

FRANCES QUAY DORTCH
National Oceanographic and Atmospheric Administration
National Ocean Service/National Centers for Coastal Ocean Science
Center for Sponsored Coastal Research/Coastal Ocean Program N/SC12
1305 East West Highway
Silver Spring, MD 20910
301/713-3338 ext 157 Quay.Dortch@NOAA.gov

EDUCATIONAL BACKGROUND:

B.A. with Honors, 1970, Chemistry, Randolph-Macon Woman's College, Lynchburg, VA
M.S., 1973, Biochemistry, Indiana University, Bloomington, IN
Ph.D., 1980, Biological and Chemical Oceanography, University of Washington, Seattle, WA

PROFESSIONAL EMPLOYMENT:

Coordinator, Ecology and Oceanography of Harmful Algal Bloom Program, 2003-present,
NOAA Coastal Ocean Program
Associate Professor, Louisiana Universities Marine Consortium; 1991 to 2003, Assistant
Professor, 1986 to 1991
Adjunct Faculty Appointments: Oceanography and Coastal Sciences Department, Louisiana
State University; 1987 to 2006; Biology Department, University of Louisiana at Lafayette;
1987-2002; Biology Department, Nicholls State University; 1995 to 2002; Biology
Department, University of Louisiana at Monroe; 2002
Research Scientist, Bigelow Laboratory for Ocean Sciences; 1981-1986
Senior Oceanographer III, Dept. of Oceanography; U. of Washington; 1980-1984 (intermittent)
Acting Assistant Professor, Dept. of Oceanography; U. of Washington; 1980

PUBLICATIONS

Packard, T.T. and Q. Dortch. 1975. Particulate protein-nitrogen in North Atlantic surface waters. *Mar. Biol.* 33: 347-354.
Dortch, Q., S.I. Ahmed and T.T. Packard. 1979. Nitrate reductase and glutamate dehydrogenase activities in *Skeletonema costatum* as measures of nitrogen assimilation rates. *J. Plank. Res.* 1: 169-186.
Dortch, Q. 1982. Effect of growth conditions on accumulation of internal pools of nitrate, ammonium, amino acids, and protein in three marine diatoms. *J. Exp. Mar. Biol. Ecol.* 61: 243-264.
Dortch, Q., J.R. Clayton, Jr., S.S. Thoresen, S.L. Bressler and S.I. Ahmed. 1982. Response of marine phytoplankton to nitrogen deficiency: Decreased nitrate uptake vs. enhanced ammonium uptake. *Mar. Biol.* 70: 13-19.
Dortch, Q. and H. Maske. 1982. Dark uptake of nitrate and nitrate reductase activity of a red tide population off Peru 1976. *Mar. Ecol.--Prog. Ser.* 9: 299-303.
Thoresen, S.S., Q. Dortch and S.I. Ahmed. 1982. Comparison of methods for extracting intracellular pools of inorganic nitrogen from marine phytoplankton. *J. Plank. Res.* 4: 695-704.

