

# Matthew Walter

Newark, DE 19711: [mswalter@udel.edu](mailto:mswalter@udel.edu): 302-399-4965: Github: <https://github.com/mattswalter>

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## EDUCATION

- University of Delaware** 2020-present  
*PhD Candidate*  
Research Assistant for the Department of Geography and Spatial Sciences
- University of Delaware** 2018-2020  
*MS in Geography*  
Teaching Assistant for the Department of Geography and Spatial Sciences
- University of Delaware** 2014-2018  
*BA in Environmental Studies (Minor in Public Policy)*  
Graduate Certificate in Geographic Information Systems (GIS)

## RESEARCH EXPERIENCE

- Cascading Hazards in the Portland Metro Region** 2022  
Dr. Jola Ajibade  
Research Contractor  
Portland State University, Portland, Oregon, USA
- Mapping indices of vulnerability and resilience in Oregon.
  - Spatial-statistical analysis of vulnerability, resilience, and multiple disasters.
- Mapping Landcover in the Delmarva Peninsula** 2018-2021  
Dr. Pinki Mondal  
Research Assistant - Earth Observation for Sustainable Ecosystem and Livelihood (EASEL)  
University of Delaware, Newark, Delaware, USA
- Analyzed and processed high-resolution aerial imagery using techniques such as principal component analysis and spatial smoothing.
  - Mapped land cover and climate change impacts in the Delmarva Peninsula.
- The Effect of Human Activities on Wetlands in Delaware** 2018-2020  
Dr. Pinki Mondal  
Master's Thesis  
University of Delaware, Newark, Delaware, USA
- Mapped wetlands and other land covers in the State of Delaware using Landsat and Sentinel 1 Synthetic Aperture Radar (SAR) data.
  - Developed an index for assessing wetland stress using remotely sensed data using land cover, vegetation, and hydrologic information.
  - Mapped the invasive plant species *phragmites* in the State of Delaware.
  - Collect soil and water samples and analyze plant species in Delaware wetlands.
- The Impact of Inter-municipal Planning in Lancaster, PA** 2018-2020  
Dr. Nina David

University of Delaware, Newark, Delaware, USA

- Managed GIS data related to public policy such as zoning, urban expansion, and land cover data in Lancaster County, PA.
- Maintained databases and performed geospatial analysis to quantify land cover change and the effectiveness of inter-municipal plans on urban development.

### **Monitoring Small Farms in Pakistan, Ethiopia, and Bangladesh**

2019-2021

Dr. Sabrin Beg

University of Delaware, Newark, Delaware, USA

- Created time series Normalized Difference Vegetation Index (NDVI) dataset for Tehsils in Pakistan using Moderate Resolution Imaging Spectroradiometer (MODIS) data.
- Processed time series night light data and created maps for farms in Bangladesh using Visual Infrared Imaging Radiometer Suite (VIIRS) data.
- Performed spatial analysis on soil quality datasets in Pakistan and Ethiopia.

### **Measuring the Stemflow of Different Oak Species in an Urban Forest**

2014-2018

Dr. Asia Dowtin

University of Delaware, Newark, Delaware, USA

- Assisted PhD student in monitoring forest ecohydrology in Wilmington, Delaware.
- Set up stemflow and throughfall collectors, collecting throughfall and stemflow water samples, measuring Leaf Area Index with the LI-COR LAI 2000 plant canopy analyzer.

## **PUBLICATIONS**

**Walter, M.,** Mondal, P. Mapping of Phragmites in Estuarine Wetlands using High-resolution Aerial Imagery. *Submitted.*

**Walter, M.,** Mondal, P. 2019. A Rapidly Assessed Wetland Stress Index (RAWSI) Using Landsat 8 and Sentinel-1 Radar Data. *Remote Sensing* 11(21), 2549, doi: 10.3390/rs11212549.

## **TEACHING EXPERIENCE**

### **Introduction to GIS**

Spring 2020

Dr. Pinki Mondal

University of Delaware, Newark, Delaware, USA

- Ran lab section in various topics of geographic information science (GIS)
- Assisted students in troubleshooting weekly labs.
- Graded GIS lab assignments, aided in creating assignments, and maintained course website.

