

Nicholas (Nick) D. Ward, PhD

Pacific Northwest National Laboratory
1529 W Sequim Bay Road, Sequim, WA 98382
Phone: (360) 681-3604 | Email: nicholas.ward@pnnl.gov
Website: www.wardecosystemsresearch.org

Human societies and earth systems are in constant co-evolution, while anthropogenic impacts on the environment can be both intensified and dampened by natural feedback loops. I aim to establish a baseline understanding of how ecosystems function naturally and predict the influence of disturbances and human activities on hydrological, biogeochemical, and ecological processes.

Education

2014 PhD Chemical Oceanography, School of Oceanography, University of Washington, Seattle, WA
2010 MS Chemical Oceanography, School of Oceanography, University of Washington, Seattle, WA
2008 BS Environmental Systems, Biology minor, University of California San Diego, La Jolla, CA

Professional Experience

2021-present **Team Lead**, Environmental Biogeochemistry Team, Coastal Sciences Division, Pacific Northwest National Laboratory, Sequim, WA
2022-present **Earth Scientist (Level 4)**, Coastal Sciences Division, Pacific Northwest National Laboratory, Sequim, WA
2018-present **Faculty Fellow**, School of Oceanography, University of Washington, Seattle, WA
2019-2022 **Earth Scientist (Level 3)**, Coastal Sciences Division, Pacific Northwest National Laboratory, Sequim, WA
2016-2019 **Earth Scientist (Level 2)**, Coastal Sciences Division, Pacific Northwest National Laboratory, Sequim, WA
2017-2018 **Affiliate Assistant Professor**, School of Oceanography, University of Washington, Seattle, WA
2016 **Research Scientist**, Whitney Laboratory for Marine Bioscience, University of Florida, St. Augustine, FL
2014-2016 **Post-Doctoral Associate**, Geological Sciences, University of Florida, Gainesville, FL
2007 **Research Assistant**, Woods Hole Oceanographic Institution, Woods Hole, MA
2006-2008 **Research Assistant**, Scripps Institution of Oceanography, La Jolla, CA
2003 **Research Assistant**, Naval Post Graduate School, Monterey, CA

Peer-Reviewed Publications (2,237 citations, h-index = 23, i10-index = 37)

71. Coppola, A., Wagner, A., Lenartz, S., Seidel, M., Ward, N.D., Dittmar, T., Santin, C., Jones, M. (2022) The black carbon cycle and its role in the Earth system. *Nature Reviews: Earth & Environment*. 3, 516-532. <https://doi.org/10.1038/s43017-022-00316-6>
70. Fremin, B.J., *Global Phage Small Open Reading Frame Consortium (Includes *Ward, N.D.), Bhatt, A., Kyrpides, N.C. (2022) Thousands of small, novel genes predicted in global phage genomes. *Cell Reports*. 39, 110984. <https://doi.org/10.1016/j.celrep.2022.110984>
69. Lee, M., Ward, N.D., Kent, R. (in press) A novel resonant electro-physical transmutation method for water purification. Submitted to *Nature Portfolio Journal: Clean Water*. 5 (35). <https://doi.org/10.1038/s41545-022-00179-w>
68. Li, W., McDowell, N., Wang, W., Mackay, D., Leff, R., Zhang, P., Ward, N.D., Norwood, M., Yabusaki, S., Myers-Pigg, A., Pennington, S., Pivovarov, A., Waichler, S., Xu, C., Bond-Lamberty, B., Bailey, V. (2022) The influence of increasing atmospheric CO₂, temperature, and

