# Heather Childers

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## EDUCATION

**Master of Science in Atmospheric Science** (Expected 2026)
**University of California, Davis (UC Davis)**
Affiliations: Global Environmental Change Lab

**Master of Environmental Data Science (MEDS)** (June 2024)
**Bren School of Environmental Science & Management – University of California, Santa Barbara**
Highlighted Coursework: Geospatial Analysis and Remote Sensing, Python for Environmental Data Science, Statistics for Environmental Data Science, Computer Modeling in Environmental Research

**Bachelor of Science in Biological Systems Engineering** (June 2022)
**University of California, Davis**
Minor: Atmospheric Science
Honors: Dean's Honors List for Spring 2020
Highlighted Coursework: Atmospheric Chemistry, Evapotranspiration Measurement and Modeling, Air Pollution, Heat Transfer in Biological Systems, Properties of Materials in Biological Systems

## GEOSPATIAL & SATELLITE DATA EXPERIENCE

**Investigating Changes in Land-Use and Water Storage in Yolo County** (11/23–12/23)
**Statistics for Environmental Data Science Course Project**

- Computed zonal statistics for the land cover of a cropped county of interest from a bi-annual land cover raster to quantify the change in cultivated cropland from 2003 to 2021
- Performed an STL decomposition on the water equivalent thickness anomaly data from the GRACE data analysis tool to view changes in water storage in the Yolo County area
- Compared trends in the water equivalent thickness anomaly to the monthly precipitation data from the nearest National Weather Service station
- Standardized varying datatypes for statistical analyses, including multiple linear regression, and created data visualizations to identify relationships between the variables of interest

**Exploring the Socioeconomic Impacts of the 2021 Blackout in Houston, Texas** (10/23–12/23)
**Geospatial Analysis and Remote Sensing Course Project**

- Combined vector, raster, and SQL-queried data through reprojection, cropping, and sub-setting of geospatial datasets to identify blackout areas for cross-referencing with socioeconomic data
- Created reproducible maps using tmap and ggplot2 to visualize and compare the economic status of Census Tracts that maintained or lost power during the blackouts
- Discovered that economic status was not a predictive factor of blackouts in Houston, Texas, and that further analysis is necessary to determine if there were additional socioeconomic consequences

**Determined Suitable Growth Area for Aquaculture Species Along the West Coast** (10/23–12/23)
**Geospatial Analysis and Remote Sensing Course Project**

- Developed a function to calculate and visualize the suitability of each exclusive economic zone on the Western U.S. Coast for aquaculture of a species based on user-inputted optimal growth condition
- Combined sea surface temperature, bathymetry, and exclusive economic zoning data using cropping, masking, resampling, and reprojection of raster data, alongside map algebra for calculating suitability

**Visualizing the Impact of the 2017 Thomas Fire on Santa Barbara County** (11/23–12/23)
**Python for Environmental Data Science Course Project**

- Accessed U.S. Environmental Protection Agency data to create a Time Series Analysis of the 2017 vs. 2018 Air Quality Index using Matplotlib to visualize the impact of the Thomas Fire on Air Quality
- Manipulated netCDF and shapefiles in Python and created a false color image using Matplotlib to visualize the Thomas Fire burn scar over Santa Barbara County

## CAPSTONE PROJECT EXPERIENCE

**Understanding the Influence of Parameter Value Uncertainty on Climate Model Output** (10/23–6/24)
**Role: Project Manager | Client: National Center for Atmospheric Research (NCAR)**

- Accessed net-CDF model outputs from the Community Land Model Parameter Perturbation Experiment (PPE) to create a multi-file dataset for future manipulation, visualization, and archival
- Wrote Python functions using the Pandas, Numpy, and Xarray packages to perform dimensional reduction and produce land-weighted and annual averages on multi-file datasets
- Developed an interactive Panel dashboard for containerized and future launch using Docker
- Managed personnel resources by setting clear team expectations, tracking team member contributions, and mitigating interpersonal conflicts through the re-distribution of tasks
- Collaborated with a diverse team of students to produce project deliverables, including a Design and Implementation Plan, Technical Documentation, and presentations for faculty review
- Presented the final scope and deliverables of the capstone project to a large, non-technical audience

**Development of a Bioreactor for Protein-Enriched Feed from Almond Hulls** (9/21–6/22)
**Role: Team Member | Client: Biological and Agricultural Engineering Department at UC Davis**

- Collaborated with four students to generate project deliverables, including progress reports, Gantt charts, and presentations, ensuring instructors were informed about project advancements
- Consulted with principal investigators to conduct a needs assessment, define project scope, research relevant technologies, and iteratively develop and test the prototype, engaging clients for feedback
- Followed experimental protocols for growth medium preparation, fungal inoculation, collection and filtration of fungal spores, sterilization, and compositional analysis to verify reproducibility
- Developed new experimental protocols to increase batch samples while increasing the protein content to at least 15% and optimizing resource consumption during fermentation
- Assisted in the design, modeling, and manufacturing of the temperature and humidity-controlled bioreactor prototype to test the feasibility of large-scale manufacturing
- Converted project deliverables and experimental protocols into a digital, task-based format, allowing team members to sign up for tasks and update the team on task progress in real-time
- Presented a prototype and poster at the UC Davis College of Engineering Senior Design Showcase 2022 to outline the importance of reducing food waste through biological engineering processes

