

CURRICULUM VITA

CHRISTOPHER LEE OSBURN

Assistant Professor
Dept. of Marine, Earth, and Atmospheric Sciences
North Carolina State University
closburn@ncsu.edu
919-515-0382 (office)
919-600-1386 (mobile)

EDUCATION

2000, Ph.D., Environmental Science, Lehigh University (Advisor: Dr. Donald P. Morris)
1995, B.A., Geological Sciences, Indiana University
1991, B.S., Public Affairs, Indiana University

PROFESSIONAL EXPERIENCE

2008-present Assistant Professor, Dept. of Marine, Earth, and Atmospheric Sciences, North Carolina State University
2003 – 2008 Research Chemist, US Naval Research Laboratory
2000 – 2003 National Research Council Postdoctoral Fellow, US Naval Research Laboratory

RESEARCH INTERESTS

- Flux and Biogeochemistry of Dissolved Organic Matter studied via optical (absorption and fluorescence spectroscopy) and chemical (stable and radioisotopes, lignin) properties
- Photodegradation and microbial degradation of organic matter
- Thermodynamics of carbon cycling

SCIENTIFIC CRUISES

Chesapeake Bay (8 cruises 2000-2006, aboard R/V Cape Henlopen and R/V Sharp; 2 as Chief Scientist)
San Francisco Bay (2 cruises 2002 and 2003, aboard R/V Point Sur)
Puget Sound (2 cruises 2005 and 2006, aboard R/V *Barnes*)
Baltic Sea (2007, aboard R/V *Gunnar Thorsen*)
Mackenzie River estuary (2004, aboard CCGS Nahidik)
Gulf of Mexico (2000, aboard R/V *Seward Johnson* and 2007, aboard R/V Pelican)
Charleston Harbor (2 cruises 2001, aboard R/V *Cape Hatteras*)

TEACHING EXPERIENCE

Natural Hazards and Global Change (undergraduate)
Earth System Chemistry (undergraduate)
Organic Geochemistry (graduate)

CURRENT AND PRIOR FUNDING

1. PENDING “Geospatial Synthesis of Chromophoric Dissolved Organic Matter Distribution in the Gulf of Mexico for Water Clarity Decision Making”, NASA, PI, \$424,208
2. PRIOR “Chemical Analysis of CDOM Sources in Danish Coastal Waters of the Baltic Sea-North Sea Mixing Zone,” Office of Naval Research, \$75,162, 2008
3. PRIOR – “Quantitative and qualitative prediction of light absorption by colored dissolved organic matter in the coastal zone”, Office of Naval Research, Co-PI with Colin Stedmon (Danish NERI), \$129,522 (\$267,809 total), 2006-2008
4. PRIOR – “Thermodynamic Approach to Carbon Cycling in the Littorals,” Naval Research Laboratory Young Investigator Program, \$183,550, 2005-2007
5. PRIOR - “The Role of Dissolved Organic Matter in Regulating Primary Production in Prairie Saline Lakes,” National Science Foundation, Co-PI with Jasmine Saros and Sherilyn Fritz, \$75,000 (\$250,000 total), 2003-2005.
6. PRIOR - “Cometabolism of PAHs, TNT and terrestrial organic matter (TOM) in coastal battlespace environments,” Office of Naval Research, Co-PI with M. Montgomery, \$100,000 (\$271,430 total), 2002-2004.
7. PRIOR - “Influence of terrestrial organic matter from the Mackenzie River on coastal battlespace optical properties in the Southeastern Beaufort Sea & Mackenzie Shelf,” Office of Naval Research, \$83,870, 2003-2004.