- vapor pressure deficit on seawater-induced tree mortality. *New Phytologist*.
<https://doi.org/10.1111/nph.18275>
67. McDowell, N.G., Ball, M., Bond-Laberty, B., Kirwan, M.L., Krauss, K., Megonigal, J.P., Mencuccini, M., Ward, N.D., Weintraub, M., Bailey, V. (2022) Processes and mechanisms of coastal woody-plant mortality. Submitted to *Global Change Biology*. 00, 1–20.
<https://doi.org/10.1111/gcb.16297>
66. Richey, J.E., Spencer, R., Drake, T.W., Ward, N.D. (2022) Fluvial carbon dynamics across the land to ocean continuum of great tropical rivers: the Amazon and Congo. *AGU Monograph Series*. In *Congo Basin Hydrology, Climate, and Biogeochemistry: A Foundation for the Future*. Edited by Alsdorf, D.E., Tshimanga, R., Moukandi, G.
<https://doi.org/10.1002/9781119657002.ch20>
65. Richey, J.E., Spencer, R., Drake, T.W., Ward, N.D. (2022) Dynamique du carbone fluvial dans le continuum terre-océan des grands fleuves tropicaux : l'Amazonie et le Congo. In *Hydrologie, Climat et Biogéochimie du Bassin du Congo: Une Base pour l'Avenir*. Edited by Alsdorf, D.E., Tshimanga, R., Moukandi, G. <https://doi.org/10.1002/9781119842125.ch20>
64. Wang, W., Zhang, P., Zhang, H., Grossiord, C., Pennington, S., Norwood, M., Li, W., Pivovarov, A.L., Fernández-de-Uña, L., Leff, R., Yabusaki, S., Waichler, S., Bond-Lamberty, B., Bailey, V., Ward, N.D., McDowell, N. (2022) Severe declines in hydraulic capacity and associated carbon starvation drive mortality in seawater exposed Sitka-spruce (*Picea sitchensis*) trees. *Environmental Research Communications*. 4, 035005. <https://doi.org/10.1088/2515-7620/ac5f7d>
63. Ward, N.D., Bianchi, T.S., Osburn, C.L., Myers-Pigg, A. (accepted) Biogeochemical changes in estuaries. In *Climate Change and Estuaries*. Edited by Kennish, M.J., Paerl, H.W., Croswell, J.R.
62. Indivero, J., Myers-Pigg, A., Ward, N.D. (2021) Seasonal changes in the drivers of water physico-chemistry variability of a small freshwater tidal river. *Frontiers in Marine Science*. 8, 607664.
<https://doi.org/10.3389/fmars.2021.607644>
61. Johnson, P., Merle, S.G., Bjorklund, T., Hautala, S.L., Baumberger, T., Liu, J., Ward, N.D., Wang, C. (2021) Methane Plume Emissions from Puget Sound faults within the Cascadia forearc. *Geochemistry, Geophysics, Geosystems*. 23, e2021GC010211.
<https://doi.org/10.1029/2021GC010211>
60. Less, D.F.S., Ward, N.D., Richey, J.E., Cunha, A.C.C. (2021) Influence of seasonal and daily variation of discharge and tide on flow velocity in the Amazon River mouth. *Journal of Coastal Research*. 37(6), 1181–1192. <https://doi.org/10.2112/JCOASTRES-D-21-00010.1>
59. Li, W., Zhang, H., Wang, W., Zhang, P., Ward, N.D., Norwood, M., Myers-Pigg, A., Zhao, C., Leff, R.T., Yabusaki, S., Waichler, S., Bailey, V.L., McDowell, N.G. (2021) Changes in carbon and nitrogen metabolism during seawater-induced mortality of *Picea sitchensis* trees. *Tree Physiology*. 41(12), 2326–2340. <https://doi.org/10.1093/treephys/tpab073>
58. Norwood, M.J., Ward, N.D., McDowell, N.G., Myers-Pigg, A.N., Bond-Lamberty, B., Pennington, S., Wang, W., Kirwan, M., Hopple, A.M., Megonigal, J.P. (2021) Coastal forest seawater exposure increases stem methane concentration. *Journal of Geophysical Research: Biogeosciences*. 126, e2020JG005915. <https://doi.org/10.1029/2020JG005915>
57. Regier, P., Ward, N.D., Indivero, J., Wiese Moore, C., Norwood, M., Myers-Pigg, A. (2021) Biogeochemical control points of connectivity between a tidal creek and its floodplain. *Limnology & Oceanography: Letters*. 6 (3), 134–142. <https://doi.org/10.1002/lol2.10183>
56. Sawakuchi, H.O., Bastviken, D., Enrich-Prast, A., Ward, N.D., Richey, J.E., (2021) Low diffusive methane emissions from the main channel of a large Amazonian run-of-the-river reservoir attributed to high methane oxidation. *Frontiers in Environmental Science*. 9, 655455.
<https://doi.org/10.3389/fenvs.2021.655455>

55. Sengupta, A., Stegen, J., Bond-Lamberty, B., Rivas-Ubach, A., Zheng, J., Handakumbura, P., Norris, C., Peterson, M.J., Yabusaki, S., Bailey, V., Ward, N.D. (2021) Antecedent conditions determine the biogeochemical response of coastal soils to seawater exposure. *Soil Biology & Biochemistry*. 108104. <https://doi.org/10.1016/j.soilbio.2020.108104>
54. Tagestad, J., Ward, N.D., Butman, D., Stegen, J.C. (2021) Small streams dominate US tidal reaches and will be disproportionately impacted by sea-level rise. *Science of the Total Environment*. 753, 141944. <https://doi.org/10.1016/j.scitotenv.2020.141944>
53. Valerio, A., Kampel, M., Vantrepotte, V., Ward, N.D., Richey, J.E. (2021) Optical classification of Lower Amazon waters based on in situ data and Sentinel-3 Ocean and Land Colour Instrument imagery. *Remote Sensing*. 13, 3057. <https://doi.org/10.3390/rs13163057>
52. Valerio, A.M., Kampel, M., Ward, N.D., Sawakuchi, H.O., Cunha, A.C., Krusche, A.V., Richey, J.E. (2021) CO₂ partial pressure and fluxes in the Amazon River Plume using in situ and remote sensing data. *Continental Shelf Research*. 215, 104348. <https://doi.org/10.1016/j.csr.2021.104348>
51. Zhang, P., McDowell, N.G., Zhou, X., Wang, W., Leff, R.T., Pivovarov, A.L., Zhang, H., Chow, P.S., Ward, N.D., Indivero, J., Yabusaki, S., Waichler, S., Bailey, V.L. (2021) Declining carbohydrate content of Sitka-spruce trees dying from seawater exposure. *Plant Physiology*. Kiab002. <https://doi.org/10.1093/plphys/kiab002>
50. Zhang, H., Li, X., N.G., Wang, W., Pivovarov, A.L., Li, W., Zhang, P., Ward, N.D., Myers-Pigg, A.N., Adams, H.D., Leff, R.T., Wang, A., Yuan, F., Wu, J., Yabusaki, S., Waichler, S., Bailey, V., Guan, D., Wang, A., McDowell, N. (2021) Seawater exposure causes hydraulic damage in dying Sitka-spruce trees. *Plant Physiology*. <https://doi.org/10.1093/plphys/kiab295>
49. Schafer, T., Ward, N.D., Julian, P., Reddy, K.R., Osborne, T.Z. (2020) Impacts of hurricane disturbance on water quality across the aquatic continuum of a black-water river to estuary complex. *Journal of Marine Science and Engineering*. 8 (12). <https://doi.org/10.3390/jmse8060412>
48. Silva, G.C.X., Abreu, H.M., Ward, N.D., Cunha, H.F.A., Brito, D.C., Cunha, A.C. (2020) Environmental impacts of dam reservoir filling in the East Amazon. *Frontiers in Water*. 2 (11). <https://doi.org/10.3389/frwa.2020.00011>
47. Wang, W., McDowell, N., Pennington, S., Grossiord, C., Leff, R., Ward, N.D., Megonigal, J.P., Bond-Lamberty, B., Bailey, V. (2020). Tree growth, transpiration, and water-use efficiency between shoreline and upland red maple (*Acer rubrum*) trees in a coastal forest. *Agricultural and Forest Meteorology*. 295, 108163. <https://doi.org/10.1016/j.agrformet.2020.108163>
46. Ward, N.D., Bianchi, T.S., Martin, J.B., Quintero, C.J., Sawakuchi, H.O., Cohen, M. (2020) Pathways for methane emissions and oxidation that influence the net carbon balance of a subtropical cypress swamp. *Frontiers in Earth Science*. 8, 573357. <https://doi.org/10.3389/feart.2020.573357>
45. Ward, N.D., Megonigal, J.P., Bond-Lamberty, B., Bailey, V., Butman, D., Canuel, E.A., Diefenderfer, H., Ganju, N.K., Goñi, M.A., Graham, E.B., Hopkinson, C.S., Khangaonkar, T., Langley, J.A., McDowell, N.G., Myers-Pigg, A.N., Neumann, R.B., Osburn, C.L., Price, R.M., Rowland, J., Sengupta, A., Simard, M., Thornton, P.E., Tzortziou, M., Vargas, R., Weisenhorn, P.B., Windham-Myers, L. (2020) Representing the function and sensitivity of coastal interfaces in Earth System Models. *Nature Communications*. 11 (2458). <https://doi.org/10.1038/s41467-020-16236-2>
44. Yabusaki, S., Myers-Pigg, A., Ward, N.D., Waichler, S.R., Sengupta, A., Hou, Z., Chen, X., Fang, Y., Duan, Z., Serkowski, J., Indivero, J., Wiese Moore, C., Gunn, C. (2020) Floodplain inundation

