

## **Peter A. Raymond**

Professor of Ecosystem Ecology  
<http://environment.yale.edu/raymond/>  
School of Forestry & Environmental Studies  
Birthplace: 06/08/1971, Denver CO

### **College and Graduate Education:**

- 1995 – 1999      Ph.D., Doctor of Philosophy in Marine Science, Physical Sciences  
Department, Virginia Institute of Marine Science, College of William and  
Mary, Ph.D. Advisor: James Bauer
- 1993              Institute of Ecosystem Studies, Tibor T Polgar Fellow
- 1989 – 1993      Marist College, Environmental Chemistry major with Minor in Biology

### **Summary of Professional Career:**

- 2010- present      Professor of Ecosystem Ecology, School of Forestry & Environmental  
Studies, Yale University
- 2014-present      Professor, Geology and Geophysics, Yale University
- 2015              Visiting Professor, Department of Environmental Science and Analytical  
Chemistry, Stockholm University
- 2013              Visiting Professor, Laboratoire des Sciences du Climat et de  
l'Environnement IPSL-LSCE, CEA-CNRS-UVSQ, Gif sur Yvette France
- 2007 – 2010      Associate Professor of Ecosystem Ecology, School of Forestry &  
Environmental Studies, Yale University
- 2009              Visiting Scientist, Smithsonian Tropical Research Institute, Bocas del  
Toro, Panama
- 2002 – 2007      Assistant Professor of Ecosystem Ecology, School of Forestry &  
Environmental Studies, Yale University
- 2002              Post Doctoral Scientist, Applied Ocean Physics and Engineering, Woods  
Hole Oceanographic Institution
- 1999 – 2001      Post Doctoral Scientist, Ecosystems Center, Marine Biological Laboratory
- 1993-1995      Institute of Ecosystem Studies, Research Assistant

### **Professional Honors or Recognition:**

2017	Fellow American Association for the Advancement of Science (AAAS)
2017	Member Connecticut Academy of Science and Engineering
2016	Fulbright Scholar Sweden
2015	Plenary Speaker 2015 ASLO Aquatic Science Meeting
2009	Presented in the Oregon State Universities Visiting Scholar Frontiers Series
2006	Awarded NSF CAREER Grant for Faculty Early Career Development
2005	Estuarine Research Federation's Cronin Award for Young Scientist
2005	Lindeman Speaker, University of Minnesota EEB Department
2001	Contributor, Dissertation Initiative for Advancement of Limnology and Oceanography (DIALOG IV)
1993	Hudson River Foundation, Tibor T Polgar Fellow

### **Refereed Publications:**

- 1 Caraco, N.F., J.J. Cole, P.A. Raymond, D.L. Strayer, M.L. Pace, S.E.G. Findlay, et al. 1997. Zebra mussel invasion in a large, turbid river: Phytoplankton response to increased grazing. *Ecology* 78: 588-602.
- 2 Raymond, P.A., N.F. Caraco and J.J. Cole. 1997. Carbon dioxide concentration and atmospheric flux in the Hudson River. *Estuaries* 20: 381-390.
- 3 Raymond, P.A. and J.E. Bauer. 2000. Bacterial consumption of DOC during transport through a temperate estuary. *Aquatic Microbial Ecology* 22: 1-12.
- 4 Raymond, P.A., J.E. Bauer and J.J. Cole. 2000. Atmospheric CO<sub>2</sub> evasion, dissolved inorganic carbon production, and net heterotrophy in the York River estuary. *Limnology And Oceanography* 45: 1707-1717.
- 5 Raymond, P.A. and J.E. Bauer. 2001. DOC cycling in a temperate estuary: A mass balance approach using natural C-14 and C-13 isotopes. *Limnology And Oceanography* 46: 655-667.
- 6 Raymond, P.A. and J.E. Bauer. 2001. Use of C-14 and C-13 natural abundances for evaluating riverine, estuarine, and coastal DOC and POC sources and cycling: a review and synthesis. *Organic Geochemistry* 32: 469-485.
- 7 Raymond, P.A. and J.E. Bauer. 2001. Riverine export of aged terrestrial organic matter to the North Atlantic Ocean. *Nature* 409: 497-500. doi:10.1038/35054034.
- 8 Raymond, P.A. and J.J. Cole. 2001. Gas exchange in rivers and estuaries: Choosing a gas transfer velocity. *Estuaries* 24: 312-317.
- 9 Raymond, P. and J. Cole. 2003. Increased alkalinity in the Mississippi - Response. *Science* 302: 986-987.

