JASON A. MATNEY

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CURRENT EMPLOYMENT

Dewberry July 2019 - present
GIS Resource Team Lead

- Serve as Resource Team Lead for the GIS Team within the Resilience Solutions Business Unit. Manage all workload elements for a team of GIS Professionals. Tasked with ensuring near 100% billable utilization rates, coordinating human capital deployment across Business Units, and acting as a lead point of contact for all deliverables produced by the GIS Team. Responsible for shaping the future of the GIS Team through employee retention, termination, and recruitment.
- Directly support Dewberry's Customer-Centered Communications (C3) contract. C3 is an arm of the NYC-based marketing firm HWC that partners with FEMA to build flood resilience for the real world. Regularly liaison with the C3 Research and Analytics team to support data-driven insight generation using the Civis Platform.
- Directly support Dewberry's Probabilistic Flood Risk Assessment (PFRA) contract. My work with PFRA involves pioneering innovative ways to assess risk, incorporating techniques from the burgeoning field of geospatial statistics, which is still in its infancy. Leverage cutting-edge spatial Machine Learning algorithms, vector- and raster-based big data, and interactive geovisualization platforms.
- Develop and deploy interactive geovisualizations using R Shiny with Leaflet JS, ArcGIS Web AppBuilder, and Tableau. Generate intuitive and data-rich map products that feature appealing design components and informative user interfaces.
- Lead and collaborate on the development of national scale geospatial analytical modeling efforts, as well as geospatial data collection, development, processing, cleaning, and validation. Develop scripts to automate data input preparation, process implementation and structure output format for large geospatial analytic processes.
- Coordinate with the internal and external stakeholders to collect requirements, inform analyses, and develop engaging, interpretable presentations of results. Build and maintain longterm relationships with an array of invested collaborators. Communicate results effectively and efficiently, both verbally and in writing. Tailor analytical results to both technical and non-technical audiences.

SECURITY CLEARANCE

EOD-Approved FEMA Security Clearance August 2019
Moderate Risk

EDUCATION

Doctor of Philosophy 2015 - 2019
Center for Geospatial Analytics
NC State University
Raleigh, NC

Master of Science 2012 - 2014
Department of Geography
Michigan State University
East Lansing, MI

Bachelor of Arts 2004 - 2009
Program in the Environment
University of Michigan
Ann Arbor, MI

PEER-REVIEWED ARTICLES

Published and In Preparation 2013 - 2019

Articles in Preparation in support of Dissertation

- **Matney, J.**, Slocumb, W. S., Smith, J. W., Bonsall, P., & Supak, S. K. (2019). Implementation and evaluation of a geospatial management solution for the U.S. National Park Service's Rivers, Trails, and Conservation Assistance Program. Journal of Park and Recreation Administration. doi: 10.18666/JPRA-2019-9250
- **Matney, J.**, Supak, S., van Berkel, D., Reich, B., & Tieskens, K. (2019) (In Preparation). Decision support for parks and protected areas: Leveraging big social media data to estimate visitation and examine visitor behavior. Manuscript in preparation for Proceedings of the National Academy of Sciences of the United States of America.
- **Matney, J.**, Supak, S., Slocumb, W. (2019) (In Preparation). The Intelligent Web Mapping Era: What is it, how does it alter the direction of the web GIS literature, and what are its future directions? Manuscript in preparation for Transactions of the Institute of British Geographers.
- Smith, J. W., Slocumb, W. S., Smith, C., & **Matney, J.A.** (2015). A Needs-Assessment Process for Designing Geospatial Data Management Systems within Federal Agencies. Journal of Map & Geography Libraries, 11(2), 226-244.
- Babcock, C., **Matney, J.**., Finley, A., Weiskittel, A., & Cook, B. (2013). Multivariate spatial regression models for predicting individual tree structure variables using LiDAR data. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, 6(1), 6-14.

TECHNICAL REPORTS

Professional reports completed in support of client-funded projects 2017 - 2019

- **Dewberry**, (2019). Longitudinal dataset README and Methodology note. Technical description of methods and scope of effort related to the compilation of longitudinal National Flood Insurance Program polices and claims data. Prepared for interested stakeholders in support of FEMA/FIMA's goals related to customer lifetime information, assessing policy tenure, and acquiring policy summaries at various geographic levels.
- **Matney, J.**, Slocumb, W. S., Hipp, A. J. (2018). Feasibility study and report to assess migration of a web GIS portal for geospatial data management to service the National Park Service Conservation and Outdoor Recreation Branch and Related Programs. Raleigh, NC: Center for Geospatial Analytics, NC State University.
- **Matney, J.**, Slocumb, W. S., Smith, J. W., Hipp, A. J., Smith, C. T., & Vatsavai, R. (2017). Needs assessment and guidance to define a clear vision for a geospatial mapping system to service the needs and opportunities of the National Park Service Conservation and Outdoor Recreation Branch and Related Programs. Raleigh, NC: Center for Geospatial Analytics, NC State University.