- and salinization from a recently restored first-order tidal stream. *Water Resources Research*. 56, e2019WR026850. <http://dx.doi.org/10.1029/2019WR026850>
43. Zayas-Santiago, C., Rivas-Ubach, A., Kuo, L.J., Ward, N.D., Zimmerman, R.C. (2020) Metabolic profiling reveals biochemical pathways responsible for eelgrass response to elevated CO₂ and temperature. *Scientific Reports*. 10 (4693). <https://doi.org/10.1038/s41598-020-61684-x>
 42. Araújo, K.R., Sawakuchi, H.O., Bertassoli Jr., D.J., Sawakuchi, A.O., da Silva, K.D., Bernardi, T.V., Ward, N.D., Pereira, T.S. (2019) Carbon dioxide (CO₂) concentrations and emission in the newly constructed Belo Monte hydropower complex in the Xingu River, Amazonia. *Biogeosciences*. 16 (18), 3527-3542. <https://doi.org/10.5194/bg-16-3527-2019>
 41. Arellano, A.R., Bianchi, T.S., Osburn, C.L., D'Sa, E.J., Oviedo-Vargas, D., Ward, N.D., Joshi, I., Ko, D., Shields, M.R., Kurian, G., Green, J. (2019) Mechanisms of blue carbon export in estuaries with contrasting carbon sources. *Journal of Geophysical Research: Biogeosciences*. 124 (10), 3168-3188. <https://doi.org/10.1029/2018JG004868>
 40. Bianchi, T.S. and Ward, N.D. (2019) Editorial: The Role of Priming in Terrestrial and Aquatic Ecosystems. *Frontiers in Earth Science*. 7 (321). <https://doi.org/10.3389/feart.2019.00321>
 39. Bond-Lamberty, B., Pennington, S., Jian, J., Megonigal, P., Sengupta, A., Ward, N.D. (2019) Soil respiration variability and correlation across a wide range of temporal scales. *Journal of Geophysical Research: Biogeosciences*. 124, 3672-3685. <https://doi.org/10.1029/2019JG005265>
 38. Chamberlain, C., Bianchi, T.S., Brown, A.L., Cohen, M.J., Dong, X., Flint, M.K., Martin, J.B., McLaughlin, D.L., Murray, A.B., Pain, A., Quintero, C., Ward, N.D., Zhang, X., Heffernan, J.B. (2019) Mass balance implies Holocene development of a low-relief karst patterned landscape. *Chemical Geology*. 527 (20), 118782. <https://doi.org/10.1016/j.chemgeo.2018.05.029>
 37. Coppola, A.I., Seidel, M., Ward, N.D., Viviroli, D., Haghypour, N., Nascimento, G.S., Jones, M., Revells, B.N., Abiven, S., Jones, M., Richey, J.E., Eglinton, T.I., Dittmar, T., Schmidt, M.W.I. (2019) Marked isotopic variability within and between the Amazon River and marine dissolved black carbon pools. *Nature Communications*. 10 (4018). <https://doi.org/10.1038/s41467-019-11543-9>
 36. Dong, X., Cohen, M.J., Martin, J.B., McLaughlin, D.L., Murray, A.B., Ward, N.D., Flint, M.K., Heffernan, J.B. (2019) Ecohydrologic processes and soil thickness feedbacks control limestone-weathering rates in a karst landscape. *Chemical Geology*. 527 (20), 118774. <https://doi.org/10.1016/j.chemgeo.2018.05.021>
 35. Kuhn, C., Valerio, A., Ward, N.D., Loken, L., Sawakuchi, H.O., Kampel, M., Richey, J.E., Stadler, P., Crawford, J., Striegl, R.G., Vermote, E., Pahlevan, N., Butman, D. (2019) Performance of Landsat-8 and Sentinel-2 surface reflectance products for river remote sensing retrievals of chlorophyll-a and turbidity. *Remote Sensing of Environment*. 224, 104-118. <https://doi.org/10.1016/j.rse.2019.01.023>
 34. Sengupta, A., Indivero, J., Gunn, C., Tfaily, M., Chu, R., Toyoda, J., Bailey, V., Ward, N.D., Stegen, J.C. (2019) Spatial gradients in soil-carbon character of a coastal forested floodplain are associated with abiotic features, but not microbial communities. *Biogeosciences*. 16 (19), 3911-3928. <https://doi.org/10.5194/bg-2019-193>
 33. Wang, W., McDowell, N.G., Ward, N.D., Indivero, J., Gunn, C., Bailey, V. (2019) Constrained tree growth and gas exchange of seawater-exposed forests in the Pacific Northwest, USA. *Journal of Ecology*. 107 (6), 2541-2552. <https://doi.org/10.1111/1365-2745.13225>
 32. Ward, N.D., Indivero, J., Gunn, C., Wang, W., Bailey, V., McDowell, N.G. (2019) Longitudinal gradients in tree stem greenhouse gas concentrations across six Pacific Northwest coastal forests. *Journal of Geophysical Research: Biogeosciences*. 124 (6), 1401-1412. <https://doi.org/10.1029/2019JG005064>