- 10 Raymond, P.A. and J.J. Cole. 2003. Increase in the export of alkalinity from North America's largest river. *Science* 301: 88-91. doi:10.1126/science.1083788.
- 11 Raymond, P.A. and C.S. Hopkins. 2003. Ecosystem modulation of dissolved carbon age in a temperate marsh-dominated estuary. *Ecosystems* 6: 694-705.
- 12 Zappa, C.J., P.A. Raymond, E.A. Terray and W.R. McGillis. 2003. Variation in surface turbulence and the gas transfer velocity over a tidal cycle in a macro-tidal estuary. *Estuaries* 26: 1401-1415.
- 13 Raymond, P.A., J.E. Bauer, N.F. Caraco, J.J. Cole, B. Longworth and S.T. Petsch. 2004. Controls on the variability of organic matter and dissolved inorganic carbon ages in northeast US rivers. *Marine Chemistry* 92: 353-366.
- 14 Cooper, L.W., R. Benner, J.W. McClelland, B.J. Peterson, R.M. Holmes, P.A. Raymond, et al. 2005. Linkages among runoff, dissolved organic carbon, and the stable oxygen isotope composition of seawater and other water mass indicators in the Arctic Ocean. *Journal of Geophysical Research-Biogeosciences* 110.
- 15 Raymond, P.A. 2005. Carbon cycle - The age of the Amazon's breath. *Nature* 436: 469-470.
- 16 Raymond, P.A. 2005. The composition and transport of organic carbon in rainfall: Insights from the natural (C-13 and C-14) isotopes of carbon. *Geophysical Research Letters* 32. doi:10.1029/2005gl022879.
- 17 Striegl, R.G., G.R. Aiken, M.M. Dornblaser, P.A. Raymond and K.P. Wickland. 2005. A decrease in discharge-normalized DOC export by the Yukon River during summer through autumn. *Geophysical Research Letters* 32.
- 18 C. S. Garbe, R. A. Handler and B. Jahne. 2006. Air-water flux reconciliation between the atmospheric CO<sub>2</sub> profile and mass balance techniques. International Workshop on Transport at the Air Sea Interface, Heidelberg, GERMANY. Sep 06-08.
- 19 Oh, N.H. and P.A. Raymond. 2006. Contribution of agricultural liming to riverine bicarbonate export and CO<sub>2</sub> sequestration in the Ohio River basin. *Global Biogeochemical Cycles* 20.
- 20 Butman, D., P. Raymond, N.H. Oh and K. Mull. 2007. Quantity, C-14 age and lability of desorbed soil organic carbon in fresh water and seawater. *Organic Geochemistry* 38: 1547-1557. doi:10.1016/j.orggeochem.2007.05.011.
- 21 Longworth, B.E., S.T. Petsch, P.A. Raymond and J.E. Bauer. 2007. Linking lithology and land use to sources of dissolved and particulate organic matter in headwaters of a temperate, passive-margin river system. *Geochimica Et Cosmochimica Acta* 71: 4233-4250.
- 22 McGillis, W.R., J.W.H. Dacey, J.D. Ware, D.T. Ho, J.T. Bent, W.E. Asher, et al. 2007. Air-water flux reconciliation between the atmospheric CO<sub>2</sub> profile and mass balance techniques. In: C. S. Garbe, R. A. Handler and B. Jahne, editors, *Transport at the Air-Sea Interface: Measurements, Models and Parametrizations*. Springer-Verlag Berlin, Berlin. p. 181-192.
- 23 Raymond, P.A., J.W. McClelland, R.M. Holmes, A.V. Zhulidov, K. Mull, B.J. Peterson, et al. 2007. Flux and age of dissolved organic carbon exported to the Arctic Ocean: A carbon isotopic study of the five largest arctic rivers. *Global Biogeochemical Cycles* 21. doi:Gb4011 10.1029/2007gb002934.
- 24 Raymond, P.A. and N.H. Oh. 2007. An empirical study of climatic controls on riverine C export from three major U.S. watersheds. *Global Biogeochemical Cycles* 21.