PROJECTS

Dewberry - Probabilistic Flood Mapping Fall 2019

Production and program support services for FEMA's Risk MAP Program

- Using geospatial statistics, investigated the extant spatial dependence between NFIP policies and claims and highlighted anomalous regions.
- Produced probabilistic risk points and associated summary reports for a number of regions.
- Developed geovisualizations of points representing average annualized losses (AALs), mapped against aggregated, anonymized, & pre-existing insurance policies and claims.

Dewberry - National Flood Insurance Program (NFIP) Research & Analytics Fall 2019

Support FIMA's goals of creating awareness of flood risk and insurance products

- Developed geovisualization products for insertion into content delivered to FEMA decision-makers.
- Assisted with the development and delivery of a Longitudinal dataset product though the use of various cross-validation methods.
- Ongoing work to develop a scalable method in support of acquisition efforts that relies on performing spatial clustering.

Dewberry - The Nature Conservancy's Stormwater BMP project Fall 2019
Support The Nature Conservancy's effort to analyze DC storm water best management practices (BMPs)

- Consulted with representatives from The Nature Conservancy to develop and deliver a web-based geospatial management tool
- Delivered on goal to provide the technical capacity to perform demographic and spatial analysis of BMP storm water sites throughout the Anacostia region of Washington, DC
- Implemented a "potential BMP edit tool" for estimating cost of installation based on area and BMP type, including a ArcGIS ModelBuilder tool for calculating cost estimates in the context of a cloud-based hosted feature layer.

Growers - Precision Agriculture Spring 2018
Management Zone Administration

- Implemented Management Zones across 1000+ acres for a startup precision agriculture company, using SMS software.
- Offered insights from extensive experience with deploying web mapping applications to CEO while working to develop a novel agriculture mapping and data analysis mobile tool.
- Reported to Chief Data Scientist while assessing influence of crop production covariates (Mg, S, etc.) for generation of planting and seeding prescriptions.

North Carolina Department of Transportation Spring 2018
Tax parcel and Easement mapping project

- Collaborated with project managers to assess tax implications of NCDOT construction throughout the Raleigh-Durham region
- Performed precise geospatial analysis, including manual digitization based on converted CAD data, on heterogeneous GIS layers acquired from various regional websites
- Spatially-Joined tax parcel data with state easement and right-of-way requests, producing an operational data table for organizational assessment

Markov Chain Monte Carlo visualization: Gerrymandering in real-time November 2017
Hackathon Project

- Synthesized socio-politcal and legal gerrymandering issues into a visual web app for public consumption.
- Distilled spatial Bayesian MCMC procedures into a simulated geographic representation of redistricting.
- Integrated Leaflet into a Shiny application for mapping support within an R web application.
- Collaborated with leading experts from academia and geospatial industries.
- Project available for viewing at *https://jamatney.shinyapps.io/mcmcviz-master/*

Geospatial Management Solution January 2015 - June 2019
NPS-funded Project

- Designed, developed, and delivered a three-application suite for the National Park Service that provides geospatial data upload, storage, view, edit, and delete functionality for over 2,000 funded projects nationwide.
- Facilitated productive communication between NPS decision-makers, NC State faculty and IT staff for a competitive, grant-funded project. Liaisoned with multiple stakeholders to arrive at product development compromises.
- Administered a Qualitrics survey of web GIS suite users with the goal of improving customer satisfaction.

LiDAR Uncertainty and Classification on ROGER May 2017
UCGIS Project

- Unified a suite of classification tools for efficient LiDAR classification using distributed computing resources.
- Implemented remote Hadoop calls on the ROGER supercomputer for analyzing massive LiDAR rasters.
- Selected from a number of competitive groups to present findings to leading CyberGIS researchers.
- Leveraged algorithms from the Python Data Abstraction Library (PDAL) to increase speeds for building classification from LiDAR point clouds.

GRADUATE STUDENT EMPLOYMENT

PhD Student January 2015 – June 2019
NC State University, Raleigh

- Designed and deployed a comprehensive suite of Web-enabled GIS applications for the US National Park Service.
- Worked closely with federal agency staff while customizing software in the ESRI suite using the JavaScript for ArcGIS 4.X API.
- Identified on-demand solutions for clients using advanced tools to visualize and track over 2000 funding streams valued at millions of dollars throughout the nationwide NPS system.
- Excelled in technical courses like Spatial Data Mining in R, Geoprocessing in Python, GRASS GIS, & Enterprise Server management in ArcGIS 10.5.