31. Ward, N.D., Morrison, E., Liu, Y., Rivas-Ubach, A., Osborne, T.Z., Ogram, A., Bianchi, T.S. (2019) Marine microbial responses related to wetland carbon mobilization in the coastal zone. *Limnology & Oceanography: Letters*. 4, 25-33. <https://doi.org/10.1002/lol2.10101>
30. Ward, N.D., Sawakuchi, H.O., Richey, J.E., Keil, R.G., Bianchi, T.S. (2019) Enhanced aquatic respiration rates associated with mixing of clearwater tributary and turbid Amazon River waters. *Frontiers in Earth Science*. 7 (101). <https://doi.org/10.3389/feart.2019.00101>
29. Zhang, X., Bianchi, T.S., Cohen, M., Martin, J.B., Quintero, C.J., Brown, A.L., Ares, A.M., Ward, N.D., Osborne, T.Z., Heffernan, J.B. (2019) Initiation and development of wetlands in southern Florida karst landscape associated with accumulation of organic matter and vegetation evolution. *Journal of Geophysical Research: Biogeosciences*. 124 (6), 1604-1617. <https://doi.org/10.1029/2018JG004921>
28. Galeron, M.-A., Radakovitch, O., Charrière, B., Volkman, J.K., Bianchi, T.S., Ward, N.D., Medeiros, P.M., Sawakuchi, H.O., Tank, S., Rontani, J.-F. (2018) Lipoxygenase-induced autoxidative degradation of terrestrial particulate organic matter in estuaries: a widespread process enhanced at high and low latitudes. *Organic Geochemistry*. 115, 78-92. <https://doi.org/10.1016/j.orggeochem.2017.10.013>
27. Joshi, I., Ward, N.D., D'Sa, E.J., Osburn, C.L., Bianchi, T.S., Oviedo-Vargas, D. (2018) Seasonal trends in surface pCO₂ and air-sea CO₂ fluxes in Apalachicola Bay, Florida from VIIRS ocean color. *Journal of Geophysical Research: Biogeosciences*. 123 (8), 2466-2484. <https://doi.org/10.1029/2018JG004391>
26. Valerio, A.M., Kampel, M., Vantrepotte, V., Ward, N.D., Sawakuchi, H.O., Less, D.F., Neu, V., Cunha, A., Richey, J.E. (2018) Using CDOM optical properties for estimating DOC concentrations and pCO₂ in the Lower Amazon River. *Optics Express*. 26 (14), A657. <https://doi.org/10.1364/OE.26.00A657>
25. Ward, N.D., Sawakuchi, H.O., Richey, J.E. (2018) The Amazon River's ecosystem—where land meets the sea. *Eos*. 99. <https://doi.org/10.1029/2018EO088573>
24. Ward, N.D., Sawakuchi, H.O., Neu, V., Less, D., Valerio, A.M., Cunha, A.C., Kampel, M., Bianchi, T.S., Krusche, A.V., Richey, J.E., Keil, R.G. (2018) Velocity-amplified microbial respiration rates in the lower Amazon River. *Limnology & Oceanography: Letters*. 3 (3), 265-274. <https://doi.org/10.1002/lol2.10062>
23. Bianchi, T.S., Butman, D., Raymond, P., Ward, N.D., Kates, R., Flessa, K.W., Zamora, H., Arellano, A., Ramirez, J., Rodriguez, E. (2017) The experimental flow to the Colorado River delta: effects on carbon cycling in a dry watercourse. *Journal of Geophysical Research: Biogeosciences*. 122 (3), 607-627. <https://doi.org/10.1002/2016JG003555>
22. Doherty, M., Yager, P.L., Moran, M.A., Satinsky, B.M., Payet, J.P., Ward, N.D., Sawakuchi, H.O., Fortunato, C., Richey, J.E., Crump, B.C. (2017) Bacterial biogeography across the Amazon river-to-ocean continuum. *Frontiers in Microbiology*. 8 (882). <https://doi.org/10.3389/fmicb.2017.00882>
21. Duan, S.W., He, Y., Kaushal, S.S., Bianchi, T.S., Ward, N.D., Guo, L., Findlay, S.E.G. (2017) Impact of wetland decline on decreasing dissolved organic carbon concentrations along the Mississippi River continuum. *Frontiers in Marine Science*. 3 (280). <https://doi.org/10.3389/fmars.2016.00280>
20. Gagne-Maynard, W., Ward, N.D., Keil, R.G., Sawakuchi, H.O., Cunha, A.C., Neu, V., Brito, D.C., Less, D., Diniz, J., Valerio, A.M., Kampel, M., Krusche, A.V., Richey, J.E. (2017) Evaluation of primary production in the lower Amazon River based on a dissolved oxygen stable isotopic mass balance. *Frontiers in Marine Science*. 4 (26). <https://doi.org/10.3389/fmars.2017.00026>