- 25 Striegl, R.G., M.M. Dornblaser, G.R. Aiken, K.P. Wickland and P.A. Raymond. 2007. Carbon export and cycling by the Yukon, Tanana, and Porcupine rivers, Alaska, 2001-2005. *Water Resources Research* 43.
- 26 Zappa, C.J., W.R. McGillis, P.A. Raymond, J.B. Edson, E.J. Hints, H.J. Zemmeling, et al. 2007. Environmental turbulent mixing controls on air-water gas exchange in marine and aquatic systems. *Geophysical Research Letters* 34.
- 27 Barnes, R.T., P.A. Raymond and K.L. Casciotti. 2008. Dual isotope analyses indicate efficient processing of atmospheric nitrate by forested watersheds in the northeastern US. *Biogeochemistry* 90: 15-27. doi:10.1007/s10533-008-9227-2.
- 28 Cooper, L.W., J.W. McClelland, R.M. Holmes, P.A. Raymond, J.J. Gibson, C.K. Guay, et al. 2008. Flow-weighted values of runoff tracers ( $\delta^{18}\text{O}$ , DOC, Ba, alkalinity) from the six largest Arctic rivers. *Geophysical Research Letters* 35. doi:L18606 10.1029/2008gl035007.
- 29 Holmes, R.M., J.W. McClelland, P.A. Raymond, B.B. Frazer, B.J. Peterson and M. Stieglitz. 2008. Lability of DOC transported by Alaskan rivers to the arctic ocean. *Geophysical Research Letters* 35. doi:L03402 10.1029/2007gl032837.
- 30 McClelland, J.W., R.M. Holmes, B.J. Peterson, R. Amon, T. Brabets, L.W. Cooper, et al. 2008. Development of a pan-Arctic database for river chemistry. *EOS Transactions* 89: 217-218.
- 31 Raymond, P.A., N.H. Oh, R.E. Turner and W. Broussard. 2008. Anthropogenically enhanced fluxes of water and carbon from the Mississippi River. *Nature* 451: 449-452. doi:10.1038/nature06505.
- 32 Barnes, R.T. and P.A. Raymond. 2009. The contribution of agricultural and urban activities to inorganic carbon fluxes within temperate watersheds. *Chem. Geol.* 266: 327-336.
- 33 Crump, B.C., B.J. Peterson, P.A. Raymond, R.M.W. Amon, A. Rinehart, J.W. McClelland, et al. 2009. Circumpolar synchrony in big river bacterioplankton. *Proceedings of the National Academy of Sciences of the United States of America* 106: 21208-21212. doi:10.1073/pnas.0906149106.
- 34 Griffith, D.R., R.T. Barnes and P.A. Raymond. 2009. Inputs of fossil carbon from wastewater treatment plants to U.S. Rivers and Oceans. *Env. Sci. Technol.* DOI:10.1021/es9004043.
- 35 Raymond, P.A. and N.H. Oh. 2009. Long term changes of chemical weathering in rivers heavily impacted from Acid Mine Drainage: Insights on the impact of coal mining on regional and global carbon and sulfur budgets. *Earth and Planetary Science Letters* 284: 50-56.
- 36 Barnes, R.T. and P.A. Raymond. 2010. Land-use controls on sources and processing of nitrate in small watersheds: insights from dual isotopic analysis. *Ecological Applications* 20: 1961-1978.
- 37 Caraco, N., J.E. Bauer, J.J. Cole, S. Petsch and P. Raymond. 2010. Millennial-aged organic carbon subsidies to a modern river food web. *Ecology* 91: 2385-2393.
- 38 Raymond, P.A. and J.E. Saiers. 2010. Event controlled DOC export from forested watersheds. *Biogeochemistry* 100: 197-209. doi:10.1007/s10533-010-9416-7.
- 39 Aufdenkampe, A.K., E. Mayorga, P.A. Raymond, J.M. Melack, S.C. Doney, S.R. Alin, et al. 2011. Riverine coupling of biogeochemical cycles between land, oceans and atmosphere. *Front. Ecol. Environ.* 9: 23-60.

- 40 Brantley, S.L., J.P. Megonigal, F.N. Scatena, Z. Balogh-Brunstad, R.T. Barnes, M.A. Bruns, et al. 2011. Twelve testable hypotheses on the geobiology of weathering. *Geobiology* 9: 140-165. doi:10.1111/j.1472-4669.2010.00264.x.
- 41 Butman, D. and P.A. Raymond. 2011. Significant efflux of carbon dioxide from streams and rivers in the United States. *Nature Geoscience* 4: 839-842. doi:10.1038/ngeo1294.
- 42 Griffith, D.R. and P.A. Raymond. 2011. Multiple-source heterotrophy fueled by aged organic carbon in an urbanized estuary. *Marine Chemistry* 124: 14-22.
- 43 Amon, R.M.W., A.J. Rinehart, S. Duan, P. Louchouart, A. Prokushkin, G. Guggenberger, et al. 2012. Dissolved organic matter sources in large Arctic rivers. *Geochimica Et Cosmochimica Acta* 94: 217-237. doi:10.1016/j.gca.2012.07.015.
- 44 Butman, D., P.A. Raymond, K. Butler and G. Aiken. 2012. Relationships between Delta C-14 and the molecular quality of dissolved organic carbon in rivers draining to the coast from the conterminous United States. *Global Biogeochemical Cycles* 26. doi:10.1029/2012gb004361.
- 45 Holmes, R.M., J.W. McClelland, B.J. Peterson, S.E. Tank, E. Bulygina, T.I. Eglinton, et al. 2012. Seasonal and Annual Fluxes of Nutrients and Organic Matter from Large Rivers to the Arctic Ocean and Surrounding Seas. *Estuaries and Coasts* 35: 369-382. doi:10.1007/s12237-011-9386-6.
- 46 Luysaert, S., G. Abril, R. Andres, D. Bastviken, V. Bellassen, P. Bergamaschi, et al. 2012. The European land and inland water CO<sub>2</sub>, CO, CH<sub>4</sub> and N<sub>2</sub>O balance between 2001 and 2005. *Biogeosciences* 9: 3357-3380. doi:10.5194/bg-9-3357-2012.
- 47 Raymond, P.A., M.B. David and J.E. Saiers. 2012. The impact of fertilization and hydrology on nitrate fluxes from Mississippi watersheds. *Current Opinion in Environmental Sustainability* 4: 212-218. doi:10.1016/j.cosust.2012.04.001.
- 48 Raymond, P.A., C.J. Zappa, D. Butman, T.L. Bott, J. Potter, P. Mulholland, et al. 2012. Scaling the gas transfer velocity and hydraulic geometry in streams and small rivers. *Limnology and Oceanography Fluids and Environments* 2: 41-53.
- 49 Stubbins, A., E. Hood, P.A. Raymond, G.R. Aiken, R.L. Sleighter, P.J. Hernes, et al. 2012. Anthropogenic aerosols as a source of ancient dissolved organic matter in glaciers. *Nature Geoscience* 5: 198-201. doi:10.1038/ngeo1403.
- 50 Tank, S.E., K.E. Frey, R.G. Striegl, P.A. Raymond, R.M. Holmes, J.W. McClelland, et al. 2012. Landscape-level controls on dissolved carbon flux from diverse catchments of the circumboreal. *Global Biogeochemical Cycles* 26. doi:10.1029/2012gb004299.
- 51 Tank, S.E., P.A. Raymond, R.G. Striegl, J.W. McClelland, R.M. Holmes, G.J. Fiske, et al. 2012. A land-to-ocean perspective on the magnitude, source and implication of DIC flux from major Arctic rivers to the Arctic Ocean. *Global Biogeochemical Cycles* 26. doi:10.1029/2011gb004192.
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- 53 Yoon, B. and P.A. Raymond. 2012. Dissolved organic matter export from a forested watershed during Hurricane Irene. *Geophysical Research Letters* 39. doi:10.1029/2012gl052785.
- 54 Bauer, J.E., W.J. Cai, P.A. Raymond, T.S. Bianchi, C.S. Hopkinson and P.A.G. Regnier. 2013. The changing carbon cycle of the coastal ocean. *Nature* 504: 61-70. doi:10.1038/nature12857.