### **Know Your Satellites**

Fall 2019

Dr. Pinki Mondal

University of Delaware, Newark, Delaware, USA

- Helped to develop a graduate level course in remote sensing by creating scripts in Google Earth Engine with remote sensing applications such as filtering imagery, classifications, normalized difference indices, and raster calculations.

- Assisted in teaching the course by managing course site, providing feedback for student's remote sensing research projects, and assisting students in writing and debugging codes in JavaScript within the Google Earth Engine Platform
- Provided technical demonstrations for specific remote sensing workflows such as training a machine learning classifier.

### **Proseminar in Environmental Science**

Spring 2019

Dr. Xiao-Hai Yan

University of Delaware, Newark, Delaware, USA

- Assisted in teaching senior undergraduate students by managing the course website and creating and grading assignments
- Lectured and provided professional development advice for students in topics such as CVs, resumes, and cover letters.

### **Conservation: Natural Resources**

Fall 2018

Dr. Terrienne Lavin

University of Delaware, Newark, Delaware, USA

- Assisted in teaching by creating assignments and exams for various topics in environmental science (pollution, water quality, food scarcity, climatology)
- Graded assignments and worked with students to understand course materials.

## **GUEST LECTURES**

Introduction to GIS – University of Delaware

Fall 2020 & 2021

## **OTHER EMPLOYMENT**

### **Biological Aide**

2014-2022

Delaware Division of Fish and Wildlife

Department of Natural Resources and Environmental Control (DNREC), Smyrna, DE

- Educated children on aquatic ecosystems by teaching 5<sup>th</sup> grade field trips, running educational programs for children, creating educational materials such as posters, activities, and lesson plans, and providing information at a nature center.
- Worked in Hunter Education and Land Acquisition filing and updating GIS data and recording hunter data.
- Created virtual GIS assignment to introduce Middle School students to concepts in GIS.

## **ORAL PRESENTATIONS**

**Walter, M.** and Mondal, P. Invasive Species Mapping in Estuarine Wetlands Using High-Resolution Aerial Imagery. *American Association of Geographer's Annual Meeting*. April 2021. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Invasive Species Mapping in Estuarine Wetlands Using High-Resolution Aerial Imagery. *GIS Day - University of Delaware*. November 2020. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Invasive Species Mapping in Estuarine Wetlands Using High-Resolution Aerial Imagery. *Middle States American Association of Geographer's Annual Meeting*. October 2020. **Role:** Author and presenter

**Walter, M.** and Mondal, P. A Rapidly Assessed Wetland Stress Index (RAWSI) Using Landsat 8 and Sentinel-1 Radar Data. *American Association of Geographer's Annual Meeting*. April 2020. **Role:** Author and presenter

**Walter, M.** and Mondal, P. A Rapidly Assessed Wetland Stress Index (RAWSI) Using Landsat 8 and Sentinel-1 Radar Data. *Middle States American Association of Geographer's Annual Meeting*. October 2019. **Role:** Author and presenter

**Walter, M.** Wetland Stress and Remote Sensing – 90 second research talk. *Delaware Environmental Institute – Pitch 90*. November 2019. **Role:** Presenter

## **POSTER PRESENTATIONS**

**Walter, M.,** Miller, J., Yawatkar, V., Epanchin-Niell, R., Nguyen, E., Gedan, K., Tully, K., Mondal, P. Mapping Salt Deposits in the Delmarva Peninsula using Aerial Imagery and Landsat. *2022 Mid-Atlantic Regional Space Grant Consortia Meeting*. August 2022. **Role:** Author and presenter

**Walter, M.,** Mondal, P. Inequalities of Urban Park Quality using Remote Sensing and Social Media Data. *Delaware Environmental Institute Research Symposium*. April 2022. **Role:** Author and presenter

**Walter, M.,** Miller, J., Yawatkar, V., Epanchin-Niell, R., Nguyen, E., Gedan, K., Tully, K., Mondal, P. Mapping Salt Deposits in the Delmarva Peninsula using Aerial Imagery and Landsat. *Delaware Space Grant Symposium*. April 2022. **Role:** Author and presenter

