Fall 2018-September 2020
Dr. Scott Madry (UNC Chapel Hill) and Dr. Seth Murray (NC State University)
An interdisciplinary investigation of the rural Uxeau Commune's land use and corresponding ethnographic changes across several centuries.

- Performed QA-QC on digitizations from aerial photography and historical maps.
- Performed analysis of forest presence over time and relation to slope, aspect, elevation, and underlying geology, using the R statistical software for data processing.
- Performed a land cover change analysis using Landsat 7 and 8 data showing a recent decrease in forest cover.
- Linked 1834 cadastral map data to tax records to evaluate value and ownership of forests.
- Tied for best undergraduate poster at the 2019 *o*STEM National Conference.

Remote sensing of crop response to drought and carbon manipulation

Brookhaven National Laboratory, Upton, NY Summer 2019

Dr. Angela Burnett

Project focused on using remote sensing technologies to understand how crops response to stress from drought and constant harvest, while building a model to relate crop traits to their spectral reflectance.

- Collected thermal and spectral data from *Cucurbita pepo* at the leaf, canopy, and aerial scales while filtering for various spectral anomalies in various instruments.
- Developed methods to implement crop water stress indices with limited field time to quantify the drought effect, correlated with basic stress degree day index.
- Processed results with R statistical software and presented findings via poster and report.
- Accepted to the 2020 Posters on the Hill in Washington, DC. *Cancelled, COVID-19.*
- Was accepted for a continued position for summer 2020. *Cancelled, COVID-19.*

Uptake of emerging contaminants in wastewater in *Glycine max.*

North Carolina State University, Raleigh, NC Summer 2017- Fall 2018

Dr. Elizabeth Nichols

The possibility of chemicals of emerging concern being taken up into crops was investigated using a hydroponic growth experiment with irrigated wastewater.

- Grew *Glycine max* hydroponically with surface water and direct effluent sourced from a municipal land treatment site in Jacksonville, NC.
- Performed a non-targeted chemical detection screening of tissue samples and growth water; detecting common chemicals between site waters and plant material.
- Analyzed chemical data to show site-specific chemicals from upstream, downstream, and direct effluent samples, with more 'rare' chemicals being found downstream.
- Presented research at the 2018 State of North Carolina Undergraduate Creativity and Research Symposium and the 2019 National Conference on Undergraduate Research.

Community Water Quality Intern

Sound Rivers Inc., Washington, NC Summer 2018

- Coordinated volunteers for a Swim Guide recreational water monitoring program on the Tar-Pamlico River.
- Produced weekly water report videos with Riverkeeper staff and wrote final report of program results in collaboration with the second water quality intern in New Bern, NC.
- Conducted a "Muddy Water Watch" for noncompliance with construction sediment control measures.
- Drafted grants for future Swim Guide funding in the Tar-Pamlico basin and new funding for the Raleigh area.

Advisory Board, Engaging Leaders Program
NC State University College of Natural Resources, Raleigh, NC Fall 2016-May 2020

- Program focusing on professional development, leading through team strengths, conflict resolution, communication, and working with diverse populations.
- Officer duties (May 2017 - May 2020) included programmatic decision making and planning and executing bi-weekly meetings and two retreats annually.
- Guided current students in the creation of community outreach events with partners in underserved communities, and mentored students on planning their undergraduate career.

Teaching Experience

TA, Introduction to Geographic Information Systems
University of Illinois at Urbana-Champaign Fall 2021
Instructor: Fikriyah Winata

- Ran two lab sections and associated grading on basics of GIS and cartography.

Teaching Assistant, Fundamentals of Air Pollution (ET 320)
NC State College of Natural Resources Spring 2020
Instructor: Dr. Jennifer Richmond-Bryant

- Along with standard grading and tutoring duties, assisted students in navigating an air pollution modeling project in teams.
- Helped guide the quick transition to an online format during COVID-19.

Awards and Honors

- Dean's List, CNR Fall 2016-Fall 2019
- Best Undergraduate Poster (Tie), Out in STEM National Conference November 2019
- TG Harris-JP Harper-Chesapeake Corporation Scholarship 2019-2020
- NC State James L. Goodwin Academic Scholarship 2019-2020
- Crescent Resources/Duke Energy Endowed Scholarship 2019-2020
- NC State Jimmy Jones/Hoffman Forest Scholarship 2018-2019
- Ecology Honors Group Fall 2017
- NC State New Student Scholarship 2016-2017

Grants, Funding and Collaborations

- NC State Office of Undergraduate Research Travel Grant to attend Posters on the Hill 2020 in Washington, DC. ($1,060) February 2020
- NC State Office of Undergraduate Research Travel Grant for Out in STEM (oSTEM) National Conference 2019 Attendance. ($500) November 2019
- NC State CNR Terry Student Enrichment Fund Award for oSTEM National Conference 2019 Attendance. ($305) October 2019
- NC State Office of Undergraduate Research Grant 2017-2018
  Supplemental lab supplies for my uptake of emerging contaminants in wastewater in *Glycine max* project. ($480)

Publications and Scholarly Contributions

Dr. Scott Madry, Dr. Elizabeth Jones, Dr. Seth Murray, Dr. Tamara Misner, Dr. Amanda Tickner, **Duncan Anderson**. "An Interdisciplinary Analysis of Historical Forest Change in Southern Burgundy, France." *In submission to the Journal of Interdisciplinary History.* 2020.

Conference Presentations

Anderson, D. "Feeling' the Heat: Remotely Sensing Crop Temperature Response to Drought and Fruit Removal Stress." Posters on the Hill. April, 2020, Washington, DC. *Cancelled due to COVID-19.*

Anderson, D. "Feeling' the Heat: Remotely Sensing Crop Temperature Response to Drought and Fruit Removal Stress." National Conference on Undergraduate Research. March, 2020, Bozeman, MT. *Cancelled due to COVID-19.*

Anderson, D. "From La Révolution to Now: Mapping Forest Change in Uxeau, France over 253 Years." Oral Presentation. National Conference on Undergraduate Research. March, 2020, Bozeman, MT. *Cancelled due to COVID-19.*

Anderson, D. "From La Révolution to Now: Mapping Forest Change in Uxeau, France over 253 Years." Out in STEM (*o*STEM) National Conference. November, 2019, Detroit, MI. *Tied for best undergraduate poster.*

Anderson, D. "Would You Eat Crops Grown from Wastewater: A Qualitative Assessment of Chemical Uptake from Irrigated Wastewater." National Conference on Undergraduate Research March 2019, Kennesaw, GA.

Anderson, D. "Would You Eat Crops Grown from Wastewater: A Qualitative Assessment of Chemical Uptake from Irrigated Wastewater." State of North Carolina Undergraduate Research and Creativity Symposium. November, 2018, Raleigh, NC.

Membership in Professional Organizations

- Member, Out in Science, Technology, Engineering, and Mathematics (*o*STEM) since September 2018.
- Member, American Association of Geographers since Fall 2021.

Relevant Skills

Computer Software

- GIS and Remote Sensing: ArcMap, ArcGIS Online, ArcGIS Pro, QGIS.
- Programming Languages: R (novice), Python (novice), JavaScript for Google Earth Engine (beginner)

Equipment Skills

- HACH 2100P Turbidimeter
- YSI Professional Plus
- GeoXT Trimble 3000
- Spectral Evolution spectrometer
- FLIR thermal imaging devices

Field Skills

- Fecal coliform sampling
- Field thermal and spectral data collection and imaging
- ArcGIS suite of field data collection apps
- Received formal instruction in backpacking and working in backcountry environments.
- Experience in habitat mapping