PEER REVIEWED PUBLICATIONS

- Osburn, C.L., Retamal, L., and Vincent, W.F. (accepted) Photoreactivity of chromophoric dissolved organic matter transported by the Mackenzie River to the Beaufort Sea. *Marine Chemistry*.
- Osburn, C.L., O'Sullivan, D.W., and Boyd, T.J. (2009) Increases in the longwave photobleaching of chromophoric dissolved organic matter in coastal waters. *Limnology and Oceanography*. 54: 145-159.
- Montgomery, M. T., Osburn, C. L., Furukawa, Y., Ziebis, W., Mahn, C., and Gieskes, J. M. (in press). Increased capacity for PAH mineralization in biologically-mixed estuarine sediments. *Environmental Monitoring and Assessment*.
- Boyd, T.J, Smith, D.C., Apple, J.K., Hamdan, L.J., Osburn, C.L., and Montgomery, M.T. (2008) Evaluating PAH Biodegradation Relative to Total Bacterial Carbon Demand in Coastal Ecosystems: Are PAHs Truly Recalcitrant? In: *Microbial Ecology Research Trends*, T Van Dijk (ed), pp. 1-38. NOVA.
- Montgomery, M.T., Osburn, C.L., Furukawa, Y., and Gieskes, J. (2008) Increased capacity for polycyclic aromatic hydrocarbon mineralization in bioirrigated coastal marine sediments. *Bioremediation Journal*, 12: 98-110.
- Tzortziou, M., Neale, P.J., Osburn, C.L., Megonigal, P.J., Maie, N., and Jaffe, R. (2008) Tidal marshes as a source of optically and chemically distinctive colored dissolved organic matter in the Chesapeake Bay. *Limnology and Oceanography*, 53: 148-159.
- Vallieres, C., Retamal, L., Ramlal, P., Osburn, C.L., and Vincent, W.F. (2008) Bacterial production and microbial food web structure in a large arctic river and the coastal Arctic Ocean. *Journal of Marine Systems*, 74: 756-773.
- Osburn, C. L. and St-Jean, G. (2007) Stable isotope analysis of dissolved organic carbon in seawater using TOC-IRMS. *Limnology and Oceanography: Methods*, 5: 296-308.
- Retamal, L., Vincent, W.F., Martineau, C., and Osburn, C.L. (2007) Comparison of the optical properties of dissolved organic matter in two river-influenced coastal regions of the Canadian Arctic. *Estuarine, Coastal and Shelf Science*, doi:10.1016/j.ecss.2006.10.022.
- Tzortziou, M., Osburn, C.L. and P. J. Neale. (2007) Photobleaching of dissolved organic material from a tidal marsh-estuarine system of the Chesapeake Bay. *Photochemistry and Photobiology*. 83: 782-792.
- Boyd, T.J., Osburn, C.L., Johnson, K.J., Birgl, K.B., Coffin, R.B. (2006) Compound-specific isotope analysis coupled with multivariate statistics to source-apportion hydrocarbon mixtures. *Environmental Science and Technology*, 40 (6): 1916-1924.
- Maloney, K. O., Morris, D. P., Moses, C. O., and Osburn, C. L. (2005). The role of iron and dissolved organic carbon in the absorbance of ultraviolet radiation in humic lake water. *Biogeochemistry*, 75: 393-407.
- O'Sullivan, D. W., Neale, P. J., Coffin, R. B., Boyd, T. J., and Osburn, C. L. (2005) Photochemical production of hydrogen peroxide and methylhydroperoxide in coastal waters. *Marine Chemistry*, 97(1-2): 14-33.
- Boyd, T. J. and Osburn, C. L. (2004). Changes in CDOM fluorescence from allochthonous and autochthonous sources during tidal mixing and bacterial degradation in two coastal estuaries, *Marine Chemistry*, 89:189-210.
- Osburn, C. L. and Morris, D. P. (2003). Photochemistry of chromophoric dissolved organic matter in natural waters, In: *UV Effects in Aquatic Organisms and Ecosystems*, Hebling, W. E. and Zagarese, H. E. (eds.), Royal Society of Chemistry, 500 pp.
- Montgomery, M. T., Osburn, C. L., Boyd, T. J., Smith, D. C., and Mueller, J. C. (2002). Seasonal succession of the PAH-mineralizing bacteria in creosote-impacted intertidal sediments. *Soil and Sediment Contamination* 11(3): 479.
- Osburn, C. L., Morris, D. P., Moeller, R. E., and Thorn, K.A. (2001). Chemical and optical changes in freshwater dissolved organic matter exposed to solar radiation. *Biogeochemistry*, 54(3): 251-278.
- Osburn, C. L., Zagarese, H. E., Morris, D. P., Hargreaves, B. R., and Cravero, W. (2001). Calculation of spectral weighting functions for the photobleaching of chromophoric dissolved organic matter in temperate lakes. *Limnology and Oceanography*, 46(6): 1455-1467.
- Bralower, T.J., CoBabe, E.A., Clement, B., Sliter, W.V., Osburn, C. L., and Longoria, J. (1999). The record of global change in mid-Cretaceous (Barremian-Albian) sections from the Sierra Madre, Northeastern, Mexico. *Journal of Foraminiferal Research*, 29(4): 418-437.