## PROFESSIONAL EXPERIENCE

**Society of Biological Engineers Alumni Advisor** Dept. of Bio & Ag Engineering at UC Davis (9/25–Present)

- Coordinated with the department chair, faculty advisor, and organizing board to understand the needs of the Biological Systems Engineering student body for professional development workshops
- Curated original material specific to the coursework completed by the Biological Systems Engineering students to help them navigate their career paths, networking skills, and plans for higher education

**Sikama International Inc.,** Santa Barbara, CA

**Engineering Associate** (9/21–6/23)

- Spearheaded the company's transition from hard copy to digital documentation, consolidating 400+ assembly manuals with version control to preserve tribal knowledge and streamline customer support
- Created SolidWorks parts and assemblies for new and existing machines to improve internal records
- Collaborated with the Senior Production Engineer and Director of Sales to utilize SolidWorks models as marketing materials and validate custom requests from high-value clients

**Engineering Intern** (6/21–9/21)

- Trained production staff on relevant software features and assisted staff with technical problems with MS Office Suite and Dozuki, ensuring a smooth transition to a modernized business model
- Led progress meetings with management staff to provide updates and discuss project milestones, ensuring alignment with organizational and senior leadership goals

## PROPOSAL WRITING EXPERIENCE

**Primary Student Author – Bren Capstone Project Proposal** (9/23–12/23)
**Development of an Interactive Toolkit for Climate Impacts on the Channel Islands Marine Sanctuary**
Wrote a successful project proposal outlining the project background, feasibility, and logistics by working individually with the client and creating a formal submission to the Capstone Review Committee

**Student Co-author – Bren Capstone Project Proposal** (9/23–12/23)
**Understanding the Influence of Parameter Value Uncertainty on Climate Model Output**
Collaborated with students and clients to define the project scope and deliverables, research background information, and outline possible approaches with relevant programming languages and packages in a successful project proposal

## LEADERSHIP EXPERIENCE

**Dean's Advisory Council Member** Bren School of Environmental Science & Management (9/23–6/24)
- Condensed live feedback and survey results from active students to provide the Dean with summaries of key concerns and actionable solutions, ensuring student satisfaction for current and future cohorts
- Cultivated open communication between the Dean, staff, and students to improve the student experience

**MEDS Class of 2024 Co-chair** Bren School of Environmental Science & Management (9/23–6/24)
- Coordinated with the Bren Student Leadership Committee to align students on pressing issues
- Organized community-building events and assisted Bren staff with outreach and fundraising events for improvements and diversity scholarships
- Effectively managed multiple schedules by maintaining the MEDS Assignments Google Calendar, ensuring students were up to date on class deadlines, events, and important announcements

**Womxn in Science and Engineering Social Chair** University of California, Santa Barbara (5/23–6/24)
- Anonymized and reviewed annual fellowship applications of graduate student summer funding for the UC Santa Barbara Graduate Division to facilitate equitable distribution of funding to women in STEM
- Organized regular club events, including making flyers and Instagram posts, reserving spaces, and coordinating presenters, all while working within a budget set by the finance chair
- Planned outreach events for youth and women in STEM at local high schools, museums, and other Santa Barbara-based Women in STEM events

**Society of Biological Engineers President and Events Coordinator** UC Davis (6/20–6/22)
- Spearheaded the club's transition from virtual to in-person events while following safety guidelines
- Organized various events, including Barbecues, bowling, study sessions, game nights, bike rides, industry speakers, and collaborations with the Graduate Student Association and the Internship and Career Center
- Registered the club with all officers and current members to the university, attended informational sessions for club leaders, and filled out necessary forms for participation in club outreach events
- Responsible for documenting club purchases for events and placing/receiving orders for marketing materials

**Undergraduate Representative for the Biological System Engineering Major** UC Davis (9/22–6/22)
- Presented to the Biological and Agricultural Engineering Department Leadership Board regarding student involvement, employment opportunities on campus and after graduation
- Implemented solutions based on student feedback, including providing the senior class with custom stoles for graduation and creating individual certificates for the department graduation brunch

**Student Ambassador for the Biological & Agricultural Engineering Department** UC Davis (9/22–6/22)
- Collaborated with the department's outreach team to work on increasing their social media presence through student Q and A posts, Instagram takeovers, TikToks, and upcoming event information
- Provided one-on-one peer mentoring for incoming freshmen and transfer students about getting involved on campus and setting up a manageable course load each quarter

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## SKILLS

**Esri MOOC Certifications:** GIS for Climate Action, Make an Impact with Modern Geo Apps
**Programming Languages:** R, Python, SQL, MATLAB, (Basic) Command Line
**Technical Software:** JupyterHub**,** SolidWorks, Shiny, Observable, AutoCAD, ArcGIS, COMSOL Multi-physics
**Project Management Software:** Git, GitHub, Trello, Dozuki, Click-Up, Slack, Discord, Zoom, Canva
**Hardware:** mill, lathe, laser cutter, powder coating, soldering, TIG and oxyacetylene welding, 3D printing
**Safety Training:** Autoclave Safety, Hazardous Waste Management and Minimization, Proper Handling of Materials at Biosafety Level 1, Biological Safety Cabinet, Fume Hood, Lockout/Tagout, and Electrical Safety