19. Joshi, I., D'Sa, E.J., Osburn, C.L., Bianchi, T.S., Ko, D., Oviedo-Vargas, D., Arellano, A., Ward, N.D. (2017) Assessing chromophoric dissolved organic matter (CDOM) distributions, stocks, and fluxes in Apalachicola Bay using combined field, VIIRS ocean color, and model observations. *Remote Sensing of Environment*. 191, 359-372. <https://doi.org/10.1016/j.rse.2017.01.039>
18. Satinsky, B., Smith, C.B., Sharma, S., Ward, N.D., Krusche, A.V., Richey, J.E., Yager, P.L., Crump, B.C., Moran, M.A. (2017) Patterns of bacterial and archaeal gene expression through the lower Amazon River. *Frontiers in Marine Science*. 4 (253). <https://doi.org/10.3389/fmars.2017.00253>
17. Sawakuchi, H.O., Neu, V., Ward, N.D., Barros, M.L.C., Valerio, A.M., Gagne-Maynard, W., Cunha, A.C., Less, D.F., Diniz, J.E., Brito, D.C., Krusche, A.V., Richey, J.E. (2017) Carbon dioxide emissions along the lower Amazon River. *Frontiers in Marine Science*. 4 (76). <https://doi.org/10.3389/fmars.2017.00076>
16. Silva, B.S.O., Coutinho, F.H., Gregoracci, G.B., Leomil, L., Oliveira, L.S.d.O., Froes, A.M., Tschoeke, D., Soares, A.C., Cabral, A.S., Ward, N.D., Richey, J.E., Krusche, A.V., Yager, P.L., Rezende, C.E. (2017) Virioplankton Assemblage Structure in the Lower River and Ocean Continuum of the Amazon. *mSphere*. 2 (5), e00366-17. <https://doi.org/10.1128/mSphere.00366-17>
15. Ward, N.D. (2017) Editorial: Integrative research on organic matter cycling across aquatic gradients. *Frontiers in Marine Science*. 4 (131). <https://doi.org/10.3389/fmars.2017.00131>
14. Ward, N.D., Bianchi, T.S., Medeiros, P.M., Seidel, M., Richey, J.E., Keil, R.G., Sawakuchi, H.O. (2017) Where carbon goes when water flows: Carbon cycling across the aquatic continuum. *Frontiers in Marine Science*. 4 (7). <https://doi.org/10.3389/fmars.2017.00007>
13. Neu, V., Ward, N.D., Krusche, A.V., Neill, C. (2016) Dissolved organic and inorganic carbon flow paths in an Amazonian transitional forest. *Frontiers in Marine Science*. 3 (114). <https://doi.org/10.3389/fmars.2016.00114>
12. Sawakuchi, H.O., Bastviken, D., Sawakuchi, A.O., Ward, N.D., Borges, C., Tsai, S.M., Richey, J.E., Ballester, M.V.R., Krusche, A.V. (2016) Oxidative mitigation of methane evasion in large Amazonian rivers. *Global Change Biology*. 22 (3), 1075-1085. <https://doi.org/10.1111/gcb.13169>
11. Seidel, M., Dittmar, T., Ward, N.D., Krusche, A.V., Richey, J.E., Yager, P.L., Medeiros, P.M. (2016) Seasonal and spatial variability of dissolved organic matter in the lower Amazon River. *Biogeochemistry*. 131 (3), 281-302. <https://doi.org/10.1007/s10533-016-0279-4>
10. Ward, N.D., Bianchi, T.S., Sawakuchi, H.O., Gagne-Maynard, W., Cunha, A.C., Brito, D.C., Neu, V., Valerio, A.M., da Silva, R., Krusche, A.V., Richey, J.E., Keil, R.G. (2016) The reactivity of plant-derived organic matter and the potential importance of priming effects in the lower Amazon River. *Journal of Geophysical Research: Biogeosciences*. 121, 1522-1539. <https://doi.org/10.1002/2016JG003342>
9. Bianchi, T.S., Thornton, D., Yvon-Lewis, S., King, G., Eglinton, T., Shields, M., Ward, N.D., Curtis, J. (2015) Positive priming of terrestrially-derived dissolved organic matter in a freshwater microcosm system. *Geophysical Research Letters*. 42 (13), 5460-5467. <https://doi.org/10.1002/2015GL064765>
8. Medeiros, P.M., Seidel, M., Ward, N.D., Carpenter, E.J., do Rosário Gomes, H., Niggemann, J., Krusche, A.V., Richey, J.E., Yager, P.L., Dittmar, T. (2015) Fate of Amazon River dissolved organic matter in the Tropical Atlantic Ocean. *Global Biogeochemical Cycles*. 29 (5), 677-690. <https://doi.org/10.1002/2015GB005115>
7. Satinsky, B.M., Fortunato, C.S., Doherty, M., Smith, C.B., Sharma, S., Richey, J.E., Ward, N.D., Krusche, A.V., Moran, M.A., Crump, B.C. (2015) Metagenomic and metatranscriptomic

- inventories of the Amazon River, May 2011. *Microbiome*. 3 (39). <https://doi.org/10.1186/s40168-015-0099-0>
6. Seidel, M., Yager, P.L., Ward, N.D., Carpenter, E.J., Gomes, H.R., de Rezende, C.E., Krusche, A.V., Richey, J.E., Dittmar, T., Medeiros, P.M. (2015) Molecular level transformations of dissolved organic matter in the river to ocean continuum of the Amazon. *Marine Chemistry*. 177 (2), 218-231. <https://doi.org/10.1016/j.marchem.2015.06.019>
 5. Ward, N.D., Krusche, A.V., Sawakuchi, H.O., Brito, D.C., Cunha, A.C., Moura, J.M.S., da Silva, R., Yager, P.L., Keil, R.G., Richey, J.E. (2015) The compositional evolution of dissolved and particulate organic matter along the lower Amazon River-Óbidos to the ocean. *Marine Chemistry*. 177 (2), 244-256. <https://doi.org/10.1016/j.marchem.2015.06.013>
 4. Ward, N.D. and Petrik-Finley, R.J. (2015). Integrating local environmental research into an inquiry-based unit on biogeochemical principles in a high school science classroom. *The Earth Scientist-NESTA*. 31(2), 21-28
 3. Ward, N.D., Finley, R.J., Keil, R.G., Clay, T.G. (2013) Benefits and limitations of iPads in the high school science classroom and a trophic cascade lesson plan. *Journal of Geoscience Education*. 61(4), 378-384. <https://doi.org/10.5408/13-008.1>
 2. Ward, N.D., Keil, R.G., Medeiros, P.M., Brito, D.C., Cunha, A.C., Dittmar, T., Yager, P.L., Krusche, A.V., Richey, J.E. (2013) Degradation of terrestrially derived macromolecules in the Amazon River. *Nature Geoscience*. 6 (7), 530-533. <https://doi.org/10.1038/ngeo1817>
 1. Ward, N.D., Keil, R.G., Richey, J.E. (2012) Temporal variation in river nutrient and dissolved lignin phenol concentrations and the impact of storm events on nutrient loading to Hood Canal, Washington, USA. *Biogeochemistry*. 111 (1-3), 629-645. <https://doi.org/10.1007/s10533-012-9700-9>