- Thoresen, S.S., J.R. Clayton, Jr., Q. Dortch and S.I. Ahmed. 1983. An improved method for the determination of RNA and DNA in marine phytoplankton. *J. Plank. Res.* 5: 253-261.
- Dortch, Q., T.R. Roberts, J.R. Clayton, Jr. and S.I. Ahmed. 1983. RNA/DNA ratios and DNA concentrations as indicators of growth rate and biomass in planktonic marine organisms. *Mar. Ecol.--Prog. Ser.* 13: 61-71.
- Yentsch, C.M., P.K. Horan, K. Muirhead, Q. Dortch, E. Haugen, L. Legendre, L.S. Murphy, M.J. Perry, D. Phinney, S.A. Pomponi, R.W. Spinrad, M. Wood, C.S. Yentsch and B.J. Zahuranec. 1983. Flow cytometry and cell sorting: a powerful technique with potential applications in aquatic sciences. *Limnol. Oceanogr.* 28: 1275-1280.
- Dortch, Q. and H.L. Conway. 1984. Interaction between nitrate and ammonium uptake: variation with growth rate, nitrogen source and species. *Mar. Biol.* 79: 151-164.
- Dortch, Q., J.R. Clayton, Jr., S.S. Thoresen and S.I. Ahmed. 1984. Species differences in the accumulation of nitrogen pools in phytoplankton. *Mar. Biol.* 81: 237-250.
- Dortch, Q., J.R. Clayton, S.S. Thoresen, J.S. Cleveland, S.L. Bressler and S.I. Ahmed. 1985. Nitrogen storage and use of biochemical indices to assess nitrogen deficiency and growth rate in natural plankton populations. *J. Mar. Res.* 43: 437-464.
- Dortch, Q. Biochemical indicators in a deep chlorophyll maximum. 1987. In *Biologically Influenced Chemical Systems in the Sea*, p. 705-712. Edited by L.C. Codispoti and T.T. Packard. Pergamon Press, Oxford.
- Clayton, J.R., Jr., Q. Dortch, S.S. Thoresen and S.I. Ahmed. 1988. Evaluation of methods for the separation and analysis of proteins and free amino acids in marine phytoplankton samples. *J. Plankton Res.* 10: 341-358.
- Packard, T.T., H.J. Minas, B. Coste, R. Martinez, M.C. Bonin, J. Gostan, P. Garfield, J. Christensen, Q. Dortch, M. Minas, G. Copin-Montegut, C. Copin-Montegut. 1988. Formation of the Alboran oxygen minimum zone. *Deep-Sea Res.* 35: 1111-1118.
- Dortch, Q. and J.R. Postel. 1989. Phytoplankton-Nitrogen Interactions. In *Coastal Oceanography of Washington and Oregon*. Edited by M.R. Landry and B.M. Hickey. Elsevier Science, pp. 139-173.
- Dortch, Q. and T.T. Packard. 1989. Differences in biomass structure between oligotrophic and eutrophic marine ecosystems. *Deep-Sea Res.* 36:223-240.
- Dortch, Q. and J.R. Postel. 1989. Biochemical indicators of phytoplankton N utilization during upwelling off the Washington coast. *Limnol. Oceanogr.* 34:758-773.
- Spinrad, R.W., C.M. Yentsch, J. Brown, Q. Dortch, J. Gostan, E. Haugen, N. Revelante, L. Shapiro. 1989. The response of beam attenuation to heterotrophic growth in a natural population of plankton. *Limnol. Oceanogr.* 34: 1605-1609.
- Christensen, J.P., T.T. Packard, Q. Dortch, H.J. Minas, J.C. Gascard, C. Richez, and P.C. Garfield. 1989. Carbon oxidation in the deep Mediterranean Sea: Evidence for dissolved organic carbon source. *Global Biogeochemical Cycles* 3:315-335.
- Dortch, Q. 1990. Review. Interaction between nitrate and ammonium uptake in phytoplankton. *Mar. Ecol. Prog. Ser.* 61:183-201.
- Dortch, Q., P.A. Thompson, P.J. Harrison. 1991. Variability in nitrate uptake kinetics in *Thalassiosira pseudonana* (Bacillariophyceae). *J. Phycol.* 27:35-39.
- Dortch, Q., P.A. Thompson, P.J. Harrison. 1991. Short-term interaction between nitrate and ammonium uptake in *Thalassiosira pseudonana*: effect of preconditioning N source and growth rate. *Mar. Biol.* 110: 183-193.
- Berdalet, E. and Q. Dortch. 1991. A new double staining technique for RNA and DNA measurement in marine phytoplankton. *Mar. Ecol. Prog. Ser.* 73: 295-305.

