

Jacob Brown

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PRIMARY EXPERIENCE

RESPEC | Denver, CO *Hydrologist*

JANUARY 2019 - MAY 2022

- Acted as my office's go-to GIS expert, which included:
 - Building custom tools for model development and inspection using Python, ArcPy, and GDAL
 - Maintained custom GIS websites for client interactions and data presentation
 - Used satellite imagery and publicly available products, such as USGS elevation data, to inform work
 - Analyzed and managed data through built-in tools, custom tools, and relational databases
 - Building tools to facilitate map-making and exports for technical and general audiences
 - Helping my colleagues with GIS functionality and map-making
 - Working with a company-wide group to establish standards and best practices
- Created and maintained custom Python tools and libraries, including:
 - Libraries to read, write, and run hydrologic and hydraulic models
 - A tool to inspect HEC-RAS models in ArcGIS
 - A tool for Monte-Carlo simulations in HEC-RAS
 - A tool to calculate and export parameters for watersheds for use in rainfall-runoff models
 - A tool to inspect the completion and accuracy of SWMM models
- Assisted in creating machine learning models by managing and annotating data
- Analyzed global climate models to investigate infrastructure resilience to climate change, which included:
 - Analyzing global climate model projections and data for statistical trends to inform possible future hydrologic conditions for two Colorado watersheds
 - Writing a paper about the process and findings for internal and external use
 - Co-creating a presentation of the findings at the 2021 CASFM Virtual Annual Conference
- Wrote papers and gave presentations to a variety of audiences on topics such as:
 - Erosion countermeasures and streambank protection measures for arroyos in New Mexico
 - NOAA Atlases 2 and 14
 - Rain-on-snow events in alpine environments
 - Water quality data and analysis

SKILLS & EXPERTISE

- Python
 - Flask/SQLAlchemy
 - ArcPy
 - Pandas
 - GDAL
- PostgreSQL
- SQL & relational databases
- Statistics
- Git & GitHub
- Data visualization
- R
- ArcGIS & Esri products
- QGIS
- JavaScript
- HTML/CSS
- HEC-RAS, SWMM, CUHP
- Excel/Google Sheets
- French

PUBLICATIONS

An integrated statistical and deterministic hydrologic model for analyzing trace organic contaminants in commercial and high-density residential stormwater runoff modeling, Science of the Total Environment, Vol. 673, 2019

Modeling Trace Organic Contaminants in Commercial and High-Density Residential Urban Stormwater Runoff, Master's Thesis Dissertation, Colorado School of Mines, 2018

Colorado Department of Public Health & Environment | Denver, CO

Intern

AUGUST 2018 - DECEMBER 2018

- Created custom GIS tools with Python to streamline data analysis
- Created a custom tool with Python and R to evaluate water quality data for investigations and reports
- Analyzed GIS data for discrepancies and completeness
- Aided colleagues with statistical research and understanding

Colorado School of Mines | Golden, CO

Research Assistant

AUGUST 2017 - AUGUST 2018

- Researched trace organic contaminants in commercial and high-density residential urban stormwater runoff from two catchments in Madison, WI
 - Performed nonparametric statistical analysis of the provided data
 - Integrated the findings in a deterministic model for future analysis and use
 - Created products to visualize data and analysis

NCAR | Boulder, CO

Research Assistant

MAY 2017 - AUGUST 2017

- Created and ran WRF-Hydro models for two watersheds in the Denver Metropolitan area and statistically analyzed the results for model performance
- Attended the 2017 CUAHSI Conference on Hydroinformatics and assisted my supervisor with her presentation

MD Ranger | Burlingame, CA

Intern

JUNE 2011 - AUGUST 2011

- Researched and cleaned the database used to create their reports using MySQL and Python

PRESENTATIONS

Is My Transportation Infrastructure Resilient to Floods Under Climate Change? Piloting New National Guidelines in Colorado and Across the Country, CASFM Virtual Annual Conference, 2021

Modeling Trace Organic Contaminants in Commercial and High-Density Residential Urban Stormwater Runoff, Master's Thesis Defense, Colorado School of Mines, 2018

EDUCATION

Full Stack Web Developer Class, Udacity, 2023

M.S., Hydrologic Science and Engineering, Colorado School of Mines, August 2016 - August 2018

B.A., Mathematics and French, Pomona College, August 2009-May 2013

Denver Public Schools | Denver, CO

Lead Math Fellow

AUGUST 2017 - MAY 2018

- Was promoted to Lead Math Fellow my second year:
 - Became the school's team leader and liaison between the school and the Denver Math Fellows program
 - Participated in extra professional training
- Taught mathematics to children who were behind grade-level in small groups
- Aided teachers in the classroom with projects and learning objectives
- Aided in school functions, such as recess supervision, dining hall supervision, and test implementation

Ministère de l'Éducation Nationale | Bègles, France

Assistante de langue vivante

SEPTEMBER 2013 - MAY 2014

- Served as a colloquial and cultural bridge between the United States and France
- Created and implemented English lessons to students, from individuals to full classrooms
- Chaperoned a class field trip to London, England

California Academy of Sciences | San Francisco, CA

Guest Services Attendant

JULY 2012 - SEPTEMBER 2013

- Worked on the museum floor to help guests have a full and vibrant experience
- Was responsible for guest and animal safety
- Helped visitors navigate the museum
- Aided francophone visitors whenever they required assistance or had questions