William Henshaw

henshb@protonmail.com ∗ (484) 975-2270

Aspiring Geospatial Data Scientist

GIS Analyst pursuing a career in geospatial data science with the goal of solving agricultural, climate change, and sustainable development problems using satellite imagery and other remotely sensed data. Skilled in analyzing quantitative data in a GIS and/or IDE, identifying relationships between data, and effectively communicating these relationships visually and verbally.

CORE COMPETENCIES

- **Python**
- **GDAL/OGR**
- **ArcPy**
- **R**
- **PostgreSQL**
- **Snowflake**
- **PyTorch**
- **TensorFlow**
- **Leaflet API**
- **Google Maps API**
- **ArcGIS API (Python & JavaScript)**
- **Google Earth Engine**
- Spatial and Temporal Modeling
- Deep Learning
- Machine Learning
- Analytical Hierarchy Process
- Multi-Criteria Decision Making
- LiDAR Processing

EDUCATION

Master of Science, GEOGRAPHIC INFORMATION SCIENCE — **May 2022**
Clark University, Worcester, MA

Doctoral Coursework, ATMOSPHERIC SCIENCES — **August 2019 – January 2021**
University of Washington, Seattle, WA

Bachelor of Science, ENVIRONMENTAL SCIENCE — **May 2018**
Allegheny College, Meadville, PA

RELEVANT EXPERIENCE

GIS ANALYST — **June 2022 –**
EarthDefine, Redmond, WA

- Automated address integration pipeline using GDAL/OGR and ArcPy for use in geocoding API. Added 21 million new addresses as a result of this pipeline, leading to over 50% reduction in third-party API calls.
- Created PostgreSQL database of 215 million addresses, with access across any machine on the network. Increased query efficiency by over 90% compared to standard ArcGIS and QGIS querying methods.

REMOTE SENSING RESEARCHER — **January – April 2022**
NASA DEVELOP National Program, Langley Research Center

- Utilized Python and NASA Earth Observation Satellites to conduct cutting-edge research showcasing the capabilities of NASA satellites.
- Produced a technical paper that the National Park Service actively references to monitor air quality at Guadulupe Mountain and Carlsbad Caverns National Parks.

GIS ANALYST — **May 2021 – January 2022**
Flow Path AgTech, Newbury Park, CA

- Automated harvest scheduling and management workflows using ArcGIS for Python API. Achieved 98% automation from a fully manual process.
- Created map products using the ArcGIS Online suite of applications to support the technical and operational management of a grape-growing and marketing company.
- Assisted in the production of a machine learning model that detects harvest readiness of grapes. Contributions led to a seamless transfer of model outputs to an ArcGIS Online hosted feature service that allows for easy comparison between model and human assessments.

LIDAR ASSOCIATE — **July 2018 – July 2019**
Michael Baker International, Moon Township, PA

- Digitized engineering features (buildings, curbs, road shoulders, etc.) into a CAD environment for use by the client.
- Performed accuracy assessment of point cloud data by tying together points from multiple sensors; removed underground noise points; created and smoothed bare-earth models using MicroStation.
- Led a data collection group for three sites in Virginia, planned out collection paths, maintained the hardware and software of the LiDAR truck, and performed collection process. Lauded by supervisor as being responsible for the cleanest data he had ever processed.

RESEARCH EXPERIENCE

Winter 2022

***Spatiotemporal Analysis of Precipitation in Hawaii Using High-Resolution Gridded Rainfall Data,* Research Paper (ongoing)**

Calculated multiple precipitation frequency and intensity metrics across the Hawaiian islands from 1990 – 2014 using R with the goal of understanding long-term climate trends in the state. Presented at AAG 2022 and AGU 2023.

NASA DEVELOP

Spring 2022

***Spatiotemporal Analysis of Air Pollutants Collected from Ground and Space Instruments Around the Guadalupe Mountains and Carlsbad Caverns National Parks,* Research Project**

Examined average monthly, seasonal, and annual tropospheric column concentrations of NO_2 in Carlsbad Caverns and Guadalupe Mountain National Parks using measurements from OMI and TROPOMI satellites.

Clark University, Worcester, MA

Summer 2021

***High resolution, annual maps of the characteristics of smallholder-dominated croplands at national scales*, Research Project**

Compiled and assessed quality of 3-class labels for Republic of Congo with the goal of producing a raster layer of all smallholder farms in the country.

University of Washington, Seattle, WA

***Atmosphere and ocean energy transport in extreme warming scenarios,* Research Paper (link)**

Summer 2020 – Winter 2023

Evaluated outputs from three climate models showing extreme climate sensitivities out to 2300 from the SSP5-85 extension scenario of the newly released CMIP6 ensemble.

Allegheny College, Meadville, PA

GIS Suitability of Agrivoltaic Array Installation to Mitigate Climate Stress on Crops

Fall – Spring 2018

Used ArcGIS Desktop and TerrSet to create a suitability analysis of optimal farm locations to install agrivoltaics to mitigate increasing heat stress on crops and provide solar energy to the local community.

Identifying Short-eared Owl (Asio flammeus) Roosting Locations in Southwestern Pennsylvania using GIS

Spring 2018

Compared weighted linear combination, Boolean, and fuzzy GIS approaches to identify potential roosting locations for short-eared owls in Pennsylvania.

Comparison of Unsupervised and Supervised Classification for Urban Sprawl in Beijing, China

Spring 2017

Used supervised and unsupervised classification in TerrSet to assess urban development changes between 1988 & 2009 to determine urban sprawl resulting from the 2009 Olympics.

Using LiDAR to Locate Nutrient Loading Sources in Lake Wilhelm Watersheds

Spring 2017

Performed hydrologic modeling in TerrSet from DEMs. Leveraged ArcGIS Desktop to assess agriculture lands within buffer zone of each river.

Prioritization of Landowners in Pennsylvania for Sustainable Forest Management

Spring 2015

Performed suitability analysis to find forestland that fit criteria that Foundation for Sustainable Forests (FFSF) specified so that they can effectively inform landowners of sustainable forestry practices.

ADDITIONAL EXPERIENCE

SOCIAL MEDIA INTERN / CLIMATE CHANGE BLOG WRITER — **May 2020 – January 2021**

Reduce, Bellingham, WA

RESIDENT ADVISOR — **August 2016 – May 2018**

Allegheny College Residence Life, Meadville, PA

PROFESSIONAL AFFILIATIONS

* **ASSOCIATION OF PACIFIC COAST GEOGRAPHERS** — **March 2021**
* **ASSOCIATION OF AMERICAN GEOGRAPHERS** — **March 2021**
* **PI MU EPSILON, Mathematics Honor Society** — **April 2017**
* **PHI GAMMA DELTA, Pi Chapter** — **January 2015**