- Townsend, D.W., L.M. Mayer, Q. Dortch, and R.W. Spinrad. 1992. Vertical structure and biological activity in the bottom nepheloid layer of the Gulf of Maine. *Cont. Shelf Res.* 12: 367-387.
- Dortch, Q., and T.E. Whittedge. 1992. Nitrogen or silicon limitation in the Mississippi River plume and nearby regions. *Cont. Shelf Res.* 12: 1293-1309.
- Dortch, Q., N.N. Rabalais, R.E. Turner and G. Rowe. 1994. Respiration rates and hypoxia in the plume of the Mississippi and Atchafalaya Rivers. *Estuaries.* 17: 369-394.
- Justic, D., N.N. Rabalais, R.E. Turner, and Q. Dortch. 1995. Changes in nutrient structure of river-dominated coastal waters: the stoichiometric nutrient balance and its consequences. *Est. Coast. Shelf Science.* 40: 339-356.
- Rabalais, N. N., R. E. Turner, D. Justic, Q. Dortch, W. J. Wiseman, Jr., and B. K. Sen Gupta. 1996. Nutrient changes in the Mississippi River and system responses on the adjacent continental shelf. *Estuaries* 19: 386-407.
- Nelson, D.M., and Q. Dortch. 1996. Silicic acid depletion in the plume of the Mississippi River and limitation of Si availability to diatoms in the northern Gulf of Mexico: evidence from kinetic studies in spring and summer. *Mar. Ecol. Prog. Ser.* 136:163-178.
- Bode, A., and Q. Dortch. 1996. Uptake and regeneration of inorganic nitrogen in coastal waters influenced by the Mississippi River: spatial and seasonal variations. *J. Plankton Res.* 18:2251-2268.
- Dortch, Q., R.J. Robichaux, S. Pool, D. Milsted, G. Mire, N.N. Rabalais, T. Soniat, and G. Fryxell, R.E. Turner, and M.R. Parsons. 1997. Abundance and vertical flux of *Pseudo-nitzschia* in the Northern Gulf of Mexico. *Mar. Ecol. Prog. Ser.* 146: 249-264.
- Dortch, Q., C.A. Moncreiff, W. Mendenhall, M.L. Parsons, J.S. Franks, and K.W. Hemphill. 1998. Spread of *Gymnodinium breve* into the Northern Gulf of Mexico. In Harmful Algae, ed. by B. Reguera, J. Blanco, Ma L. Fernandez, and T. Wyatt. Xunta de Galicia and Intergovernmental Oceanographic Commission of UNESCO, GRAFISANT, Santiago de Compostela, Spain, pp. 143-144.
- Parsons, M.L., Q. Dortch, and G.A. Fryxell. 1998. A multi-year study of the presence of potential domoic acid-producing *Pseudo-nitzschia* species in the coastal and estuarine waters of Louisiana, USA. In Harmful Algae, ed. by B. Reguera, J. Blanco, Ma L. Fernandez, and T. Wyatt. Xunta de Galicia and Intergovernmental Oceanographic Commission of UNESCO, GRAFISANT, Santiago de Compostela, Spain, pp. 184-187.
- Yin, K. P. J. Harrison, Q. Dortch. 1998. Lack of ammonium inhibition of nitrate uptake for a diatom grown under low light conditions. *J. Exp. Mar. Biol. Ecol.* 228: 151-165.
- Turner, R.E., Qureshi, N, N.N. Rabalais, Q. Dortch, D. Justic', R. Shaw, and J. Cope. 1998. Fluctuating silicate:nitrate ratios and coastal plankton food webs. *Proceedings National Academy of Sciences* 95: 13048-13051.
- Rabalais, N.N., R.E. Turner, W.J. Wiseman, Jr., and Q. Dortch. 1998. Consequences of the 1993 Mississippi River Flood in the Gulf of Mexico. *Regulated Rivers: Research and Management* 14: 161-177.
- Robichaux, R.J., Q. Dortch and J.H. Wrenn. 1998. Occurrence of *Gymnodinium sanguineum* in Louisiana and Texas coastal waters, 1989-1994. In R. Zimmerman, ed., NOAA Technical Report NMFS 143: 19-25.
- Lohrenz, S.E., G.L. Fahnenstiel, D.G. Redalje, G.A. Lang, M.J. Dagg, T.E. Whittedge, and Q. Dortch. 1999. The interplay of nutrients, irradiance, and mixing as factors regulating primary production in coastal waters impacted by the Mississippi River plume. *Cont. Shelf Res.* 19: 1113-1141.