Graduate Student October 2011 – April 2014
Michigan State University, East Lansing

- Front-end scripting in R - implementing the spBayes package alongside MySQL database management.
- Improved prediction of environmental covariates extracted from LiDAR datasets using spatial Bayesian models.
- Developed charts using ggplot2 and reprojected remote sensing data via R's Raster package on GNU/Linux systems.
- Excelled in technical courses like Spatial data analysis, probability theory, Linear algebra, & Landscape Use and Land Cover simulation.

COURSES TAUGHT

Instructor – Environmental Science Capstone Jan. 2019 – June 2019
NC State University, Raleigh

- Lead an in-person capstone course for NC State undergraduate seniors in environmental sciences or related majors, emphasizing the use of analytical approaches for solving environmental problems and for communicating results.
- The primary goal was sheparding the development of student projects that highlighted sophisticated environmental decision-making, such as devising a resource management plan, developing a predictive model, prioritizing risk, identifying tipping points, designing new software or technologies, or predicting outcomes of environmental polices.
- Facilitated development of individual student projects, ensuring they fit within a team framework to simulate a work environment, while managing student-sponsor interactions, i.e., supporting student engagement with the Chatham County, NC Climate Change Advisory Committee.
- Following the completion of the semester, received positive feedback from students indicating that they appreciated the class and gained applicable hard and soft skills from participating in the course.

Co-Instructor – Introduction to Geographic Information Systems Sept. 2015 – Dec. 2018
NC State University, Raleigh

- Managed new content production for a 200-person online course required for all students matriculated within the Master of Geospatial Science and Technology program.
- Modernized the curriculum by integrating ArcGIS web-mapping applications, Spatial Data Analysis in R, and video tutorials throughout the curriculum.
- Fielded continuous troubleshooting requests by leveraging triaged feedback strategies while prioritizing student success and interactive engagement with the material.

Co-Instructor – WebGIS Frontiers: Protocols, Services, and Applications Sept. 2017 – Dec. 2018
NC State University, Raleigh

- Delivered insight into real-time GIS using GeoEvent Server to advanced graduate students.
- Improved breadth of the course by developing instructional material for custom hosted web apps using ArcGIS API 4.X for JavaScript.
- Supported distance education students through standardized feedback and assistance, including one-on-one google hangout consultation sessions.

CONFERENCE PRESENTATIONS

AWRA NCRS – *Serverless web maps for rapid probabilistic flood risk validation* 2020

ISSRM – *Park and Protected Area visitation estimation* 2018

UCGIS – *LiDAR Uncertainty and Classification on ROGER* 2017

NCGIS – *Web GIS For Federal Agencies With The National Park Service RTCA Program* 2017

PSAC-CESU – *A Geospatial Database and Web Mapping Application for the NPS* 2015

ISSRM – *A Needs Assessment for Geospatial Data Management Systems in Federal Agencies* 2015

AWARDS

Dewberry at Work Award - Perseverance 2019

NC State's Esri Development Center Student of the Year – Innovative use of Esri technologies in research 2019

Hackathon Developer – Accepted into Geometry of Redistricting workshop at Duke University 2017

UCGIS Summer School – Accepted into inaugural CyberGIS Summer School for GIS graduate students 2017

Columbia University Visiting Researcher – Developed models for biomass prediction using LiDAR data 2013

NASA-MSU Award – Professional Enhancement Award 2013

TECHNICAL STRENGTHS

Skills	Geospatial data analysis, web app customization, online technical instruction
Interests	Applied web mapping, machine learning, big data, and distributed computing
Design Software	Adobe Illustrator
Platforms	ArcGIS, R (Shiny, Leaflet), Python (ArcPy, Numpy, scikit-learn, Pandas), GRASS
Databases	PostgreSQL, PostGIS, MSSQL Management Studio, Hive, Hadoop

GEOSPATIAL ANALYTICS COURSES

Udemy: Python for Data Science and Machine Learning Bootcamp Spring 2019

ST 590 Applied Bayesian Analysis Spring 2016

ST 590 Statistical Learning and Data Mining Spring 2016

GIS 595 Advanced Environmental Remote Sensing Spring 2016

GIS 550 Geospatial Data Structures and Web Services Fall 2015

MEA 582 Geospatial Modeling Fall 2015

GIS 540 Geospatial Programming Spring 2015

CSC 791 Spatial and Temporal Data Mining Spring 2015