Other Publications

3. Sengupta, A., Ward, N.D., Stegen, J. (2022, preprint) Discoverability of open data is critical to Earth system science. *EarthArXiv*. <https://doi.org/10.31223/X5FM0N>
2. Pacific Northwest National Laboratory (2019) STAR Workshop: Terrestrial-Aquatic Research in Coastal Systems. PNNL-28635. Pacific Northwest National Laboratory, Richland, Washington. Workshop Chairs: Megonigal, P. and Ward, N.D. <https://www.pnnl.gov/publications/star-workshop-terrestrial-aquatic-research-coastal-systems>
1. Ward, N.D., Bianchi, T.S., Medeiros, P.M., Seidel, M., Keil, R.G., Robinson, C. (2017) E-Book: Integrative research on organic matter cycling across aquatic gradients. *Frontiers in Marine Science*. <http://doi.org/10.3389/978-2-88945-212-5>

Manuscripts in Review/Revision

10. Bonin, P., Portas, A., Hardy, J., Guasco, S., Bianchi, T.S., Ward, N.D., Rontani, J.-F. (in review) Biological mechanisms underlying remineralization of vascular plant material in the presence of diatoms. Submitted to *Limnology and Oceanography*
9. Hopple, A., Doro, K.O., Bailey, V.L., Bond-Lamberty, B., McDowell, N., Morris, K., Myers-Pigg, A., Pennington, S., Regier, P., Rich, R., Sengupta, A., Smith, R., Stegen, J., Ward, N.D., Woodard, S.C., Megonigal, J.P. (in review) Attaining freshwater and estuarine-water soil saturation in an ecosystem-scale coastal flooding experiment. Submitted to *Environmental Monitoring and Assessment*
8. Hou, Z.J., Ward, N.D., Myers-Pigg, A., Lin, X., Waichler, S., Wiese Moore, C., Norwood, M.J., Regier, P., Yabusaki, S. (in review) Quantifying drivers of methane hydrobiogeochemistry in a tidal river floodplain system. Submitted to *Environmental Research Letters*

7. Li, X., Sun, J., Zhang, H., Tan, H., Hui, R., Qi, J., Zhang, P., Ward, N.D., (in review) Warming decreases desert ecosystem functioning by altering biocrusts in drylands. Submitted to *Ecology*
6. Mu, L., Page, B.P., Ward, N.D., Krusche, A.V., Montebelo, A., Rezende, C.E., Medeiros, P.M., Richey, J.E., Yager, P.L. (in review) Carbonate and nutrient contributions from the Amazon River to the western tropical North Atlantic Ocean. Submitted to *Global Biogeochemical Cycles*
5. Neu, V., Araújo, M.G., Guedes, V. Ward, N.D., Ribeiro, M.M., Richey, J.E., Krusche, A.V. (in review) Composition and flow of dissolved and particulate carbon and nitrogen in the lower Tocantins River. Submitted to *Journal of Geophysical Research: Biogeosciences*
4. Patel, K., McKeever, S.A., Crump, A.R., Norwood, M.J., Fansler, S.J., Ward, N.D., Moran, J., R., Evans, D., Bailey, V.L. (in review) Dissolved organic substrate is more readily available for mineralization than mineral-bound substrate. Submitted to *Soil Biology and Biochemistry*
3. Regier, P., Duggan, M., Myers-Pigg, A., Ward, N.D. (in review). Effects of random forest modeling decisions on biogeochemical time series predictions. Submitted to *Limnology & Oceanography: Methods*
2. Rocha, I.F.C., Brito, D.C., Cunha, A.C.C., Diniz, J.E.M., Ward, N.D., Richey, J.E. (accepted) Análise de vazão e de fluxo de sedimentos suspensos dos canais norte e sul do Rio Amazonas. *Revista Ibero-Americana de Ciências Ambientais*
1. Telfeyan, K., Piliouras, A., Myers-Pigg, A., Newman, B., Ward, N.D., Moran, J.J., Rowland, J. (in review). Resolving spatiotemporal variations of tidal hydrodynamics in a macrotidal marsh-forest setting using geochemical and stable isotope methods. Submitted to *Hydrological Processes*

