Postdoctoral Researcher Positions Available: phytoplankton, harmful algal blooms, remote sensing, and nutrients

The Biogeochemistry Group (BGC) at the U.S. Geological Survey California Water Science Center (CAWSC) is *seeking candidates for up to 3 Postdoctoral Researcher positions* to work with our research team on projects related to phytoplankton, harmful algal blooms, remote sensing, nutrients, and hydrodynamic effects on biogeochemical processes in estuaries. The successful applicant will join an energetic research group studying nutrient biogeochemistry and algal ecology in the San Francisco Estuary.

Research in the Biogeochemistry Group (BGC)

The BGC group conducts research on biogeochemical processes impacting phytoplankton (abundance and community composition, beneficial and harmful) and nutrients (concentrations and forms), to evaluate their effects on ecosystem health, drinking water quality, and other topics. Because much of our research is conducted in tidally dynamic systems, we also investigate the role of physical dynamics and water residence time. These projects often involve development of new approaches, methods, and applications. For example, one aspect of our research is to develop methods for in-situ and remote optical techniques for monitoring short- and long-term water quality trends. These optical sensors measure a host of biogeochemical parameters at timescales able to resolve short-term physical dynamics while also capturing long-term trends – including those that may go undetected through traditional discrete sampling. The BGC Group also employs novel high-resolution boat-based mapping surveys, conducting intensive sampling for a diverse variety of biogeochemical parameters throughout the San Francisco Estuary and Delta. In 2021, the USGS San Francisco Bay Research and Water Quality Program (link) moved to the BGC. The group is excited to build on the 40+ year USGS of ecological monitoring and research in San Francisco Bay and add the R/V Peterson to our fleet of research vessels.

Our studies help resource managers 1) assess ecosystem responses to management actions and climate forcing and 2) develop models projecting how aquatic habitats may respond to climate change, increasing agricultural intensity, growing population density, and flow management. A major component of our research is a network of high frequency, real-time monitoring stations that act as an early warning system for unanticipated, short-lived, or rapidly changing conditions, such as those due to spills, harmful algal blooms, and altered water-quality resulting from storms or levee breaches. The BGC group additionally specializes in the creation of novel data dissemination techniques (BGC data portal), ultimately aiming to advance Bay-Delta science. The group is closely integrated into the vibrant research community in the Bay-Delta, which includes close collaborations with scientists from State and Federal agencies, academic institutions (UC Davis, Stanford, UC Santa Cruz, San Francisco State University, etc.), and other entities (e.g., San Francisco Estuary Institute).

Current BGC research projects:

- Impact of drought and hydrology on toxic cyanobacteria in the Delta

- Statistical modeling and time series analysis of environmental drivers of beneficial and harmful algal blooms
- Landscape-level assessments of nitrate and ammonium use by phytoplankton communities
- Sensor development for early detection of cyanobacterial blooms
- Using high frequency in situ sensors to measure phytoplankton community composition
- Using hyperspectral data for measuring water quality
- Remote sensing of water quality in reservoirs, inland waters, the SF Delta and Estuary.
- Ground-truthing remote sensing algorithms for water quality constituents, including HABs, chlorophyll and cDOM.
- Spatial variability and drivers of phytoplankton blooms in San Francisco Bay
- Sources of microcystins to San Francisco Bay

Research duties
The candidates will be expected to help lead one of the research projects listed above and write peer-reviewed manuscripts and collaborate with other projects. While we welcome applicants from diverse backgrounds, we are particularly interested in growing our expertise in remote sensing/bio-optics, estuarine ecology, and molecular ecology. In addition to leading existing projects, the candidate will also have opportunities to write grants and develop new research projects in collaboration with PIs in the BGC.

Qualifications
The applicant must be a U.S. citizen and have earned a Ph.D. in Biology, Ecology, Oceanography, Limnology, Engineering, or other relevant field within the past 5 years. Applicants must have experience relevant to the projects and research duties listed above and a strong publication history. Data management and analysis skills (R, Python, etc.) and manuscript preparation skills are required, and experience with fieldwork, especially boat-based, is desired. The applicant will be expected to relocate to the greater-Sacramento or Bay Area in Northern California.

How to apply
Applicants must email a cover letter stating research interests and career goals, current curriculum vita, and copies of academic transcripts and relevant publications. When prompted, please provide names, phone numbers, and email addresses of three professional references. Only complete application materials will be considered. Salary will be at a GS-12 level.

We will begin reviewing potential candidates on June 3, 2022, but we can continue to receive applications until these positions are filled.

To submit your application materials, or if you have any questions about this announcement, please email Keith Bouma-Gregson, kbouma-gregson@usgs.gov.