CURRICULUM VITAE

TUCKER V. HINDLE
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Professional Summary

Tucker is a skilled researcher experienced in geomatics and geographic information systems (GIS). He has a comprehensive knowledge of land surveying, spatial data science, and hydrologic modeling with technical experience applying ESRI GIS software and Python programming to various engineering projects. He has knowledge in photogrammetry and remote sensing from data acquisition to post-processing of multispectral imagery and LiDAR data. Tucker is currently pursuing a remote pilot certificate with a small UAS rating under FAA Part 107.

Education and Employment History

Education

Master of Science, Civil Engineering, Transportation/Geomatics Engineering concentration, Florida Atlantic University, Boca Raton, Florida. GPA: 4.0/4.0, August 2021. Thesis: Establishing and Downscaling a GIS-Based Flood Risk Screening Tool at the Watershed, Subwatershed, and Municipal Levels. Co-Advisors: Fred Bloetscher, Ph.D., P.E. and Hongbo Su, Ph.D., P.S.M.

Bachelor of Science, Geomatics Engineering, Florida Atlantic University, Boca Raton, Florida. GPA: 3.91/4.00 (*summa cum laude*), May 2020. Capstone Project: NFIP Community Rating System Flood Management Plan for the City of Clewiston, Florida.

Academic and Professional Experience

Research Coordinator, Florida Atlantic University (FAU) Laboratory Schools – A.D. Henderson University School and FAU High School, Boca Raton, Florida. March 2022 to present.

GIS and Field Data Specialist, AECOM, Fort Lauderdale, Florida. July 2021 to March 2022. Collaborated with dynamic project teams to deliver geospatial data creation, editing, management, analysis, and map production as well as support for UAS/Drone and GPS field data collection efforts. Utilized the ESRI ArcGIS suite of geographic information system (GIS) software and Python/R programming to prepare deliverables for various engineering projects:

Transportation:

- Florida Department of Transportation, District 4 Crash Clustering Analysis, Florida.
- Virginia Department of Rail and Public Transportation, Railroad and I-95 Right-of-Way Delineation, Virginia.

- Florida Department of Transportation, Traffic Study UAS/Drone Video Capture, Florida.

Water Resources:

- City of Miami Beach, Star Island 16-inch Force Main Replacement, Florida.

Environmental Remediation:

- National Aeronautics and Space Administration (NASA), Kennedy Space Center Per- and Polyfluoroalkyl Substances (PFAS) Monitoring, Florida.
- U.S. Air Force, Tyndall Air Force Base Remedial Investigation, Florida.
- U.S. Navy, Naval Air Station Whiting Field Remedial Investigation, Florida.
- Atlantic City Electric, Environmentally Regulated Features Web Map, New Jersey.

Energy and Communications Infrastructure:

- Transmission Developers Inc., Champlain Hudson Power Express (CHPE) Renewable Power Transmission Line, New York.
- Invenergy, New York Harbor Marine/Terrestrial HVDC Power Cable Route Landing Point Assessment, New York.
- U.S. Navy, Marine Corps Base Camp Pendleton Asset Evaluations, California.
- Naval Facilities Engineering Command (NAVFAC) Southwest, Naval Weapons Station Seal Beach Communications Infrastructure Database, California.

Graduate Research Assistant, Center for Water Resiliency and Risk Reduction, Florida Atlantic University, Boca Raton, Florida. May 2020 to July 2021. Developed a large-scale locally relevant flood risk screening tool, that is, one capable of generating accurate probabilistic inundation maps quickly while still detecting localized nuisance-destructive flood potential. Implemented machine learning techniques to model the water table elevation using regression analysis and map impervious surfaces using multispectral image classification. Integrated the SFWMD CASCADE 2001 flood routing model and Arc Hydro with GIS (ArcGIS Pro) to compare the predicted flood response to heavy rains at varying scales of analysis. The results of this research include several peer-reviewed publications and watershed master plans.

Undergraduate Research Assistant, Department of Civil, Environmental and Geomatics Engineering, Florida Atlantic University, Boca Raton, Florida. August 2019 to May 2020. Managed, analyzed, and modeled geospatial and hydrologic data using GIS software (ArcGIS Pro). Utilized a flood routing model integrated with GIS to develop probabilistic inundation maps. Prepared maps and technical reports to support the development of watershed-based flood protection plans (cwr3.fau.edu). Assisted the City of Clewiston, Florida with advanced modeling tools for assessing stormwater risk and solutions, as well as designed a comprehensive floodplain management plan in compliance with the NFIP Community Rating System.

