

# Katerina Bischel

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## EDUCATION

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**Master of Environmental Science and Management (M.E.S.M.)** June 2026  
University of California, Santa Barbara  
Concentration: Pollution Prevention and Remediation, Water Resource Management

**Bachelor of Environmental Studies (B.A.)** June 2024  
University of California, Santa Barbara  
Concentration: Water Quality/Systems

## TEACHING EXPERIENCE

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**Teaching Assistant** – MCDB 111 Human Physiology, UCSB Aug 2025-Sept 2025

- Taught core physiological concepts including thermoregulation, muscle function, cardiovascular dynamics, and endocrine systems, using case studies to connect theory to practical applications
- Led three weekly discussion sections, proctored midterm and final exams, and created customized PowerPoint slides incorporating case studies and worksheets

**Teaching Assistant** – EEMB 2LL Intro to Bio Lab, UCSB Mar 2025-June 2025

- Taught diverse biology labs in molecular techniques, microbial classification, evolution (*Drosophila*), plant and protist identification, and marine intertidal ecology, incorporating microscopy
- Mentored students in experimental design, data analysis (R, Google Sheets), and scientific writing for multi-week research projects culminating in formal reports and presentations

**Teaching Assistant** – EEMB 146 Biometry, UCSB Jan 2025-Mar 2025

- Taught R-based statistical analysis including ANOVA, regression, and data visualization
- Created instructional materials and managed course content in Canvas, providing student support

## RESEARCH & TECHNICAL EXPERIENCE

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**Pollinator Analysis with CNN** – AI Model Development Research May 2025-Present

- Trained YOLOv8 object detection model integrated with Hybrid Detection and Tracking (HyDaT) algorithm to identify and track pollinator visitation times on rare coastal species, Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*) and salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*)
- Processed 200+ hours of camera trap footage with human ground-truthing; mentored and trained two undergraduates in field collection protocols; advised by Dr. Katja Seltsmann (Director, Cheadle Center) and Dr. Chris Evelyn; research slated for publication in *Advanced Intelligent Systems*

**Pilcomayo River Heavy Metal Contamination** – Masters Thesis Mar 2025-Present

- Investigated heavy metal contamination (arsenic, lead, cadmium, mercury) in the Pilcomayo River Basin (Bolivia, Argentina, Paraguay), initiated through a paid summer internship sponsored by AMTSK (Advanced Minerals Technology S. Korea, Inc.); developed project website <https://katerinabischell.github.io/riverremedy/>
- Conducted spatiotemporal analysis of water and sediment samples from 39 monitoring stations across 500+ km over 8 years, integrating advanced statistical modeling and geospatial techniques; advised by Arturo Keller

**Using CaCO<sub>3</sub> from Discarded Bivalves to Enhance OA** – Senior Thesis Sep 2023-May 2024

- Performed ocean water quality analysis using bivalve shells, focusing on pH and oxygen levels
- Engineered and tested shell dispersion methods in controlled tank experiments and collaborated with seafood industries for sustainable marine restoration efforts

**Research Assistant/Lab Intern** – Susan Mazer Lab, UCSB May 2023-Dec 2023

- Investigated genetic variation and fitness of *Nemophila menziesii* across generations with Fisher's Fundamental Theorem
- Prepared specimens for isotope analysis and measured morphological traits using ImageJ

**Research Assistant** – Cheadle Center, UCSB Jan 2023-Sept 2023

- Executed field studies and DNA metabarcoding analysis of *Bombus vosnesenskii* for plant-pollinator interaction
- Maintained field sampling protocols and performed statistical analysis using R

**Aquatic Invertebrate Intern** – Cheadle Center, UCSB May 2023-Aug 2023

- Identified aquatic invertebrates and collected water samples using standardized protocols
- Operated YSI meter equipment for water quality analysis, applied microscopy and taxonomic keys

**California Coastal Water Quality Explorer** – Shiny App Development Jan 2025-Mar 2025

- Developed interactive tool analyzing coastal water quality using CalCOFI, EPA, and USGS data
- Implemented time series analysis, spatial mapping, and advanced statistical modeling

**Global Air and Water Quality Analysis** – GIS Research Project Jan 2025-Mar 2025

- Conducted spatial analysis of atmospheric NO<sub>x</sub> and global water quality using NASA and GEMStat data
- Generated comprehensive maps and statistical reports using geospatial overlays

## SKILLS & AFFILIATIONS

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**Technical Skills:** R/RStudio, Python, GIS, Shiny App, GitHub, Overleaf, Microsoft Office Suite, Google Suite, Statistical Analysis, Scientific Writing

**Leadership:** Seedlings Chapter Lead, Climate Ambassador (Global Pledge), Volunteer Educator (Sea Center)