JULIAN SPERGEL

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Hydrology modeler and data analyst with a background in satellite imagery processing, geospatial information analysis, and physics-based models. Experienced in hands-on skill mentorship and breaking down complex analytical problems into simple, easily presentable solutions.

Education

DOCTORATE (PhD) – Aug 2016 - May 2022
Master of Phil. – May 2020, MA – May 2018
Department of Earth and Environmental Sciences. Columbia University. NYC, NY

BACHELOR OF SCIENCE - Sep 2012 - June 2016
Department of Geophysical Sciences. University of Chicago, Chicago, IL

Selected Work Experiences:

Hydrology Modeler/ Aug 2022 - Present
Environmental Protection Division, Georgia Department of Natural Resources, Atlanta, GA

- Produced and implemented CDM Smith DYNFLOW models to analyze the sensitivity of the Floridan Aquifer to the position and magnitude of groundwater pumping in the Savannah/Hilton Head area. These results were incorporated into groundwater planning policy in SE Georgia, as part of the Coastal Sound Science Initiative.
- Modeled river flow metrics using a 3D physics-based model (HEC-RAS). I have used HEC-RAS models to inform policy decisions for sturgeon spawning habitat conservation in the St. Marys River, Habitat Conservation Plans for freshwater mussels in the Apalachicola-Chattahoochee-Flint Basin in collaboration with the Jones Center at Ichauway, UGA, and H2O Policy Center, river flooding in Talona Creek, northern GA for water permit review.
- Modeled water resource usage changes for the state of Georgia, ensuring that requested water demands did not impact downstream communities. Prepared official permit review documents and presented these internally and to external permittees.
- Helped set up foundational best-practices in integrating a new Object-Constraint Language model of Georgia's water supply network (OASIS BEAM).
- Learned proficiency in the suite of Army Corps. of Engineers hydrology software (HEC-RESSim, HEC-RAS, etc) to assist GAEPD in addressing emergent hydrology situations.

- Utilized ArcGIS batch processing to rapidly provide geographic insights on policy implementation.
- As a volunteer for the Georgia Emergency Management Agency, coordinated generator and water pump delivery during extreme weather events.

Doctoral Researcher / Aug 2016 – Feb 2022
Columbia University, NYC, NY

• Created cutting-edge scientific studies of surface melting in Antarctica, an emergent field of climate science. Processed and analyzed a novel, untested 100s GB altimetry dataset with cluster-distributed data processing (data synthesis and analysis using Python, MATLAB, ArcMap, and the newly developed Google Earth Engine)

• Created physical simulations of Antarctic surface hydrology in MATLAB with inputted surface topography and air temperature

• Designed a new method of batch-processing hundreds of optical images to extract water depth and freeze-through rate with thermal modeling and optical light attenuation.

• Authored and co-authored multiple publications. Presented research at scientific conferences and workshops.

Skills and Languages

Advanced geospatial and hydrological data analysis (modeling, satellite imagery processing, spatial data ETL, "Big Data" (distributed data processing)

Expert in quality control and extrapolating from "messy" sensor output

Advanced GIS, MATLAB, Python coding experience

Proficient in data visualization (Microsoft Office, Adobe Creative Suite, MatplotLib)

Python: Advanced; **MATLAB**: Advanced; **ArcGIS**: Advanced; **QGIS**: Advanced;

Quick to learn new modeling software

Selected Publications

A full list of publications and conference presentations can be found at www.julianspergel.com/publications-and-presentations/

J.J. Spergel. "Lower Flint River Basin Habitat Conservation Plan: Inundation Models of Low-Flow in HECRAS". Presented on 3/25/2025 at the 2025 Georgia Water Resources Conference

J.J Spergel. Modeling and remote sensing of meltwater drainage on Antarctic ice shelves. Graduate Thesis. Apr 13, 2022. https://doi.org/10.7916/swez-dp81

J. J. Spergel, J. Kingslake, T. Creyts, J.M. Van Wessem, H. A. Fricker, (2021). Surface meltwater drainage and ponding on Amery Ice Shelf, East Antarctica, 1973–2019. Journal of Glaciology, 1-14. doi:10.1017/jog.2021.46