- 55 Bianchi, T.S., F. Garcia-Tigreros, S.A. Yvon-Lewis, M. Shields, H.J. Mills, D. Butman, et al. 2013. Enhanced transfer of terrestrially derived carbon to the atmosphere in a flooding event. *Geophysical Research Letters* 40: 116-122. doi:10.1029/2012gl054145.
- 56 Collins, J.R., P.A. Raymond, W.F. Bohlen and M.M. Howard-Strobel. 2013. Estimates of New and Total Productivity in Central Long Island Sound from In Situ Measurements of Nitrate and Dissolved Oxygen. *Estuaries and Coasts* 36: 74-97. doi:10.1007/s12237-012-9560-5.
- 57 Grimm, N.B., F.S. Chapin, B. Bierwagen, P. Gonzalez, P.M. Groffman, Y.Q. Luo, et al. 2013. The impacts of climate change on ecosystem structure and function. *Frontiers in Ecology and the Environment* 11: 474-482. doi:10.1890/120282.
- 58 Lauerwald, R., J. Hartmann, N. Moosdorf, S. Kempe and P.A. Raymond. 2013. What controls the spatial patterns of the riverine carbonate system? - A case study for North America. *Chemical Geology* 337: 114-127. doi:10.1016/j.chemgeo.2012.11.011.
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- 60 Raymond, P.A., J. Hartmann, R. Lauerwald, S. Sobek, C. McDonald, M. Hoover, et al. 2013. Global carbon dioxide emissions from inland waters. *Nature* 503: 355-359. doi:10.1038/nature12760.
- 61 Regnier, P., P. Friedlingstein, P. Ciais, F.T. Mackenzi, N. Gruber, I.A. Janssens, et al. 2013. Anthropogenic perturbation of the carbon fluxes from land to ocean. *Nature Geoscience* 6: 597-607.
- 62 Wilson, H.F., J.E. Saiers, P.A. Raymond and W.V. Sobczak. 2013. Hydrologic drivers and seasonality of dissolved organic carbon concentration, nitrogen content, bioavailability, and export in a forested New England stream. *Ecosystems*.
- 63 Aiken, G.R., R.G.M. Spencer, R.G. Striegl, P.F. Schuster and P.A. Raymond. 2014. Influences of glacier melt and permafrost thaw on the age of dissolved organic carbon in the Yukon River basin. *Global Biogeochemical Cycles* 28: 525-537. doi:10.1002/2013gb004764.
- 64 Carlson, K.M., L.M. Curran, A.G. Ponette-Gonzalez, D. Ratnasari, Ruspita, N. Lisnawati, et al. 2014. Influence of watershed-climate interactions on stream temperature, sediment yield, and metabolism along a land use intensity gradient in Indonesian Borneo. *Journal of Geophysical Research-Biogeosciences* 119: 1110-1128. doi:10.1002/2013jg002516.
- 65 Ciais, P., A.J. Dolman, A. Bombelli, R. Duren, A. Peregon, P.J. Rayner, et al. 2014. Current systematic carbon-cycle observations and the need for implementing a policy-relevant carbon observing system. *Biogeosciences* 11: 3547-3602. doi:10.5194/bg-11-3547-2014.
- 66 Fellman, J.B., E. Hood, R.G.M. Spencer, A. Stubbins and P.A. Raymond. 2014. Watershed Glacier Coverage Influences Dissolved Organic Matter Biogeochemistry in Coastal Watersheds of Southeast Alaska. *Ecosystems* 17: 1014-1025. doi:10.1007/s10021-014-9777-1.
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- permafrost thaw in boreal watersheds of interior Alaska. *Journal of Geophysical Research-Biogeosciences* 119: 2155-2170. doi:10.1002/2014jg002695.
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98. Talbot, C. J., E. M. Bennett, K. Cassell, D. M. Hanes, E. C. Minor, H. Paerl, P. A. Raymond, R. Vargas, P. G. Vidon, W. Wollheim and M. A. Xenopoulos (2018). "The impact of flooding on aquatic ecosystem services." Biogeochemistry.
99. Liu, S., Raymond, P.A., 2018. Hydrologic controls on pCO<sub>2</sub> and CO<sub>2</sub> efflux in US streams and rivers. *Limnology and Oceanography Letters*, 3(6): 428-435.
100. Drake, T.W., Raymond, P.A., Spencer, R.G.M., 2018. Terrestrial carbon inputs to inland waters: A current synthesis of estimates and uncertainty. *Limnology and Oceanography Letters*, 3(3): 132-142.

