

Exponent®
Engineering & Scientific Consulting

Micah Swann, Ph.D.

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Professional Profile

Dr. Micah Swann specializes in physical limnology. He brings over ten years of experience utilizing hydrodynamic modelling, field observations, laboratory experimentation, and remote sensing tools to understand the physical mixing and transport processes that influence water quality and ecological health in aquatic environments.

Dr. Swann's doctoral research focused on investigating the climatic drivers of vertical mixing events and their impacts on nutrient cycling and oxygen dynamics in large, temperate lakes across California and in Chile. He utilized a combination of high-frequency monitoring, laboratory experimentation, hydrodynamic lake modeling, and remote sensing analysis to examine how mixing events can contribute to harmful algal blooms in eutrophic systems.

Dr. Swann's consulting experience includes implementing industrial, watershed, and surface water quality monitoring programs in California including managing industrial and municipal stormwater permitting and compliance, drafting baseline water quality assessments, and overseeing monitoring well construction and development for groundwater remediation programs.

Academic Credentials & Professional Honors

Ph.D., Civil and Environmental Engineering, University of California, Davis, 2023

M.S., Civil and Environmental Engineering, University of California, Davis, 2022

B.S., Geology and Biology, Brown University, 2014

ARCS Foundation Scholar 2021 – 2023

California Lake Management Society Scholarship 2019

Prior Experience

Graduate Research, University of California Davis Tahoe Environmental Research Center, 2018 – 2023

Teaching Assistant, University of California Davis, 2019 - 2022

Water Resources Technical Professional, Amec Foster Wheeler, 2014 - 2018

Publications

Swann, M., Cortes, A., Forrest, A. L., Framsted, N., Sadro, S., Schladow, S. G., & De Palma-Dow, A. (2024). Internal phosphorus loading alters nutrient limitation and contributes to cyanobacterial blooms in a

polymictic lake. Aquatic Sciences, 86(2), 46.

Cortés, A., Forrest, A. L., Sadro, S., Stang, A. J., Swann, M., Framsted, N. T., ... & Schladow, S. G. (2021). Prediction of hypoxia in eutrophic polymictic lakes. Water Resources Research, 57(6).

Presentations

Swann, M. 2024. Internal Phosphorus Loading Alters Nutrient Limitation and Contributes to Cyanobacterial Blooms in a polymictic Lake (oral presentation). Clear Lake Science Symposium, Upper Lake, CA, August 15, 2024.

Swann, M. 2023. Driver of Harmful Cyanobacterial Blooms in California's Oldest Lake (poster). ARCs Foundation Northern California Symposium, San Francisco, CA, April 17, 2023.

Swann, M. 2022. Hydrodynamic Modelling to Inform Sustainable Lake Management in Northern Patagonia (poster). ARCs Foundation Northern California Symposium, San Francisco, CA, April 28, 2022.

Swann, M. 2022. Hydrodynamic Modelling to Inform Sustainable Lake Management in Northern Patagonia (invited talk). Universidad de los Andes, Santiago, Chile. March 11, 2022.

Swann, M. 2021. Modelling the Effects of Land Development and Climate Change on Patagonian Lakes (virtual). CALMs webinar, July 28, 2021.

Swann, M. 2018. Assessing the Impacts of the Mendocino Complex Fires on Sediment and Nutrient Loading (oral presentation). CALMS Annual Conference, San Diego, CA, October 10, 2019.

Project Experience

Nutrient Loading

Developed basin-wide phosphorus budget for 303(d) listed impaired water body. Conducted incubation experiments to determine oxic and anoxic phosphorus release rates from lake sediments. Aggregated historical and on-going watershed and in-lake datasets to develop annual estimates of external and internal nutrient loads.

Climate Change Impact Studies

Wrote MATLAB script to downscale regional climate forecasts of South America. Calibrated and validated PSi3D model of a deep, monomictic lake and ran multi-decadal climate simulations to investigate long-term changes in lake mixing regime. Analyzed multi-decadal timeseries of vertical temperature measurements to determine drivers of deep winter mixing events in an oligomictic lake.

Dispersion Modeling

Employed Lagrangian particle tracking model to simulate transport of contaminants discharged from shoreline wastewater treatment plants to large lake.

Acoustic Survey

Conducted bathymetric survey of drinking water reservoir to develop reservoir storage table and investigate the impacts of wildfire on sedimentation rates. Post-processed acoustic data to visualize historical stream network in flooded river valley.

Surface Water Quality Assessments

Synthesized multi-year measurements of turbidity, metals and nutrient water quality data from a stream network to develop baseline assessment of stream health prior to highway construction project. Collected and analyzed marine sediment and water quality samples pre- and post-pier demolition to assess environmental impacts of blasting.

Stormwater

Wrote industrial stormwater pollution prevention plans for concrete manufacturer stormwater permits. Conducted stormwater sampling events and annual site compliance review for locomotive maintenance facility. Oversaw environmental inspections of automotive repair and food service facilities for municipal stormwater compliance program.

Peer Reviews

Water Resources Research