Current Research Funding

- Bailey, V. (PI), Chen, X. (Co-PI), Weintraub (Co-PI), Megonigal, J.-P. (Chief Scientist), Ward, N.D. (Task 1 Lead), Kemner, K. (Task 1 Co-Lead), Bond-Lamberty, B. (Task 2 Lead), Wainwright, H. (Task 2 Co-Lead). *Coastal observations, mechanisms, and predictions across systems and scales: field measurements and experiments (COMPASS-FME)*. U.S. Department of Energy-BER. 10/1/20-9/30/23. \$17,500,000
- Carter, B.R., Khangaonkar, T., Eisaman, M., Feely, R.A., Ward, N.D., Subban, C., Premathilake, L., Pilcher, D. *Electrochemical Acid Sequestration to Ease Ocean Acidification (EASE-OA)*. NOAA, Climate Works, and DOE WPTO. 08/2022-07/2024. \$750,000
- Cotter, E. (PI), Cavagnaro, R. (Co-I), Ward, N.D. (Co-I), Walters, E. (Co-I), Regier, P. (Co-I), *Autonomous mapping of carbon dioxide removal in coastal environments*. EED Laboratory Directed Research and Development. 10/1/2021-9/30/2022. \$125,000
- Hood, G. (PI-social track), Smith, D. (Co-PI-social track), Ward, N.D. (PI-technical track). *Sea Level Rise-Driven Groundwater Flooding and Salinity Intrusion in the Skagit Delta: Agricultural Challenges and Habitat Restoration Opportunities*. Pew Charitable Trusts. 6/1/2022-5/31/2023. \$150,000
- Johnson, P. (PI), Ward, N.D. (Co-PI), Abadi, S. (Co-PI) *Methane Venting from Forearc Faults in the Puget Sound Estuary*. NSF OCE - Marine Geology and Geophysics. 9/1/2022-8/31/2024. \$508,624
- Kukkadapu, R. (PI), Ward, N.D. (Co-PI), Regier, P. (Co-I), China, S. (Co-I), Engelhard, M. (Co-I), Zhao, Q. (Co-I), Huggett, N. (Co-I), Chu, R. (Co-I), Kovarik, L. (Co-I), Bowden, M. (Co-I). *Integration of mineral-associated organic matter (MAOM) colloid characteristics into DOM stability models*. EMSL Intramural S&T Program. 10/1/2021-9/30/2023. \$390,529
- Richey, J.E. (PI), Ward, N.D. (Co-PI), Keil, R.G. (Co-PI). *Biogeochemical Blindspots along the Lower Amazon River Continuum*. NSF DEB Ecosystems Studies. #1754317. 06/18-05/23. \$795,339

- Subban, C. (PI), Ward, N.D. (Co-I), Edmundson, S. (Co-I), Myers, C. (Co-I), Regier, P. (Co-I), Huesseman, M. (Co-I) *Optimizing biological carbon uptake by regulating carbonate-bicarbonate equilibrium*. EED Laboratory Directed Research and Development. 12/1/2021-9/30/2022. \$125,000
- Hornstein, B. (PI), Bramall, N. (Co-PI), Ward, N.D. (Co-PI) *Autonomous monitoring of low phosphate concentrations at terrestrial aquatic interfaces*. Small Business Innovation Research. 2/14/2022-2/13/2023. \$200,000
- Ward, N.D. (PI). *Quantum Kinetics Water Treatment Characterization*. Quantum Kinetics, LLC. 12/1/20-12/1/22. \$45,000
- Ward, N.D. (PI), Myers-Pigg, A. (Co-I) *Identifying dynamic sources and transformations of dissolved organic matter in coastal watersheds exposed to extreme flooding*. DOE-EMSL Large-Scale Research: Environmental Sciences, Project #51347. 10/1/20-9/30/22. 4,080 hours of instrument use (\$150,071 in kind support)
- Zheng, J. (PI), Bailey, V. (Co-PI), Pennington, S., Ward, N.D., Myers-Pigg, A., Bond-Lamberty, B., Hopple, A., Weisenhorn, P., Spanbauer, T., Megonigal, P. *Illuminating soil biogeochemical responses to press and pulse disturbances in a coastal ecosystem*. EMSL and DOE JGI Facilities Integrating Collaborations for User Science, Project #60036. 8/1/2021-9/30/2023. 1,060 hours of instrument use and 500,000 hours computing time (\$114,629 in kind support)

Pending Grant Proposals

- Alberti, M. (PI), Marshall, J. (Co-PI), Baker, J. (Co-PI), Beck, D. (Co-PI), Brown, D. (Co-PI), Butman, D. (Co-PI), Mauger, G. (Co-PI), Min, E. (Co-PI), Neumann, R. (Co-PI), Salathé, E. (Co-PI), Schwartz, D. (Co-PI), Sun, N. (Co-PI), Turner, A. (Co-PI), Voisin, N. (Co-PI), Ward, N.D. (Co-PI). *The Puget Sound Urban Integrated Field Laboratory (PSUIFL)*. U.S. Department of Energy-BER. 8/1/2022-7/31/2027. \$25,000,000

Previous Research Funding (\$3,105,630 total; \$318,662 in kind support)

- Cavagnaro, R. (PI), Ward, N.D. (Co-I), Alam, J. (Co-I), Matzner, S. (Co-I), Williams, N. (Co-I) *Autonomous energy harvesting for an autonomous surface vehicle*. DOE Water Power Technologies Office, Marine Energy Lab Seedling Program. \$100,000. 10/1/2019-9/30/2020
- Gill, G. (PI), Grate, J. (Co-I), Kuo, L.J.(Co-I), Ward, N.D. (Co-I, project manager) *Persistent monitoring of dissolved oxygen for investigations of biogeochemical cycles across the terrestrial/aquatic ecosystem interface*. U.S. Department of Energy-BER, Subsurface Biogeochemical Research, Small Business Innovation Research. 02/21/17-3/20/22. \$335,000
- Hou, Z. (PI), Ward, N.D. (Co-I), Yabusaki, S. (Co-I) *Assessing uncertainty and parameter sensitivity in the representation of methane processes in coastal floodplain ecosystems*. PNNL Laboratory Directed Research & Development. 1/2020-9/30/2020. \$120,000
- Kreisel, J. (PI), Moran, J. (Co-PI), Ward, N.D. (Co-PI). *Terrestrial-aquatic isotope sensor for in-situ field measurements*. U.S. Department of Energy-BER, Subsurface Biogeochemical Research, Small Business Innovation Research. 2/16/21-11/22/21. \$250,000
- Stegen, J. (PI), Ward, N.D. (Co-PI), Bailey, V. (Co-PI). *Process-based understanding of perturbation impacts in tidally-influenced nearshore terrestrial-aquatic interfaces*. PNNL Laboratory Directed Research & Development. 8/1/2017-8/30/20. \$906,313
- Ward, N.D. (PI), Bailey, V. (Co-PI), Stegen, J., Yabusaki, S., Sengupta, A. *Hydrologic imprinting across terrestrial-aquatic gradients: unraveling the spectrum of ecosystem responses to freshwater limitation and salt exposure*. DOE-EMSL Science Theme Research, Project #50234. 10/1/18-3/31/21. 580 hours of instrument use (\$75,359 in-kind support)