Intern, FAU Kelly Family Foundation Undergraduate Research Fellowship in Coastal Affairs, FAU Harbor Branch Oceanographic Institute, Boca Raton, Florida. January 2018 to June 2018. Utilized GIS software to georeference land survey maps and digitize historical positions of Florida's coastline. Calculated change rate statistics using the USGS Digital Shoreline Analysis System to map and analyze movement over time. Created a publicly available, interactive online map (URL: arcg.is/1mnena). The results of this research include a peer-reviewed publication.

Instructional and Mentoring Experience

GIS Instructor (affiliated with AECOM employment), Utilities Department, Town of Lake Clarke Shores, Florida. January 2022 to March 2022. Designed curriculum and led instruction for the Town of Lake Clarke Shores' utility engineers on how to effectively leverage geographic information systems, specifically ESRI ArcGIS Pro, for water and wastewater utilities data.

Graduate Student Mentor, Center for Water Resiliency and Risk Reduction, Florida Atlantic University, Boca Raton, Florida. May 2020 to July 2021. Guided incoming staff in the preparation and presentation of research findings. Led and met regularly with the watershed modeling team consisting of eight (8) master's students, two (2) Ph.D. students, and one (1) post-doc at Florida Atlantic University as well as two (2) master's students at the University of Central Florida.

Trainings Developed, Center for Water Resiliency and Risk Reduction, Florida Atlantic University, Boca Raton, Florida. Co-authored guidance documents with Fred Bloetscher and Hongbo Su:

- "Implementing the FAU Center for Water Resiliency and Risk Reduction (CWR3)'s Watershed-Based Flood Risk Modeling Protocol."
- "Preparing Data for the Cascade 2001 Flood Routing Model using ESRI ArcGIS Desktop."
- "Getting Started with Arc Hydro and HEC-GeoHMS in ESRI ArcGIS Desktop."

Scholarship, Research, and Creative Activity

Refereed Journal Articles

Bloetscher, F., Rojas, G., Abbate, A., **Hindle, T.**, Huber, J., Jones, R., Liu, W., Meeroff, D. E., Mitsova, D., Nagarajan, S., Oglesby, G., Polsky, C., Su, H., Suarez, E., Teegavarapu, R., Weaver, J., Xie, Z., Yong, Y., & Zhang, C. (2021). "A Framework for a Subwatershed-Scale Screening Tool to Support Development of Resiliency Solutions and Flood Protection Priority Areas in a Low-Lying Coastal Community." *Journal of Geoscience and Environment Protection*, 9(10), 180–205. DOI: 10.4236/gep.2021.910013

Bloetscher, F., Abbate, A., Huber, J., Liu, W., Meeroff, D. E., Mitsova, D., Nagarajan, S., Polsky, C., Su, H., Teegavarapu, R., Xie, Z., Yong, Y., Zhang, C., Jones, R., Oglesby, G., Suarez, E., Weaver, J., Hoque, S. M. M., & **Hindle, T.** (2021). "Establishing a Framework of a Watershed-Wide Screening Tool to Support the Development of Watershed-Based Flood Protection Plans for Low-Lying

Coastal Communities." *Journal of Infrastructure, Policy and Development*, 5(1): 1273. DOI: 10.24294/jipd.v5i1.1273

Hindle, T., Su, H., Su, T., & Hindle, T. K. (2019). "Mapping Historical Changes in Florida's Coastline from 1875 to 2000." *Florida Atlantic Undergraduate Research Journal*, 8(Spring), 19–24. URL: journals.flvc.org/faurj/article/view/115434

Other Publications

Hindle, T. (2021). "An Examination of Downscaling a Flood Risk Screening Tool at the Watershed, Subwatershed, and Municipal Levels." M.Sc. thesis. Florida Atlantic University, Boca Raton, FL. URL: purl.flvc.org/fau/fd/FA00013779

Hindle, T., Rodriguez, J., & Hamm, J. (2018). "Learning to Scan." *xyHt Magazine*, 5(August), 43–47. URL: xyht.com/author/tucker-hindle

