# Robert Sterling Spencer

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## EDUCATION

**Master of Science, Environmental and Water Resources Engineering** Graduated: Dec 2016
University of Texas at Austin | GPA: 3.86

**Bachelor of Science, Environmental Engineering** Graduated: Dec 2014
University of Colorado at Boulder | GPA: 3.42 | Dean's List (5)

## RELEVANT WORK EXPERIENCE

**National Renewable Energy Laboratory (NREL)** Golden, CO 80401 Mar 2017 - Present
**Researcher III – Data Scientist & Engineer** | Data Science and Innovation Group

- Building a collaborative cloud-based decision optimization tool with a data management solution for planning long-term energy transition scenarios of Hawaii's power systems.
- Developing scientific data-driven applications on web/cloud platforms to facilitate collaborative analytics.
- Crowdsourcing and standardizing of industry and government data for enhanced accessibility and search-ability.
- Assessing the geospatial technical potential of renewable energy resources distributed across the U.S.
- Creating interactive and immersive visualizations for exploring and analyzing large multi-dimensional datasets.
- Parallel processing of big data on NREL's High Performance Computer (HPC) and Amazon Web Services (AWS)

**Kaleid, LLC** Denver, CO 80401 Oct 2018 – Present
**Founder** - Crowdsourcing platform & podcast dedicated to exposing the best ideas from all sides of the conversation

**Science Systems and Applications, Inc. (SSAI)** Greenbelt, MD 20771 Mar 2017 – Mar 2018
**Scientific Programmer/Analyst I** (See descriptions below for NASA: Goddard Space Flight Center)

**NASA: Goddard Space Flight Center (GSFC)** Greenbelt, MD 20771 Jun 2016 - Dec 2016
**Student Research Assistant** (Aug 2016 – Dec 2016) **|** **Graduate Intern** (Jun 2016 – Aug 2016)

- Evaluated a satellite retrieval algorithm's quality assurance for atmospheric aerosols by performing geospatial and temporal collocations and exploratory data analysis with aircraft and ground-based instruments.
- Developed scripts to extract, sample, and visualize key areas from large remote sensing datasets and imagery.
- Aided atmospheric scientists in characterizing the interactions and uncertainties between aerosols and clouds.

**University of Texas Center for Research in Water Resources** Austin, TX 78705 Jan 2016 - May 2016
**Graduate Research Assistant**

- Developed a framework and workflow for producing planning maps for emergency responders in flooding events.
- Visualized probable flooding depths and velocities at river crossings for road closures from a hydraulic model.
- Worked with stakeholders to optimize communication interfaces between forecasting systems and firefighters.

**Institute of Arctic and Alpine Research** Boulder, CO 80303 May 2013 - Aug 2015
**Antarctic Field Research Grantee** McMurdo Dry Valleys LTER, Antarctica Dec 2014 - Feb 2015

- Procured climate and ecological data through stream flow measurements, land surveying, water quality sampling, and algal mass collection, while maintaining a network of hydrologic stream gauges in Antarctica.
- Lived and worked among a small efficient team while inhabiting Antarctica's extreme environments.

**Undergraduate Research Assistant**

- Rectified and published raw stream flow, rating curve, and water quality records for an online database.
- Developed a regression analysis to model synthetic hydraulic behaviors of a glacier-fed stream.
- Conducted sampling and tracer studies at various rivers and lakes within Colorado's watersheds.
- Assisted with preparing graduate research papers for publication through peer review sessions.

## RELEVANT VOLUNTEER EXPERIENCE

**Engineers Without Borders,** University of Colorado's Nepal Team Mar 2011 - May 2013
**Project Design Leader** (May 2012 – May 2013) **|** **Treasurer** (Dec 2011 – Dec 2012)

- Effectively provided clean drinking water to a developing community of over 200 Nepali people by designing and constructing a protection system and tap stand for a fresh water spring.
- Ensured sustainability of a water treatment system for a hospital in Nepal by composing an O&M plan.

- Collected, compiled, and assessed land survey data and performed water quality tests on spring sources.
- Obtained approval to implement technical design plans through collaboration with licensed engineers.
- Documented health and safety forms pertaining to site and travel safety.
- Developed strong relationships with the community by participating in user group and municipality meetings.
- Successfully maintained an annual budget of approximately $100,000 by managing withdrawals and spending.
- Secured funding through writing grant proposals, organizing fundraiser events, and presenting to rotaries.

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**Other Activities and Affiliations**

- Freelance Private Tutoring for all levels of STEM topics — Aug 2015 – Feb 2017
- American Geophysical Union — Aug 2016 – Present
- American Water Works Association – Rocky Mountain Region — Oct 2011 - Present
- Society of Environmental Engineers — Aug 2011 - Dec 2014
- Volunteering – Habitat for Humanity, Volunteers for Outdoor Colorado

**Awards and Honors**

- NASA Goddard Student Poster Session Swoosh Award – 1st Place — 2016
- NSF's Antarctica Service Medal of the United States of America — 2015
- RMWEA/RMSAWWA Student Design Competition – 2nd Place — 2014
- Engineers Without Borders – Chapter of the Year Award — 2012
- Art Institute Scholarship – 2nd Place — 2009

**Publications**

- Spencer, R. S., Levy, R. C., Remer, L. A., Mattoo, S., Arnold, G. T., Hlavka, D. L., et al. (2019). Exploring aerosols near clouds with high-spatial-resolution aircraft remote sensing during SEAC4RS. Journal of Geophysical Research: Atmospheres, 124, 2148– 2173. https://doi.org/10.1029/2018JD028989
- Spencer, R. S., Macknick, J., Aznar, A., Warren A., and Reese, M. O. (2019). Floating Photovoltaic Systems: Assessing the Technical Potential of Photovoltaic Systems on Man-Made Water Bodies in the Continental United States. Environmental Science & Technology 2019 53 (3), 1680-1689. DOI: 10.1021/acs.est.8b04735

**Skills**: Algorithm Development | Spatiotemporal Data Analysis | Visualization | Uncertainty Modeling (Monte Carlo Simulation, Multivariate, Extreme Value) | Systems Modeling | Multi-objective Optimization | L/NL/MIL Programming | Bayesian Inference | Decision Trees | Hypothesis Testing | Machine Learning (ANN, SVM, Clustering) | Data Curation/QA | Cost-Benefit Analysis

**Tools**: Python | Django | ArcGIS | SAS | SQL | R | Bash | GAMS | CPLEX | LaTeX | GitHub | Matlab | VBA | Adobe | HTML/CSS | JavaScript | D3 | Ruby on Rails | Docker | Postgres | Scrum | AnyLogic | AWS | Celery | Redis | Earth Engine

**Courses**: Decision, Risk, and Reliability | Sustainability & Renewable Energy | GIS | Systems Engineering | Statistics | Regression Analysis | Water Resources Planning & Management | Sampling & Analyses | Material & Energy Balances | Fluid Mechanics | Heat Transfer | Thermodynamics | Engineering Processes | Ecology | Geomorphology | Hydrology