

PETER A. RAYMOND

Curriculum Vitae

Ecosystems Center
Marine Biological Laboratory
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EDUCATION

B.A., Environmental Chemistry with minor in Biology, Marist College, Poughkeepsie, N.Y.,
1989-1993

Ph.D, Marine Biogeochemistry, Physical Oceanography Department, Virginia Institute of Marine
Science, College of William and Mary, Gloucester Pt. VA. 1995-1999

PROFESSIONAL EMPLOYMENT

Post-Doctoral Scientist, Ecosystems Center, Marine
Biological Laboratory, Woods Hole, MA

Oct 1999-present

Participating Scientist, Lawrence Livermore
National Laboratory, Livermore, CA

May 1998-May 1999

Graduate Teaching Assistant, Introduction to
Oceanography, College of William and Mary.
Williamsburg, VA.

Jan.1998-May 1998

Graduate Research Assistant, for Dr. Jim Bauer, College
of William and Mary/V.I.M.S., Gloucester Point, VA.

Sept.1995-Dec.1997

Research Assistant (I), For Dr. Jon Cole, Institute of
Ecosystem Studies, Millbrook N.Y.

Oct. 1993-July 1995

Tibor T. Polgar Fellow, Hudson River Foundation,
working under Dr. Jon Cole, Millbrook N.Y.

May 1993-Sept.1993

RESEARCH INTERESTS.

Isotope geochemistry of riverine, estuarine, and oceanic carbon
Organic carbon cycling in marshes, rivers, estuaries, and oceans
Inorganic carbon cycling and air-sea exchange

HONORS AND FELLOWSHIPS

1998 mini-grant, Center for AMS, Livermore National Lab

1993 Hudson River Foundation, Tibor T. Polgar Fellow

2001 Contributor, Dissertation Initiative for the Advancement of Limnology and Oceanography
(DIALOG IV), Bermuda

PROFESSIONAL SOCIETIES

American Geophysical Union

Estuarine Research Federation

American Society of Limnology and Oceanography

PUBLICATIONS

- Raymond P.A., J. E. Bauer. 2001. Riverine export of aged terrestrial organic matter to the North Atlantic Ocean. *Nature*. **409**: 497-500.
- Raymond P.A., J. E. Bauer. 2001. DOC cycling in a temperate estuary: A mass balance approach using natural ^{14}C and ^{13}C Isotopes. *Limnol. Oceanogr.* **46**:655-667.
- Raymond P.A., J. E. Bauer. 2001. Use of ^{14}C and ^{13}C natural abundances for evaluating riverine, estuarine, and coastal DOC and POC sources and cycling: Review and Synthesis. *Org. Geochem.* **32**:469-485.
- Raymond P.A., J.J. Cole. 2001. Gas exchange in rivers and estuaries: choosing a gas transfer velocity. *Estuaries*. **24**:269-274.
- Raymond P.A., J. E. Bauer, J.J. Cole. 2000. Atmospheric CO_2 evasion, dissolved inorganic carbon production, and net heterotrophy in the York River Estuary. *Limnol. Oceanogr.* **45**:1707-1717.
- Raymond P.A., J. E. Bauer. 2000. Bacterial utilization and transport of DOC in a temperate estuary: implications for export to the coastal ocean. *Aquat. Microb. Ecol.* **22**:1-12.
- Ducklow, H.W., G.L. Schultz, P. Raymond, J. Bauer and F-K Shiah. 2000. "Bacterial and DOM dynamics in large and small estuaries." Pp 105-112 In: CR. Bell, M. Brylinsky and P. Johnson-Green, Eds, Microbial Biosystems-New Frontiers. Proc. 8th Int'l Symposium on Microbial Ecology. Atlantic Canada Society for Microbial Ecology: Halifax NS. 939pg.
- Raymond P.A., N. Caraco, J.J. Cole. 1997. Carbon dioxide concentration and atmospheric flux in the Hudson River. *Estuaries* **20**: 381-390.
- Caraco, N., J.J. Cole, P.A. Raymond, D.L. Strayer, M.L. Pace, S. Findlay, D. Fischer. 1997. Zebra mussel invasion in a large, turbid river: Phytoplankton response to increased grazing. *Ecology* **78**: 588-602.
- Raymond P.A., J.J. Cole. 1994. The use of direct carbon dioxide measurements on the Hudson River Estuary. *Final Reports of the Tibor T. Polgar Fellowship Program, 1993*. Section I.

In Prep

- Zappa C., P. Raymond, W. McGillis, E. Terray. The gradient technique for measuring gas transfer velocities in estuaries.
- Raymond P., G. Peterson, J. Vallino, C. Hopkinson. Subsurface hydrology in the creek bank of a macro-tidal estuary.
- Raymond P., J. Vallino, C. Hopkinson, J. Hobbie, B. Crump, G. Peterson. Organic Matter Cycling in the Plum Island Estuary: A coupled isotopic and 2-D hydrology model.

INVITED TALKS

- Raymond, P.A. October 2000. Carbon dioxide super-saturation and atmospheric CO_2 evasion in estuaries. WHOI, Applied Ocean Physics and Engineering department.
- Raymond, P.A. April 2000. Organic matter age and cycling in rivers and estuaries. United States Geological Survey. Menlo Park, CA. Livermore, CA.
- Raymond, P.A. April 2000. Use of ^{14}C to understand organic matter dynamics in estuaries. Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory.
- Raymond, P.A., J. Bauer. 1999. ^{14}C and ^{13}C evidence for the utilization of terrigenous DOC in the York River estuary. ERF Estuarine Research Federation, New Orleans, LA.
- Ducklow, H., G. E. Schultz, P. A. Raymond, J. E. Bauer. 1999. Bacterioplankton biomass, production, and dissolved organic matter utilization in Chesapeake Bay. EPA Chesapeake Bay Modeling Workshop on Higher Trophic Level Modelling. Annapolis, Md.
- Ducklow, H., J. Bauer, G. Schultz, P. Raymond. 1998. Bacterial and DOM dynamics in large and small estuaries. 8th International Symposium on Microbial Ecology, Halifax, NS.

