



Areas of Specialization

Great Lakes Limnology
Environmental Monitoring
Sediment Biogeochemistry
Shallow Groundwater Flow
Coastal and Marine Geology
Environmental History
Environmental Law

Licensed Prof. Geologist

California, Utah, Alabama,
Florida

Education

PhD, Geology, University of
California at Berkeley, 1997

Sc.B, Geology-Chemistry,
Brown University, 1987

Employment History

LimnoTech, Ann Arbor, MI
2015-pres.; Sr. Scientist

NOAA-Grt. Lakes Env. Res. Lab
2011-15; Dep. Director/Dir.

USGS-Woods Hole, MA
1997-2011; Sprvsr. Geologist

UC-Berkeley, Lawr. Berkeley
Nat. Lab, Grad Stud Rsrch
1994-97

ERM-West, Inc., Walnut Creek,
CA, 1994-95, Sr. Env. Geol

Balsam Enviro. (now AECOM),
Salem, NH, 1991-93, Proj.
Geologist

Roy F. Weston, Inc., Concord,
NH, 1988-91, Asst. Proj. Geol

John F. Bratton, Ph.D., P.G., is a Senior Science Officer at LimnoTech with broad expertise in earth and environmental sciences, including successful leadership of projects involving large ecosystem monitoring and restoration with a nutrient reduction focus, remedial investigations for contaminated sites, and litigation support. He has worked as a consultant, researcher, educator, and science manager for over 30 years, especially in the Great Lakes, Pacific, and Northeast regions, and has contributed to over 150 widely-cited scientific publications and research products. His publications cover numerical modeling, groundwater-surface water interaction and contaminant transformations, coastal and marine geology, ocean and freshwater sediment biogeochemistry, environmental history on decade to century scales, sea level change, and environmental law and policy.

Dr. Bratton previously served as Deputy Director and Acting Director of NOAA's Great Lakes Environmental Research Laboratory, and as a research group leader with the Coastal and Marine Geology Program of the U.S. Geological Survey in Woods Hole, Massachusetts. He received a doctorate from the University of California at Berkeley, and has taught undergraduate and graduate-level courses at institutions including Boston University, Au Sable Institute of Environmental Studies, Stonehill College, and Wayne State University.

Select Publications and Reports

Chaffin, J., J.D., Bratton, J.F., Verhamme, et al., 2021. The Lake Erie HABs Grab: A binational collaboration to characterize the western basin cyanobacterial harmful algal blooms at an unprecedented high-resolution spatial scale. *Harmful Algae*, 108, p.102080.

Assessment of Great Lakes Connecting Channels and their Monitoring Infrastructure, 2020, prepared for U.S. Dept. of State, International Joint Commiss., Science Advisory Board, 81 p.

Nuclear Power Decommissioning Practices: Case Studies and Recommendations for the Great Lakes Basin, 2019, prepared with PHE, Inc. for U.S. Dept. of State, International Joint Commission, Water Quality Board, 99 p.

Literature Summary to Support the Utah Lake Water Quality Study, 2018, prepared for Utah Department of Environmental Quality, Division of Water Quality, 48 p.

Klump, J. Val, John Bratton, et al. 2018. Green Bay, Lake Michigan: A proving ground for Great Lakes restoration, *J. Great Lakes Research*, 44:825-828.

Understanding Declining Offshore Productivity in the Great Lakes, 2018, prepared for Canada Ministry of Trade and Foreign Affairs, International Joint Commiss., Science Advisory Board, 84 p.

Summary of external review of CWA Sec. 316(b) entrainment reduction strategy documents (r)(10)-(12), for Donald C. Cook Nuclear Plant, Lake Michigan.

Szymczycha, B., K.D. Kroeger, J. Crusius, and J.F. Bratton. 2017. Depth of the vadose zone controls aquifer biogeochemical conditions and extent of anthropogenic nitrogen removal. *Water Research*, 123:794-801.

Review of: *Scientific Basis to Assess the Effects Effects of Nutrients on San Francisco Bay Beneficial Uses*, 2016, prepared for Bay Area Clean Water Agencies, 16 p.

Integrated Modeling for Adaptive Management of Estuarine Systems, 2016, Report to the National Science Foundation on Workshop, Univ. of Calif. – Davis, May 21-22, 2015, 43 p.

Verhamme, E.M., T.M. Redder, D. Schlea, J. Grush, J.F. Bratton, J.V. DePinto. 2016. Development of the Western Lake Erie Ecosystem Model (WLEEM): Application to connect phosphorus loads to cyanobacteria biomass. *Jour. of Great Lakes Research*, 42(6):1193-1205.



Key Project Experience

U.S.-Canada "State-of-the-Science" Assessments.