SELECT PAPERS PRESENTED SINCE 2004

- Osburn, C.L. and C. A. Stedmon. 2008. Resolving optical and chemical measurements of terrestrial DOM flux in the North Sea-Baltic Sea mixing zone. ASLO/AGU/TOS/ERF Ocean Sciences Meeting. Orlando, FL, 2-9 March.
- Stedmon, C.A and C.L. Osburn. 2008. Spectral light absorption by CDOM in the North Sea-Baltic Sea mixing zone: Modelling seasonality and dependency on water mass mixing. ASLO/AGU/TOS/ERF Ocean Sciences Meeting. Orlando, FL, 2-9 March.
- Osburn, C.L. and Boyd, T.J. 2007. "Optical and Geochemical Measurements Used to Identify Dissolved Organic Matter Sources in the Chesapeake Bay." 10th International Symposium on Wetland Biogeochemistry, Annapolis, MD, April 1-4.

- Montgomery, M. T., Osburn, C. L., Walker, S. E., Boyd, T. J., Mueller, J. G., Li, Q. X., Paerl, H. W., Monteil-Rivera, F., and J. Hawari. 2007. "Biodegradation of 2,4,6-Trinitrotoluene (TNT) in coastal waters and sediments. Presentation at the 17th Annual AEHS Meeting and West Coast Conference on Soils, Sediments, and Water." San Diego, 19-22 March.
- Tzortziou, M, Neale, P, J, and Osburn, C. L., 2007. "Photochemical degradation of dissolved organic material from a tidal marsh-estuarine system: Measurements and spectral photobleaching modeling," ASLO Aquatic Sciences Meeting, 4-9 February, Santa Fe, NM.
- Neale, P. J., Tzortziou, M., Osburn, C. L. 2007. "A simple spectral model for solar photobleaching of marsh and estuarine colored dissolved organic matter (CDOM)," ASLO Aquatic Sciences Meeting, 4-9 February, Santa Fe, NM.
- Maness, S. J., T. F. Donato, C. L. Osburn, W. J. Rhea Jr., L. J. Hamdan, and S. E. Walker. 2005. Spectral deconvolution of water column features from hyperspectral remote sensing data images, ACS National Meeting, Washington, DC, August 28-September 1.
- Osburn, C. L., Hamdan, L. J., Fritz, S. C., and Saros, J. E. 2005. Variation in geochemistry and optics of DOM in prairie saline lakes. ASLO Aquatic Sciences Meeting, February 20-25. NOTE: Organized and chaired session.
- Osburn, C. L., Stedmon, C. A. and Vincent, W. F. 2004. The conservative and non-conservative properties of DOM in the Beaufort Sea. AGU Fall Meeting, San Francisco, CA, December 13-17.
- Osburn, C.L., O'Sullivan, D. W., and Vincent, W. F. Transport and Photochemical Degradation of CDOM in the Mackenzie River-Delta System. ASLO-TOS Ocean Research Conference, Honolulu, HI, February 2004.

RECENT INVITED TALKS

- "Chasing Terrestrial Dissolved Organic Matter in the Coastal Ocean with Optical and Chemical Measurements: How Well Do They Correlate?" University of Ottawa, March 2009
- "Chasing Terrestrial Dissolved Organic Matter in the Coastal Ocean with Optical and Chemical Measurements: How Well Do They Correlate?" University of South Carolina, February 2009
- "The Effects of Salinity on the Fluorescence and Photoreactivity of DOM in Coastal Environments." AGU Chapman Conference on Organic Matter Fluorescence, October 2008
- "Chasing Terrestrial Dissolved Organic Matter in the Coastal Ocean Using Lignin Phenols and Carbon Stable Isotopes," University of Maryland, September 2007

REVIEWING FOR JOURNALS AND FUNDING AGENCIES

- *Limnology and Oceanography, Limnology and Oceanography: Methods, Marine Chemistry, Aquatic Sciences, Water Research, Environmental Science & Technology, Analytical Chemistry, Organic Geochemistry, Journal of Geophysical Research, Biogeochemistry*
- National Science Foundation (Major Research Instrumentation, Ecosystems, Office of Polar Programs)
- NSF Panel Review
- Minnesota Sea Grant

STUDENTS ADVISED

- Katherine Weaver (M.S. candidate Aug 2009)