RECENT ABSTRACTS

- Ruppel, C., G. Schultz, C. Tobias, P. Raymond, 2001. Coupled physical and chemical constraints on groundwater flow across the upland-estuary interface in peat and clastic settings. Geological Society of America, Boston MA.
- Raymond, P.A., W.R. McGillis, C.J. Zappa, E. Terray. 2001. Measurements of the gas exchange coefficient and atmospheric exchange of CO₂ over a tidal cycle in the Plum Island Estuary using the Gradient Flux Technique. ASLO Aquatic Sciences Meeting, Albuquerque, N.M.
- Raymond, P.A., J. Bauer. 2000. Riverine export of organic ¹⁴C to the North Atlantic Ocean. AGU Fall Meeting, San Francisco, CA.
- Zappa, C.J., W.R. McGillis, P.A. Raymond, E. Terray. 2000. Surface processes effecting aquatic atmospheric transfer in estuarine systems. AGU Fall Meeting, San Francisco, CA
- Bauer, J., P.A. Raymond (presenter), D. Wolgast, C.S. Hopkinson. 1999. ¹⁴C and ¹³C evidence for the utilization of terrigenous DOC in estuaries. ASLO Aquatic Sciences Meeting, Santa Fe, NM.
- Raymond, P.A., J. Bauer. 1999. Estimation of net metabolism in the York River Estuary using inorganic carbon measurements. ASLO Aquatic Sciences Meeting, Santa Fe, NM.
- Raymond, P., J. Bauer, D. Wolgast. 1998. Stable and radiocarbon isotopic composition of DOC in the York River Estuary, Virginia. Ocean Sciences Meeting, San Diego, CA.
- Raymond, P., J. Bauer, D. Wolgast. 1997. Sources and micro-heterotrophic utilization of DOM in the York River Estuary, Virginia. ASLO Aquatic Sciences Meeting, Santa Fe, NM.

TEACHING EXPERIENCE

- Mentored Research Experience for Undergrad (REU) student Tondra Moore during the summer of 1998. This entailed helping Tondra design a project, implement laboratory techniques, and prepare a presentation.
- Graduate Teaching Assistant (TA) for "Introduction to Oceanography (MS 330) at College of William and Mary.

CURRENT AND PENDING RESEARCH SUPPORT

- Proposal to the Rhinehart Coastal Research Center "Surface Processes Controlling Aquatic-Atmospheric Gas Transfer in Estuaries" Funded. \$38,000.
- DOE, Livermore National Laboratory, Center for AMS, "Sources and radiocarbon signatures of refractory and labile dissolved and particulate organic carbon in the York River Estuary" Funded. \$23,700. 1 year.
- NSF, DEB-Ecosystem Studies, Input and Metabolism of Ancient Carbon in a Large River (Co-PI with Jon Cole, Nina Caraco and Jim Bauer). \$449,976. Pending.
- NSF, Chemical Oceanography. CO₂ and Inorganic Carbon in Coastal Waters (Lead PI, with Wade McGillis). \$293,818. Pending.
- Hudson River Foundation, Measurements and Modeling of the Gas Transfer Velocity in the Hudson River Estuary (Lead PI with Wade McGillis, Jon Cole and Nina Caraco). \$92,000. Pending.
- Hudson River Foundation. Is Ancient Terrestrial Particulate Organic Matter being Utilized in the Hudson River? (Co-PI with Steve Petsch and Tim Eglinton). \$152,000. Pending.

REVIEWING EFFORTS

- Journals: Limnology and Oceanography, Marine Chemistry, Deep-Sea Research II, Biological Bulletin, Archiv fuer Hydrobiologie. Proposals: NSF, Chemical Oceanography, and Office of Polar Programs.

COLLABORATORS

- Dr. Chuck Hopkinson Jr, John Hobbie, Joe Vallino, and Byron Crump, Marine Biological Lab
- Dr. Wade McGillis, Gene Terray and Chris Zappa, Woods Hole Oceanographic Institute
- Dr. Jim Bauer, V.I.M.S/College of William and Mary
- Dr. Jon Cole and Nina Caraco, Institute of Ecosystem Studies
- Dr. Bob Chen, Umass Boston

REFERENCES

- Dr. Charles Hopkinson Jr., Ecosystem Center, Marine Biological Lab, Woods Hole, MA 02543 (chopkins@mbl.edu)
- Dr. James Bauer (PhD advisor), V.I.M.S/College of William and Mary, Gloucester Pt., VA 23062 (bauer@vims.edu)
- Dr. Jonathon Cole, Institute of Ecosystem Studies, Millbrook, N.Y. 12545 (ColeJ@ecostudies.org)
- Dr. John Hobbie, Ecosystem Center, Marine Biological Lab, Woods Hole, MA 02543 (jhobbie@mbl.edu)
- Dr. Hugh Ducklow, V.I.M.S/College of William and Mary, Gloucester Pt., VA 23062. (duck@vims.edu)
- Dr. Wade McGillis, Woods Hole Oceanographic Institution, Woods Hole, MA 02543 (wmcgillis@whoi.edu)