### **Non-Refereed Publications**

Raymond, P.A., 2005. The Age of the Amazon's Breath. *Nature*, 436 469-470.

### **Extramural Grants**

- 2018- National Science Foundation- Cross Cutting Activities. Watershed Rules of Life. \$900,000. Lead PI, sub contract to Colin Gleason (UMass) and Byron Crump (Oregon State)
- 2017- NASA- Carbon Cycle Science. Magnitude and controls on the lateral transport of carbon via streams and rivers. \$961,500. Lead PI, sub-contract to David Butman (University Washington).
- 2015- National Science Foundation- DEB. Collaborative Research: Linking microbial diversity, gene expression, and the transformation of terrestrial organic matter in major U.S.rivers. \$1,532,000. Co-PI, with Byron Crump (lead, University of Oregon), Aron Stubbins (Skiddaway), and George Aiken (USGS)
- 2014- National Science Foundation- Biological Sciences, MacroSystems Biology. Collaborative Research: RUI: The Pulse-Shunt Concept: A conceptual framework for quantifying and forecasting watershed DOM fluxes and transformations at the MacroSystem scale. \$2,400,000. Lead PI, with James Saiers (Yale FES), Bill Sobczak (Holy Cross), Aron Stubbins (Skiddaway), and Jon Morrison, Jamie Shanley, Brian Pellerin (USGS)
- 2013-2106 National Science Foundation- DEB. The Pulse-Shunt Hypothesis: Predicting the Evolution of DOM Composition and DOM Subsidies in Drainage Networks. \$600,000. Lead PI, with James Saiers (Yale-FES)
- 2012-2015 National Science Foundation- DEB. Collaborative research: Is the export of ancient, labile carbon from glacial ecosystems driven by the deposition of fossil

- fuel combustion byproducts? \$706,000. With Aron Stubbins (Lead PI) and Marc Friscer (lead-Skiddaway), Robert Spencer (WHRC), and Eran Hood and Jason Fellman (Univ.Alaska Southeast).
- 2012- National Science Foundation- Arctic Science Division. The Arctic Great Rivers Observatory. \$2,633,299. With Robert Holmes (lead PI- WHRC), Bruce Peterson (MBL), James McClelland (U-Texas Austin)
- 2011-2015 National Aeronautics and Space Administration- Carbon Cycle Science Program. United States Stream and River CO<sub>2</sub> Evasion. \$507,000. Lead PI, with Karen Seto (Yale FES) and Yongtao Guan (Yale School of Public Health)
- 2008-2011. National Science Foundation-Polar Observing Systems. Collaborative Research: IPY: Arctic Great Rivers Observatory (Arctic-GRO). \$1,544,000. With Bruce Peterson (MBL, Lead PI), Max Holmes (WHRC) and Jim McClelland (U-Texas, Austin)
- 2006 – 2011 National Science Foundation-Ecosystems. CAREER: The Lateral Transport of Watershed Atmospheric Carbon by Rivers. \$580,000. Lead PI.
- 2005 – 2009 National Science Foundation-Physical Oceanography. Collaborative Research: Determining the Air-Water CO<sub>2</sub> Flux in Coastal Systems. \$671,000. With C. Zappa (Lamont, lead PI) and Wade McGillis (Lamont)
- 2004 – 2007 National Science Foundation-Ecosystems. Collaborative Research: Aquatic Plant Beds as Biogeochemical Hot Spots in a Large River Ecosystem. \$60,000 subcontract. With N Caraco (lead PI- IES), S Findlay (IES), S Macintyre (UC-Santa Barbara), W McGillis (Lamont)
- 2004 – 2007 National Science Foundation-Integrated Carbon Research EAR. Collaborative Research: Assessing the Variability and Modification of Age, Character and Reactivity of Organic Carbon Delivered by Rivers and Estuaries to an Ocean Margin. \$847,000. With J Bauer (lead PI-William & Mary), J Cole (IES), N Caraco (IES), S Petsch (Umass-Amherst).
- 2004 – 2006 NOAA. O<sub>2</sub> and O<sub>2</sub> air-water exchange in Florida Bay: Hydrodynamic controls on the gas transfer velocity and linkages to net ecosystem metabolism. \$37,000 subcontract. With W McGillis (Lamont, lead PI), J E Boyer (FIU).
- 2004 – 2007 National Science Foundation-Ecosystems. Collaborative Research: Delivery and Fate of Old Terrestrial Organic Matter in a Riverine Ecosystem. \$847,000. With J Cole (lead PI, IES), J Bauer (William & Mary), N Caraco (IES).
- 2002 – 2003 Hudson River Foundation. Measurements and Modeling of the Gas Transfer Velocity in the Hudson River Estuary, \$92,000. with Wade McGillis (Lamont)