- Parsons, M.L., Q. Dortch, R.E. Turner, and N.N. Rabalais. 1999. Salinity history of coastal marshes reconstructed from diatom remains. *Estuaries* 22: 1078-1089.
- Parsons, M.L., C. A. Scholin, P.E. Miller, G. Doucette, C. L. Powell, G. Fryxell, Q. Dortch, and T. Soniat. 1999. *Pseudo-nitzschia* species (Bacillariophyceae) in Louisiana coastal waters: molecular probe field trials and domoic acid analyses. *J. Phycol* 35: 1368-1378.
- Rabalais, N.N., R.E. Turner, D. Justic, Q. Dortch, and W.J. Wiseman, Jr. 1999. Characterization of Hypoxia: Topic 1 Report for the Integrated Assessment on Hypoxia in the Gulf of Mexico. NOAA Coastal Ocean Program Decision analysis Series No. 15. NOAA Coastal Ocean Program, Silver spring, MD. 167 pp.
- Dortch, Q., M.L. Parsons, N.N. Rabalais, and R.E. Turner. 1999. What is the threat of Harmful Algal Blooms in Louisiana coastal waters? Recent Research in Coastal Louisiana: Natural System Function and Response to Human Influences, Lafayette, LA, Feb. 3-5, 1998, ed. by L. P. Rozas, J.A. Nyman, E.E. Proffitt, N.N. Rabalais, D.J. Reed, and R.E. Turner. Louisiana Sea Grant, pp. 134-144.
- Parsons, M.L., Q. Dortch, R.E. Turner, and N.N. Rabalais. 1999. The use of diatom remains as a proxy of historical salinity changes in Airplane Lake, Louisiana. Recent Research in Coastal Louisiana: Natural System Function and Response to Human Influences, Lafayette, LA, Feb. 3-5, 1998. , ed. by L. P. Rozas, J.A. Nyman, E.E. Proffitt, N.N. Rabalais, D.J. Reed, and r.e. Turner. Louisiana Sea Grant, pp. 65-78.
- Rabalais, N. N., R. E. Turner, D. Justic, Q. Dortch, W. J. Wiseman, Jr., and B. K. Sen Gupta. 2000. Gulf of Mexico biological system responses to nutrient changes in the Mississippi River. In J. Hobbie (ed.), *Estuarine Science: A Synthetic Approach to Research and Practice*, Island Press, pp. 241-268.
- Rabalais, N.N., S.E. Lohrenz, D.G. Redalje, Q. Dortch, D. Justic, R.E. Turner, N. A. Qureshi, M.J. Dagg, B.J. Eadie, and G.L. Fahnenstiel. 1999. Nutrient-enhanced coastal productivity and ecosystem responses. Nutrient Enhanced Coastal Ocean Productivity in the Northern gulf of Mexico, Understanding the effects of nutrients on a coastal ecosystem. NOAA Coastal Ocean Program Decision Analysis Series no. 14, ed. by W.J. Wiseman, Jr., M.J. Dagg, N.N. Rabalais, and T.E. Whittedge, p. 51-78
- Dortch, Q., N.N. Rabalais, R.E. Turner, and N. A. Qureshi. 2001. Impacts of Changing Si/N Ratios and Phytoplankton Species Composition. In Nancy N. Rabalais and R. Eugene Turner (eds.), *Coastal Hypoxia: Consequences for Living Resources*. Coastal and Estuarine Studies 58, American Geophysical Union, Washington, D.C., pp. 37-48.
- Pan, Y., M. L. Parsons, M. Busman, P. D. R. Moeller, Q. Dortch, C. Powell, and G.J. Doucette. 2001. *Pseudo-nitzschia* cf. *pseudodelicatissima* – a confirmed producer of domoic acid from the northern Gulf of Mexico. *Mar Ecol. Prog. Ser.* 220: 83-92.
- Parsons, M.L., Q. Dortch, and R.E. Turner. 2002. Sedimentological evidence of an increase in *Pseudo-nitzschia* (Bacillariophyceae) abundance in response to coastal eutrophication. *Limnol. Oceanogr.* 47: 551-558
- Rabalais, N.N., R.E. Turner, Q. Dortch, D. Justic, V. J. Bierman, Jr., and W.J. Wiseman, Jr. 2002. Review: Nutrient-enhanced productivity in the Northern Gulf of Mexico: Past, Present, and Future. *Hydrobiologia.* 475/476: 39-63.
- Turner, R.E., N.N. Rabalais, D. Justic, Q. Dortch. 2003. Future Aquatic Nutrient Limitations. *Marine Pollution Bulletin.* 46 :1028-1030.
- Turner, R.E., N.N. Rabalais, D. Justic, and Q. Dortch. 2003. Global patterns of dissolved N, P, and Si in large rivers. *Biogeochemistry* 64: 297-317.
- Turner, R. E., Q. Dortch, & N.N. Rabalais. 2004. Inorganic nitrogen transformations at high loading rates in an oligohaline estuary. *Biogeochemistry* 68:411-42.