Technical Reports

Contributed to several technical reports for the Watershed Master Planning Initiative Pilot Program funded by a $1.7 million grant (PI: Fred Bloetscher) from the Florida Division of Emergency Management (FDEM) and Federal Emergency Management Agency (FEMA). URL: cwr3.fau.edu/clearinghouse

- Watershed Master Planning Template
- Example Watershed Plan: Caloosahatchee Watershed
- Case Study: Caloosahatchee Watershed
- Case Study: Charlotte Harbor Watershed
- Case Study: Everglades Watershed

Presentations

Tucker Hindle. "A GIS-Based Approach to Flood Inundation Modeling in the Caloosahatchee Watershed." Presented at the University of Florida/Florida Region of the American Society for Photogrammetry and Remote Sensing (ASPRS) Fall 2020 LiDAR Workshop, October 22nd, 2020.

Tucker Hindle, Shayne Fassler, Elsa Gaunner, Rosa Walls, and Joel Rodriguez. "Capstone Project: City of Clewiston Flood Management Plan." Presented to the FAU Geomatics Engineering Program Advisory Board, April 28th, 2020.

Fred Bloetscher, Dan Meeroff, Yan Yong, Hongbo Su, Glen Oglesby, and Tucker Hindle. "Watershed Master Planning Initiative and Its State/National Impact." Presented to the Florida Division of Emergency Management, Bureau of Mitigation, February 18th, 2020.

Coursework, Projects, and Involvement

Coursework

Surveying and Mapping: Geodesy, Geodetic Positioning, Terrestrial Laser Scanning, and Construction Surveying.

Geomatics: GIS (ArcGIS Desktop/Pro), Photogrammetry, Remote Sensing, and UAS Mapping.

Programming: Data Science (Python – e.g., NumPy, Pandas, Matplotlib, and Scikit-Learn), Geospatial Databases (SQL), GIS Programming (Python/ArcPy), and Surveying Data Analysis.

Academic Projects

Utilized supervised object-based image classification to map impervious surfaces, 2021.

Modeled water table elevations from sparse groundwater monitoring wells and LiDAR-derived digital elevation model (DEM) data using regression analysis, 2021.

Developed several Jupyter Notebooks using the Python Data Science Stack, covering topics in exploratory data analysis (EDA), statistics and probability distributions, machine learning (regression analysis and classification), and deep learning, 2020.

Developed a spatial database in PostgreSQL to support freeway bottleneck analysis, 2021.

Created a digital elevation model using drone imagery and Metashape photogrammetry software for volumetric calculations of a reservoir, 2020.

Projected operability levels at Port Everglades over time during potential sea level rise scenarios using ArcGIS Pro, 2020.

Mapped land surface temperature from Landsat 8 thermal bands and Normalized Difference Vegetation Index (NDVI) using ArcGIS Desktop, 2020.

FAU Student Organizations

Member, Data Science and Machine Learning Club, 2021.

President, American Society for Photogrammetry and Remote Sensing (ASPRS) Student Chapter, 2018 – 2021.

Member, Florida Surveying and Mapping Society (FSMS) Student Chapter, 2018 – 2021.

Collegiate Athletics

NCAA Division I Florida Atlantic University Cross Country, 2018.

NCAA Division II Lee University Cross Country and Track & Field, 2016 – 2017.

Honors and Awards

Faculty Award for Outstanding Academic Achievement, FAU Department of Civil, Environmental and Geomatics Engineering, 2020.

Faculty Award for Outstanding Leadership, FAU Department of Civil, Environmental and Geomatics Engineering, 2020.

Undergraduate Researcher of the Year (College of Engineering & Computer Science Awardee), FAU Office of Undergraduate Research and Inquiry, 2019.

Indian River Chapter of the Florida Surveying and Mapping Society Scholarship, 2019.

Outstanding Student (College of Engineering), FAU Northern Campus Achievement Award, 2019.

FAU Kelly Family Foundation Undergraduate Research Fellowship in Coastal Affairs, 2018.

Florida Surveying and Mapping Society [State-Level] Scholarship, 2018.

Palm Beach Chapter of the Florida Surveying and Mapping Society Carl Miller Memorial Scholarship, 2018.

Keith and Schnars, P.A. [Civil/Geomatics Engineering] Scholarship Endowment, 2018.