## **Invited Seminars and Symposia**

- 2018 AGU Fall meeting, Stream and River Methane Fluxes
- 2018 AGU Fall Meeting, Greenhouse gas evasion from streams and rivers
- 2018 Department of Energy Watershed SFA workshop, Watersheds as integrators of terrestrial processes
- 2017 The College of the Holy Cross. The role of inland waters in the global carbon budget
- 2016 DOE Terrestrial Aquatic Interfaces (TAI) workshop, Carbon cycling in the TAI
- 2016 Ocean Carbon and Biogeochemistry workshop, Woods Hole, Inland water dissolved fluxes
- 2016 Woods Hole Oceanographic Institute, Pulsed transport of DOM to coastal waters.
- 2016 Linkoping University, Drainage basins as reactors
- 2016 Uppsala University, Scaling stream and river CO<sub>2</sub> evasion
- 2016 EGU, Arctic River organic matter transport
- 2016 Helsinki University, Drainage basins as biogeochemical reactors
- 2016 Uppsala University, The Pulse Shunt Concept
- 2016 University of Stockholm, The Pulse Shunt Concept.
- 2015 Chemical Oceanography Gordon Conference. Hydrologic events strengthen land-ocean connection
- 2015 Bigelow Laboratory for Ocean Sciences. Drainage basins as reactors
- 2015 ASLO Ocean Science 2015 Plenary Speaker. Drainage basins as reactors
- 2014 University of Florida. The Pulse-Shunt-Concept: A new conceptual framework for understanding the biogeochemistry of drainage basins.
- 2014 Boston University. The Pulse-Shunt-Concept: A new conceptual framework for understanding the biogeochemistry of drainage basins.
- 2014 Northeastern University. The carbon chemistry of rivers.

- 2014 Duke University. Inland waters and global carbon.
- 2013 The University of Alabama. The Pulse-Shunt-Concept: A new conceptual framework for understanding the biogeochemistry of drainage basins.
- 2013 Global CO<sub>2</sub> emissions from inland waters. 9<sup>th</sup> International Carbon Dioxide Conference. Beijing, China
- 2013 Global CO<sub>2</sub> Emissions from Inland Waters. CNRS, France.
- 2012 AGU Fall Meeting, Warming Waters: Role of Freshwaters in Regional and Global Carbon and nutrient cycling session. San Francisco CA
- 2012 Frontier Talk, SOM-5 International Workshop. The Pulse-Shunt-Concept: A new conceptual framework for understanding DOM fluxes and reactions in drainage basins. Ascona, Switzerland
- 2012 Ocean Carbon and Biogeochemistry Workshop. Land-ocean transport and linkages with global change session. Woods Hole, MA.
- 2012 Keynote speaker. Goldschmidt Conference, Montreal. The dynamics of continental weathering session
- 2012 LSCE, France. Dissolved organic Carbon Export from Streams.
- 2012 IGBP, France. Anthropogenic Impacts on Dissolved Inorganic Carbon River Fluxes.
- 2012 MBL Ecosystems Center Seminar Series
- 2011 Woods Hole Oceanographic Geodynamics Seminar Series.
- 2011 Lehigh University Foster Hewitt Lecture Series.
- 2011 University of Rhode Island Ecology Seminar Series
- 2010 AGU Fall Meeting, Managing Water Resources Risks session. San Francisco, CA
- 2010 Wesleyan Earth and Environmental Sciences Seminar
- 2010 AGU Summer meeting, session Inland and Littoral Waters as a Land-Ocean-Atmosphere Interface in the Global Carbon Cycle.
- 2009 AGU Fall meeting, session Manmade Global Change and Material Cycles. San Francisco, CA.