Dr. Bratton has managed more than 10 assessment projects from 2016 to present for the U.S.-Canada International Joint Commission (IJC) and supported government agencies and Great Lakes Water Quality Agreement annex committees that required synthesis of the most recent research results for the Great Lakes and other transboundary basins. This work has included assessments of the following subjects: basin-wide groundwater-surface water modeling, early warning systems, 30-year horizon planning, community science standards, Great Lakes decadal science planning, Lake Huron science planning, connecting channel science and monitoring, nuclear power plant decommissioning, impacts of multiple stressors on aquatic ecosystems, information coordination and flow, Great Lakes trophic status, fertilizer and manure impacts from the U.S. and Canada on Lake Erie water quality, impacts of unrefined liquid hydrocarbons on aquatic ecosystems, declining offshore fisheries, pathogenic bacteria impacts on coastal waters, and increasing flood resiliency of the Lake Champlain-Richelieu River basin.

Great Lakes Observing System (GLOS) Support.

Dr. Bratton oversaw the GLOS data management and communications support contract, and is managing the GLOS Ocean Technology Transition project for the Lake Erie Harmful Algal Bloom Early Warning System. The binational GLOS monitoring network includes real-time instruments on fixed structures and buoys throughout the Great Lakes, with a particular focus on Lake Erie. LimnoTech responsibilities have included subcontractor team management, deploying and recovering observing system assets, developing and maintaining web-based data delivery products, and coordinating data streams, data services, and ongoing system optimization and enhancement for user and data provider needs.

Characterizing and Restoring Contaminated Sites.

Dr. Bratton has been involved in all phases of site investigations and remediation work for clients from New Jersey to Maine, the Upper Midwest, as well as in California, Oregon, and Washington. He has worked with contaminants including PCBs, PFAS, dioxins and furans, solvents, heavy metals, mercury, radioisotopes, nitrate, and petroleum products at urban harbors, landfills, waste lagoons, airports, chemical plants, tanker truck depots, wastewater treatment plants, bulk fuel storage sites, and manufacturing facilities. Dr. Bratton has also supported toxic tort litigation efforts, CERCLA negotiations, and multi-party allocations.

Incorporating Science-Based Adaptive Management into Great Lakes Restoration.

As part of the federal USEPA-led Regional Working Group, including the U.S. Army Corps of Engineers, Dr. Bratton contributed significantly to development of the *Science-Based Adaptive Management Process for Great Lakes Restoration Initiative Action Plan II* (2014). This process was designed to identify the most critical ecosystem problems in the Great Lakes, select projects to address those problems, assess effectiveness of actions implemented, and inform future restoration efforts. He has continued to support this

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program, including recent preparation of a draft binational adaptive management plan for Lake Erie.

Documenting Chesapeake Bay's Environmental History.

By collecting sediment cores and analyzing physical, geochemical, and biological proxy data from the cores, Dr. Bratton contributed to a team that helped document the detailed history of Chesapeake Bay and its watershed. A chronology was constructed that showed when the Bay transitioned from fresh to brackish water during post-glacial sea level rise, how sedimentation rates increased in the Bay after agricultural development of the watershed, and how and where seasonal hypoxia developed in Bay bottom waters as a result of excess nutrient delivery.

Other Project Experience (last 5 years)

- U.S. Environmental Protection Agency, Great Lakes National Program Office: lead author of binational Lake Erie nutrient adaptive management framework: technical reviewer of Lake Erie nutrient data management plan
- NOAA-USGS-EPA: developed an interagency common agenda on acquisition and use of advanced Great Lakes survey technologies; project technical lead and project manager for workshop planning and proceedings, white paper preparation, and draft plan writing
- NOAA National Centers for Coastal Ocean Science; co-Principal Investigator of project (1) led by Ohio State University titled: Linking process models and field experiments to forecast algal bloom toxicity in Lake Erie; and project (2) led by Bowling Green State University titled: Portable toxin detection technology to support Great Lakes decision support tools
- Michigan Department of Environment, Great Lakes, and Energy: technical team support and writing lead for Michigan Adaptive Management Plan for Lake Erie
- South Florida Water Management District: technical support subcontract manager for science and research related to managing Lake Okeechobee and Everglades
- State of Michigan: task technical lead for governmental cost estimation for worst-case release for project titled: Independent Risk Analysis for the Straits of Mackinac Pipelines, subcontract to Michigan Technological University
- Bay Area Clean Water Agencies, led review of the Scientific Basis to Assess the Effects of Nutrients on San Francisco Bay Beneficial Uses
- Utah Dept. of Environmental Quality, Literature summary to support the Utah Lake Water Quality Study; technical reviewer
- Coastal States Organization, Washington, DC: technical team member for geospatial data synthesis; eight planning workshops in Great Lakes states for coastal habitat restoration projects
- American Electric Power, Inc.: managed external peer review of CWA 316(b) permit application related to alternatives for mitigation of fish entrainment for cooling water intakes, D.C. Cook Nuclear Plant, Lake Michigan