

Don F. Charles, PhD

Senior Scientist and Section Leader, Phycology Section, Patrick Center for Environmental Research

Additional Site: <http://diatom.acnatsci.org/>



Education:

- BS, Biological Sciences, SUNY College of Environmental Science and Forestry, 1971
- BF, Syracuse University, 1971
- MS, Major: General Ecology (Aquatic Sciences); Minor: Environmental Quality, Cornell University, 1974
- PhD, Major: Ecology and Evolutionary Biology (Limnology), Minor: Public and Environmental Affairs, Indiana University, 1982

Research Interests:

My research focuses on the ecology of freshwater diatoms and their use as ecological indicators to understand and assess current and past environmental conditions. Most current projects concern state- and national-level monitoring and assessment of river water quality. Others use diatom remains in lake sediments to determine the ecological effects of land-use alteration, eutrophication, and climate change.

My research team also focuses on taxonomy of freshwater algae, particularly diatoms, their distribution in the U.S., and the environmental factors influencing their occurrences. They also regularly describe new species of diatoms and manage the North American Ecological Database (NADED), the ANSP Algae Image Database and website, and the Diatom Paleolimnology Data Cooperative.

Bio:

Don Charles, PhD, currently leads the Patrick Center's Phycology Section, which has a staff of eight, including four PhD scientists. He has published 60 peer-reviewed scientific articles and over 75 other articles and technical reports. He has made or co-authored over 200 presentations at scientific meetings.

Before coming to the Academy, Charles was Aquatic Ecologist with the NY State Adirondack Park Agency, Assistant and Associate Scientist in the Biology Department at Indiana University, and university-cooperator Limnologist and Team Leader at the U.S. EPA Environmental Research Laboratory in Corvallis, OR. He was co-coordinator of the Paleocological Investigation of Lake Acidification (PIRLA) project, a large multi-investigator study of the effects of acidic deposition on low-alkalinity lakes in four regions of the country.

His recent and ongoing research projects continue the approach used in PIRLA of analyzing diatom assemblages in sediment cores to infer past ecological conditions, primarily to address environmental issues such as eutrophication, land-use alteration and climate change. Charles and

his research group also are analyzing diatom and soft-algae as part of several federal, state and corporate river monitoring programs. Most of these programs are designed to assess water quality conditions and help regulatory agencies develop improved biological indicators and criteria for use in protecting aquatic ecosystems.

Selected Publications:

- Battarbee, R. W., D. F. Charles, B. F. Cumming, C. Bigler, and I. Renberg. 2010. Diatoms as indicators of surface water acidity. Pages 98 - 121 In *The diatoms: Applications for the environmental and earth sciences*. Second Edition. Smol, J.P. and E.F. Stoermer, eds. Cambridge University Press, Cambridge. ISBN 978-0521509961
- Nierzwicki-Bauer, S. A., C. W. Boylen, L. W. Eichler, J. P. Harrison, J. W. Sutherland, W. Shaw, R. A. Daniels, D. F. Charles, F. Acker, T. J. Sullivan, B. Momen, and P. Bukaveckas. 2010. Acidification in the Adirondacks: Defining the biota in trophic levels of 30 chemically diverse acid-impacted lakes. *Environmental Science and Technology* 44 (15): 5721–5727. DOI 10.1021/es1005626
- Ponader, K. C., D. F. Charles, T. J. Belton, & D. M. Winter. 2008. Total phosphorus inference models and indices for coastal plain streams based on benthic diatom assemblages from artificial substrates. *Hydrobiologia* 610: 139-152. DOI 10.1007/s10750-008-9429-6.
- Potapova, M. & D. F. Charles. 2007. Diatom metrics for monitoring eutrophication in rivers of the United States. *Ecological Indicators* 7(1): 48-70. DOI 10.1016/j.ecolind.2005.10.001.
- Ponader, K. C., D. F. Charles & T. J. Belton. 2007. Diatom-based TP and TN inference models and indices for monitoring nutrient enrichment of New Jersey streams. *Ecological Indicators* 7(1): 79-93. DOI 10.1016/j.ecolind.2005.10.003.
- Sprouffske, K., D. Mellott, D. F. Charles, & M. Potapova. 2006. *Phyco-AIDE: Algal Indicators and Data Exploration*. Version 2.0. Phycology Section, Patrick Center for Environmental Research, Academy of Natural Sciences, Philadelphia, PA (computer program)
- Sprouffske, K., D. F. Charles, E. A. Morales, M. Potapova, K. C. Ponader, D. M. Winter, C. Bell, P. Cotter, R. McCourt, D. Mellott, C. Ratnayaka & D. Waterman. 2006. *Academy of Natural Sciences Online Algae Image Resources*. In: *Proceedings of the 18th International Diatom Symposium*, Mi•dzydroje, Poland.