- Turner, R.E., Q. Dortch, D. Justic, and E.M. Swenson. 2003. Nitrogen loading into an urban estuary: Lake Pontchartrain (Louisiana, USA). *Hydrobiologia* 487:137-152.
- Thessen, A., Q. Dortch, M. L. Parsons, W. Morrison. 2005. Effect of salinity on *Pseudo-nitzschia* species (Bacillariophyceae) growth and distribution. *J. Phycol.* 41:21-29.
- Parsons, M.L., Q. Dortch, R. E. Turner, and N.N. Rabalais. Reconstructing the development of eutrophication in Louisiana salt marshes. *Limnol. Oceanogr.*51: 534-544.
- Maier Brown, A.F., Q. Dortch, F.M. VanDolah, T.A. Leighfield, W. Morrison, A.E. Thessen, K. Steidinger, B. Richardson, C.A. Moncreiff, and J.R. Pennock. 2006. Effect of salinity on the distribution, growth, and toxicity of *Karenia* spp. *Harmful Algae* 5:199-212.
- Sylvan, J. B., Q. Dortch, D. M. Nelson, A. F. Maier Brown, W. Morrison, and J. W. Ammerman. 2006. Phosphorus limits phytoplankton growth on the Louisiana shelf during the period of hypoxia formation. *Environmental Science and Technology* 40: 7548-7553.
- Jewett, E.B., Lopez, C.B., Dortch, Q., Etheridge, S.M. 2007. National Assessment of Efforts to Predict and Respond to Harmful Algal Blooms in U.S. Waters. Interim Report. Interagency Working Group on Harmful Algal Blooms, Hypoxia, and Human Health of the Joint Subcommittee on Ocean Science and Technology. Washington, D.C.
- Hudnell, H.K., Q. Dortch, and H. Zenick. 2008. Chapter 1. An overview of the Interagency, international symposium on Cyanobacterial Harmful Algal Blooms (ISOC-HAB): Advancing the Scientific Understanding of Freshwater Harmful Algal Blooms. In Proceedings of the Interagency, International Symposium on Cyanobacterial Harmful Algal Blooms, ed. by H.K. Hudnell, *Advances in Experimental Medicine and Biology*, p. 1-16.
- Hudnell, K.H., and Q. Dortch. 2008. Chapter 2. A Synopsis of Research Needs Identified at the Interagency, International Symposium on Cyanobacterial Harmful Algal Blooms (ISOC-HAB). In Proceedings of the Interagency, International Symposium on Cyanobacterial Harmful Algal Blooms, ed. by H.K. Hudnell, *Advances in Experimental Medicine and Biology*, p. 17-35.
- Perovich, G., Dortch, Q., Goodrich, J., Berger, P.S., Brooks, J., Evens, T.J., Gobler, C.J., Graham, J., Hyde, J., Karner, D., O'Shea, D., Paul, V., Paerl, H., Piehler, M., Rosen, B.H., Santelmann, M., Tester, P., Westrick, J. 2008. Causes, prevention, and mitigation Work Group Report. In Proceedings of the Interagency, International Symposium on Cyanobacterial Harmful Algal Blooms, ed. by H.K. Hudnell, *Advances in Experimental Medicine and Biology*, p. 182-213.
- Doucette, G.J., K.L. King, A.E. Thessen, Q. Dortch. 2008. The Effect of salinity on domoic acid production by the diatom *Pseudo-nitzschia multiseriata*. *Nova Hedwigia* In press.