2009 Oregon State University Frontiers Visiting Scholar Series, Corvallis OR

2009 Oregon State College of Ocean and Atmospheric Sciences, Corvallis OR

2009 Ecosystems Center, Woods Hole MA.

2008 Purdue, Department Earth and Atmospheric Sciences, West Lafayette IN

2008 University of Montana, Center for Ethics, Missoula MT

2008 University of Connecticut, Avery Point Campus, Groton CT.

2007 Catchment Science Gordon Conference. New London N.H.

2007 MIT, Department of Earth and Planetary Sciences. Boston MA.

2007 Columbia, Lamont Doherty Earth Observatory, Palisades N.Y.

2006 Univ. South Carolina, Marine Sciences Program, Columbia S.C.

2006 Rutgers, Institute of Marine and Coastal Sciences, New Brunswick N.J.

2006 Organic Geochemistry Gordon Conference, Plymouth N.H.

2006 Goldschmidt Conference (Keynote), Melbourne Australia

2006 Geochemical Earth Reference Model Workshop (Plenary), Columbia NYC

2006 Institute of Ecosystem Studies, Millbrook N.Y

2005 Carnegie Institution of Plant Biology, Stanford CA

2005 Univ. Minnesota, Dept. EE&B (Lindeman speaker), St. Paul MN

2004 University of Connecticut Avery Point Marine Campus, Groton CT.

2004 University of Massachusetts/Amherst, Geology Department, Amherst MA

2003 Symposium on new approaches in marine organic biogeochemistry, Friday Harbor Laboratory, Seattle WA

2002 AGU (invited talk), San Francisco CA

2002 Yale School of Forestry and Environmental Studies, New Haven CT

- 2002            Stroud Water Research Center, Avondale PA.
- 2001            DIALOG IV, Bermuda
- 2000            WHOI, Applied Ocean Physics and Engineering department, Woods Hole MA
- 2000            Lawrence Livermore National Laboratory, Livermore CA
- 1999            Estuarine Research Federation annual meeting (invited talk), New Orleans LA

**External Service and Effort**

- 2018-present    Member US Carbon Cycle Aquatic Continuum Science Focus Group
- 2017-present    Editor in Chief of Global Biogeochemical Cycles
- 2016-present    Science Board of Roger Tory Peterson Estuary Center
- 2016-present    President Branford Land Trust
- 2016            Participant and member of the writing Team for DOE “Research Priorities to Incorporate Terrestrial-Aquatic Interfaces in Earth System Models
- 2014-2016      Board of Directors Branford Land Trust
- 2013-2015      Study Manager and lead author for Connecticut Academy of Sciences and Engineering study “Methods to measure phosphorus limits and make future projections” (Working Group 2 from CT Public Act 12-155).  
<http://www.ctcase.org/reports/phosphorus/phosphorus.pdf>
- 2013-2015      Member NEON Science Symposia and Workshop committee
- 2010-2015      Associate Editor, Journal of Geophysical Research- Biogeosciences
- 2012-2013      Steering Committee for 9<sup>th</sup> International Carbon Dioxide Conference- Beijing
- 2011-2013      Lead Author of Technical input report “Impacts of climate change on biodiversity, ecosystems and ecosystem services” to 2013 U.S. National Climate Assessment
- 2011-2014      Contributing author to IPCC AR5 Assessment Report: The Physical Science Basis
- 2011-2013      Contributor to RECCAP component of Global Carbon Project

- 2011-2012 Member of the National Climate Assessments Ecosystems, Biodiversity, and Ecosystem Services: Assessing Climate Change Impacts and Evaluating Responses Working Group
- 2007-2012 Member of the United States Carbon Cycle Scientific Steering Group (CCSSG)
- 2010-2012 Assistant Chair United States Carbon Cycle Scientific Steering Group
- 2009 Invited participant in the second workshop of the “Site and Regional Continental Interim Synthesis of the North American Carbon Program”. Oak Ridge TN, November 2009
- 2009 Invited participant in NSF sponsored workshop on “Frontiers in Exploration of the Critical Zone II: The Geobiology of Weathering and Erosion”. Washington DC, October 2009.
- 2009 Invited participant in the Coupled Biogeochemical Event at the Ecological Society of America’s annual meeting, August 2009
- 2008-2010 Contributed to the Coastal Interim Synthesis activities of the North American Carbon program
- 2008 Invited participated and presented at Terrestrial and Coastal Carbon Fluxes in the Gulf of Mexico scoping workshop in St. Petersburg Florida
- 2007 External reviewer of the EPA’s “Estuarine Nutrient Criteria Development: State of the Science” document
- 2005 Participant ORION regional planning meeting, Avery Point CT
- 2005 Invited participant in North American Continental Margins (NACM) workshop, Boulder
- 2005 International Scientific Steering Committee for the 37<sup>th</sup> International Colloquium on Ocean Dynamics session on Gas Transfer at Water Surfaces, Leige
- 2005 Invited participant Hudson River Foundation “State of Knowledge” workshop
- 2004 Invited participant River Dominated Ocean Margins (RioMAR) workshop, New Orleans
- 2003 Presenter Northeast Association of Forest Managers annual meeting
- 2003 Co-Chaired special session INQUA conference, Reno
- 2003 Co-Chaired special session ERF meeting, Seattle