Yawatkar, V., Nguyen, E., **Walter, M.,** Tully, K., Modal, P. Quantifying Land Cover Changes due to Saltwater Intrusion in the Delmarva Peninsula Using Machine-learning and NAIP Imagery. *Middle States American Association of Geographer's Annual Meeting*. October 2020. **Role:** Co-author

Yawatkar, V., **Walter, M.,** Qadir, A., Mondal, P. Machine Learning and Cloud Computing for Environmental Research. *University of Delaware Data Science: DARWIN Computing Symposium*. February 2020. **Role:** Co-author and presenter

Yawatkar, V., Nguyen, E., **Walter, M.,** Tully, K., Modal, P. Quantifying Land Cover Changes Due to Saltwater Intrusion in the Delmarva Peninsula Using Machine-learning and NAIP Imagery. *DENIN Graduate Research Symposium for Environmental Research*. March 2020. **Role:** Co-author

**Walter, M.** and Mondal, P. Using Satellite Data to Quantify and Map Wetland Stress. *Delaware Wetland Conference*. January 2020. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Using Satellite Data to Quantify and Map Wetland Stress. *Data Science Symposium – University of Delaware*. November 2019. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Using Satellite Data to Quantify and Map Wetland Stress. *GIS Day – University of Delaware*. November 2019. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Analyzing the Health of Wetland Buffers in Delaware using Land Cover. *Human and Climate Series III: Water Management and Policy*. June 2019. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Analyzing the Health of Wetland Buffers in Delaware using Land Cover. *Graduate Students' Forum for Research and Creative Works*. May 2019. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Analyzing the Health of Wetland Buffers in Delaware using Land Cover. *Delaware Environmental Monitoring Summit*. April 2019. **Role:** Author and presenter

**Walter, M.** and Mondal, P. Analyzing the Health of Wetland Buffers in Delaware using Land Cover. *American Association of Geographer's Annual Meeting*. April 2019. **Role:** Author and presenter

**Walter, M.** and Nina, D. Using GIS to Measure the Effectiveness of Inter-Municipal Planning. *Delmarva GIS Conference*. May 2018. **Role:** Author and presenter

## **MEDIA COVERAGE**

[UDaily article](#) covering Matthew's fieldwork with saltwater intrusion 2022

## **RESEARCH GRANTS**

NASA Delaware Space Grant Graduate Fellowship 2022

NASA Delaware Space Grant Graduate Fellowship 2021

Dr. John R. Mather Graduate Research Fellowship 2019

## **AWARDS**

Second Place Graduate Student Poster Award 2022  
*Delaware Environmental Institute Research Symposium*

Graduate Student Policy Award 2021  
*Ecological Society of America*

First Place Award for Outstanding Graduate Student Paper 2020  
*Middle States American Association Geographer's*

2019-2020 Teaching Excellence Award 2020  
*University of Delaware - Department of Geography and Spatial Sciences*

First Place Award for Outstanding Graduate Student Paper 2019  
*Middle States American Association Geographer's*

First Place Poster, Human and Climate Series III: 2019  
*Water Management and Policy: Local and Global Perspectives Symposium*

Special Merit Award in Environmental Studies 2018  
*University of Delaware - Department of Geography and Spatial Sciences*

## **AFFILIATIONS**

Delaware Data Science Institute Graduate Student Fellow

2021-2022

## **VOLUNTEERING**

Delaware Department of Natural Resources and Environmental Control - Environmental Justice Team

Delaware Nature Society – Coverdale Farm Preserve

University of Delaware Department of Geography and Spatial Sciences – EmPOWER Mentor

## **ADDITIONAL SKILLS**

### **Coding Languages**

Python, JavaScript, Fortran, R, Matlab

### **Geospatial Analysis**

ArcMap, ArcGIS Pro, ArcGIS Online (proficient)

QGIS (basic)

Google Earth Engine (proficient)

ENVI (moderate)

ArcGIS Python scripting (proficient)

Jupyter notebooks and Google Collaboratory (proficient)

R Studio (moderate)

### **Quantitative Data Analysis**

Python (proficient)

Matlab (basic)

Excel (proficient)

JMP (moderate)

Fortran (basic)

### **Other Technical Skills**

Microsoft Word and PowerPoint (proficient)

Adobe Photoshop and Illustrator (moderate)

Adobe Premiere and After Effects (basic)