EMILY EVENDEN

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Education

M.Sc. in Geographic Information Sciences – *GPA 4.07/4.0* ***Expected June, 2021***
Clark University*, School of International Development, Community and the Environment - Worcester, MA*

B.A. in Environmental Studies – *GPA 3.81/4.0* ***Dec. 2018***
The George Washington University*, Columbian School of Arts and Sciences - Washington D.C.*
University of Iceland - *Undergraduate Exchange Semester; Reykjavik, Iceland* ***Spring, 2018***

Master's Thesis

Title: ***Clarifying how TerrSet's Land Change Modeler should incorporate categorical variables in neural net models***
Clark University*, Advisors: Dr. R. Gilmore Pontius, Dr. J. Ronald Eastman – Worcester, MA*

- Conduct an extensive literature review of machine learning techniques, specifically Multi-layer Perceptron (MLP) neural network and Decision Forest, to better understand how categorical variables are typically encoded for these methods
- Develop a Python script to generate custom raster data that were used as case studies to demonstrate machine learning concepts
- Utilize TerrSet's Land Change Modeler to produce transition potential images for each case study in order to demonstrate how different categorical variable encoding techniques impact an algorithm's ability to identify patterns in data
- Use Zoom to work with my advisors in order to revise my written thesis proposal and meet university deadlines

Skills

Programming Languages: Python, R, SAS, ESRI ModelBuilder, SQL

Software: ArcGIS Pro, ArcGIS StoryMap, QGIS, OpenStreetMap, JOSM editor, Google Earth Engine, GeoDa, ERDAS Imagine, TerrSet, Jupyter Notebook, PostGreSQL, MS SQL Server, Zoom

Spoken Languages: English, Finnish (intermediate)

GIS Experience

Remote Sensing Research Assistant, **Clark Labs -** *Worcester, MA* ***Sept. 2019 – Present***

Global Landcover Prediction and Natural Landcover Vulnerability Mapping for 2050; *funded by ESRI*

- Present key journal articles concerning global and regional-scale land change modeling to a team of scientists and students for the purpose of identifying common methodologies and datasets used by field-experts from which to base our methodological protocol
- Evaluate over 40 GIS datasets from government, academic, and private databases based on the data's geographic coverage and potential relation to natural landscape loss for use in empirical, machine learning-based models
- Lead students in geoprocessing large datasets and maintain an organized database for final data versions while the project's lead scientist attended a conference
- Test two machine-learning algorithms, MLP neural network and Decision Forest, when modeling rare phenomena to determine which algorithm is better for modeling land transitions in geographically small countries
- Utilize TerrSet's Land Change Modeler and the MLP neural network algorithm to model natural landscape loss to agricultural expansion and urbanization and predict landcover at 2050 at a continental and individual country scale.
- Create a presentation and met with research sponsors to showcase our team's model results and the Beta version of our data products
- Publish Beta versions of landcover prediction and vulnerability data products to ArcGIS Online for public-use

Coastal Habitat Mapping: Mangrove and Pond Aquaculture Conversion; *funded by the Gordon and Betty Moore Foundation*

- Work with a team of students to research shrimp aquaculture and mangrove silviculture policies in Malaysia and presented these findings to a team of scientists and students in order to expand team knowledge about a new study area
- Download Tier 1 & 2 Landsat 7 and Landsat 8 imagery from USGS EarthExplorer and georeferenced Tier 2 imagery when cloud-free Tier 1 imagery was unavailable
- Follow a strict remote sensing protocol and conducted supervised classification using machine learning techniques, including MLP neural networks and Mahalanobis Distance, to identify key landcover types including aquaculture ponds, mangrove forests, and wetland
- Perform visual validation of classified imagery using Google Earth and corrected errors in my own and other students' work
- Consult the lead scientist when uncertain about remote sensing classification errors in order to maintain data quality assurance

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GIS Experience (continued)

Open-Source GIS Intern, U.S. Agency of International Development - *Remote* ***Summers 2017 & 2018***

- Mapped buildings and roads in OpenStreetMap using the JOSM editor for humanitarian organizations including the Presidents Malaria Initiative (PMI), the President's Emergency Plan for AIDS Relief (PEPFAR), and the USGS Volcanic Hazards Program
- Presented a lecture about volcanology to teach mappers about the project study area, Mt. Misti in Peru, and its status as an dangerous stratovolcano
- Researched and wrote two blog posts concerning the use of drones in humanitarian mapping and ecological niche modeling of vector-borne disease for the YouthMappers blog as independent projects

GIS Intern, Washington D.C. Economic Partnership - *Washington D.C.* ***Sept. – Dec. 2017***

- Aided data-driven decision-making by digitizing construction sites within *Washington* D.C. for web-mapping and statistical analysis of city redevelopment
- Created publically-available ArcGIS StoryMaps highlighting specific neighborhoods in D.C. and detailing large redevelopment projects for the organization's online Map of the Month column
- Gained in-depth knowledge about Washington D.C.'s neighborhoods and city government programs for local business by while working with a diverse team of technical and business professionals

Environmental Field Work Experience

"Field Methods in Geography", George Washington University *– Washington, D.C.* ***Fall, 2018***

- Created a quadrant and conducted canopy structure and density analysis to assess the impact of deer overpopulation on an urban park
- Analyzed stream structure, measured flow rate, and sampled aquatic species diversity to evaluate the impacts of stormwater drainage on the ecological health of an urban stream

Glacial Geology Research Assistant, Glacial Geology Field Work Trip - *South Iceland* ***May, 2018***

- Travelled to eight field work sites in South Iceland to examine the shapes, structures, and landscape patterns of glacial geology features to gain an in-depth understanding of how glacier expansion and retreat shape the physical environment
- Maintained a field work journal with detailed notes, photographs, and diagrams concerning the specific features of at each field site

Permafrost Research Assistant, Circumpolar Active Layer Monitoring (CALM) Program - *Utqiagvik, Alaska* ***Aug. 2017***

- Contributed to a NSF-funded project about polar amplification by probing permafrost depth as a proxy for active layer thickness
- Managed daily expenses for the research team and reported finances to the project leader as required by the sponsoring university

Customer Service Experience

Curbside Pick-Up Order Packer, Total Wine – *Shrewsbury, MA* ***July, 2020 – Present***

Barista, Starbucks - *Worcester, MA & Pittsburgh, PA* ***Jan. 2019 – July, 2020***

Store Opener, Prantl's Bakery - *Pittsburgh, PA* ***Jan. 2019– July, 2019***

Professional Development

Python for Data Science and Machine Learning Bootcamp, Udemy ***Aug, 2020***

- *Completed 25 hours of coursework related to Python libraries including Numpy, Pandas, Seaborn, SciKit Learn, and Tensorflow*

Maptalk: Geospatial Lightening Talks, Azavea ***Aug. 2020***

- *Presented about remote sensing indicators of Gypsy Moth defoliation in New England to 100 GIS professionals via Zoom*

American Association of Geographers (AAG) 2020 Conference Poster ***April, 2020***

- Shared a virtual poster about wetland retreat in the National Science Foundation's Long-Term Ecological Research Network Plum Island Ecosystems site

George Washington University 1st Place Research Awards for Undergrad Ecology and Sustainability ***April, 2019***

- Presented an in-person poster examining the Anacostia River Restoration in Washington D.C. through a social-ecological systems lens