## **University Service**

- 2018-present Member University Core Facilities Task Force
- 2018-present Member FES Title IX Committee
- 2017-present Lead of Yale FES Climate Initiative
- 2010-present Director Yale Analytical and Stable Isotope Center
- 2014-present Member Yale Committee of Natural Lands
- 2008-present Member of the Yale Institute for Biospherical Studies faculty council
- 2014-2015 Standing Advisory and Appointments Committee for the School of Forestry & Environmental Studies
- 2011-2012 Member of the Yale Climate and Energy Institutes Policy and Strategy Board
- 2011-2012 Member University Wide Committee on Sexual Misconduct
- 2008-2012 Member of the Yale Climate and Energy Institute's executive committee
- 2007-2013 Participant in the Peabody Museum EVOLUTION's program
- 2002-2010 Member of Center Earth System Science Center for Stable Isotopes Studies faculty advisory board

## **Doctoral-Student Advising**

### Chair/Co-Chair

Rebecca Barnes (FES- 2009; received a NSF-Geosciences post doctoral fellowship), David Butman (FES, 2012), Maura Bozeman (FES, 2012), Yong Zhao (FES, in progress), Bryan Yoon (in progress), Lisa Walsh (in progress), Kelly Aho (in progress)

### Committee Member

Huiyan Hu (FES- 2006), Annika Walters (EEB-2009), Holly Jones (FES, 2010), Xin Zhang (FES, in progress), Brandon Barton (FES, 2010), Sarah Schillawski (William and Mary, in progress), Paul Wang (FES, 2010), Troy Hill (FES, 2015), Dwi Astiani (FES, 2014), Ashley Kaiser (2014), Meredith Holgerson (2016), Emily Oldfield (in progress)

## **Masters-Student Advising**

### FES MeSC



Alexandra Williamson (2004), Huiyan Zhao (2005), Rishi Das (2005), David Butman (2006), David Griffith (2007), Yong Zhao (2007), James Collins (2011), Hui Wen Cheng (2010), Martin Bouda (2010), Bryan Yoon (2012), Kelly Aho (2015), Emily Ury (2016), Matt Schultz (2016), Elizabeth Creech (in progress), Rachel Lowenthal (in progress), Yishen Li (in progress)

#### Committee Member

Brett Longworth (2005-Umass Amherst)

#### **Post Doctoral Associates**

Neung Hwan Oh (2003-2005), Henry Wilson (2009-2011, co-advisor), LiQing Jiang (2010-2011), David Butman (2011-), Jay Zarnetsky (2012-2013), Jake Hosen 2015-present, Wenjun Song (2016-present), Longzhu Shen (2017-present)

#### **Post Graduates Associates**

Mark Hoover (2011-2013)

#### **Dissertation Opponent**

Ville Kasurinen, Helsinki University, April 2016  
Sivakiruthika Natchimuthu, Linkoping University, May 2016

#### **Dissertation Licentiate Examiner**

Audrey Campeau, Uppsala University, February 2016  
Liselott Kutch, Stockholm University, June 2016

#### **External Dissertation Reviewer**

Liu Shaoda, National University of Singapore

#### **Undergraduate Senior Thesis/Project**

Emily Far (G&G 2014)

#### **Professional Affiliations (last 5 years)**

American Geophysical Union  
American Society of Limnology and Oceanography  
Estuarine Research Federation  
American Association for the Advancement of Science

#### **Peer Review Service**

##### Journals (39)

Limnology & Oceanography, Marine Chemistry, Archiv fuer Hydrobiologie, Estuaries, Proceedings of the National Academy, Estuary and Coastal Shelf Science, Hydrobiologia Deep Sea Research II, Aquatic Microbial Ecology, Nature, Journal of Geophysical Research- Oceans, Global Biogeochemical Cycles, Geophysical Research Letters, Biogeosciences, Ecol Monogr., Science, Chemical Geology, Geochimica et Cosmochimica Acta, Limnology and Oceanography Methods, Journal of Geophysical

Research-Earth Surfaces, European Journal of Soil Science, Ecology , Ecosystems, Marine Geology, Applied Geochemistry, Nature-Geoscience, Oceanography, Global Change Biology, Earth and Planetary Science Letters, Journal of Geophysical Sciences-Biogeosciences, Nature Science Reports, Limnology and Oceanography: Fluids and Environments, Inland Waters, Proceedings of the National Academy of Sciences, Environmental Fluid Mechanics, Environmental Science and Technology, Northeast Naturalist, Geology.

### Books

Chapters: Biogeochemistry of Estuaries

### Proposals

National Science Foundation (Ecosystems, Chemical Oceanography, Physical Oceanography, Integrated Carbon Cycle Research, Hydrology, Low Temperature Geochemistry, Margins, Geomorphology and Land-Use Dynamics Program), CALFED, American Chemical Society, Fonds de recherche- Quebec, SeaGrant, Swedish Research Council, European Commission

Panel Service. NSF IGERT pre-proposal (2002), NSF Ecosystems (2005, 2007 and 2008). NSF Ecosystems pre-proposal (2014).