- Ward, N.D. (PI), McDowell, N. (Co-PI). *A critical gap in our ability to quantify and model earth system interactions—Development of a global, mechanistic understanding of methane emissions from trees*. PNNL LDRD Open Call FY19-20. 10/01/18-9/30/20. \$302,000
- Ward, N.D. (PI), Borde, A. (Co-PI), Bailey, V. (Co-PI). *Hydrologic imprinting across terrestrial-aquatic gradients: unraveling the spectrum of ecosystem responses to freshwater availability*. PNNL Laboratory Directed Research & Development. 11/2017-9/30/20. \$772,317
- Zimmerman, R. (PI), Ward, N.D. (Co-PI). *Experimental Impacts of Climate Warming and Ocean Acidification on Blue Carbon Accumulation by Eelgrass*. EMSL and DOE JGI Facilities Integrating Collaborations for User Science, Project #50358. 10/1/18-3/31/21. 2,144 hours of instrument use (\$123,303 in-kind support)
- Bianchi, T.S. (PI), Butman, D. (Co-PI), Ward, N.D. (Co-PI) *The Influence of Microbial Priming Effects on the Carbon Balance of Large River Reservoirs*. U.S. Department of Energy-BER Subsurface Biogeochemical Research #DE-SC0019382. 10/2018-9/2019. \$200,000
- Bianchi, T.S. (PI), Ward, N.D. (Co-PI), Ogram, A. (Co-PI). *The role of priming effects on the conversion of blue carbon to CO₂ in the coastal zone*. EMSL and DOE JGI Facilities Integrating Collaborations for User Science, Project #49505. 10/1/2016-9/31/2018. 932 hours of instrument use. Roughly \$120,000 in-kind support
- Ward, N.D. (PI), Cailene Gunn (Co-PI), Julia Indivero (Co-PI) *ECO-Citizens: Empowering local citizen scientists to monitor water quality using a mobile app*. PNNL Quickstarter. 4/1/18-9/30/18. \$4,000
- Ward, N.D. (PI), Rivas-Ubach, A. (Co-PI), Liu, Y. (Co-PI), Kuo, L.J. (Co-PI) *Metabolic responses of eelgrass to environmental stressors*. PNNL Energy & Environment Directorate, Laboratory Directed Research and Development. 10/1/2017-9/30/2018. \$76,000
- Ward, N.D. (PI). *Development and deployment of a novel approach for studying tree gas exchange*. PNNL Energy & Environment Directorate LDRD. 10/01/18-9/30/19. \$30,000
- Ward, N.D. (PI). *Open access publication fee grant for special issue in Frontiers in Marine Science*. Gordon and Betty Moore Foundation. 10/1/2016-9/30/2017. \$10,000

Current Analytical Service Contracts (\$809,251 total)

- Alcoa/Lavaca Bay Superfund: Analysis of mercury in water and fish tissue samples to understand the degree of contamination and recovery throughout the site. 3/1/17-12/31/20. \$170,880
- Gulf of Maine Department of Environmental Protection: As part of the state of Maine Surface Water Ambient Toxics (SWAT) Monitoring Program mercury and trace metal levels are monitored in fish and shellfish tissues. 10/10/16-12/31/20. \$142,905
- City of Greeley: Total mercury is measured in wastewater samples quarterly to assess the efficiency of the city's wastewater treatment facility for mercury removal and verify compliance with permitted mercury discharge levels. 12/16-2/28/25. \$38,482
- Hecla Mining Company-Greens Creek: Mercury, trace metals, total recoverable metals, and physical chemistry are evaluated in fresh (monthly) and seawater (quarterly) samples near the Hecla Mining Company operations in Juneau, Alaska. 3/1/2020-2/28/2024. \$478,410

Past Analytical Service Contracts (\$645,339 total)

- City of Eugene: The speciation of mercury in wastewater is evaluated on a quarterly basis to satisfy requirements of the State of Oregon for municipal treatment. 12/16-4/30/19. \$28,291

- Environ/US Steel: Total mercury levels are measured in the outfalls of steel mills in an effort to understand the sources of Hg in the steel production process and help guide the plant modifications, planned by US Steel to improve waste treatment practices in order to meet stringent Great Lakes regional Hg outfall requirements. 1/1/17-12/31/20. \$274,678
- Hecla Mining Company-Greens Creek: Mercury, trace metals, total recoverable metals, and physical chemistry are evaluated in fresh (monthly) and seawater (quarterly) samples near the Hecla Mining Company operations in Juneau, Alaska. 3/1/2017-2/28/2020. \$342,370

External Service and Leadership

Review Editor: 2nd State of the Carbon Cycle Report (SOCCR-2), Chapter 14: Inland Waters

Associate Editor: *Marine Chemistry* (2020-present); *Frontiers in Marine Science* (2022-present)

Academic Editor (2018-present): *PLOS One*

Guest Associate Editor (2015-2019):

Frontiers in Marine Science: [Integrative Research on OM Cycling Across Aquatic Gradients](#)

Frontiers in Earth Science: [The Role of Priming in Terrestrial and Aquatic Ecosystems](#)

Manuscript Reviewer: *Acta Amazonica; Biogeochemistry; Biogeosciences; Biogeosciences:*

Discussions; Cell Press: One Earth; Chemical Geology; Environmental Pollution; Environmental Science and Pollution Research; Environmental Science: Water Research & Technology; Estuaries and Coasts; Estuarine, Coastal and Shelf Science; Frontiers in Marine Science; Geochimica et Cosmochimica Acta; Geophysical Research Letters; Global Biogeochemical Cycles; Global Change Biology; Hydrology and Earth System Science; International Journal of Analytical Chemistry; Journal of Geophysical Research: Atmospheres; Journal of Geophysical Research: Biogeosciences; Journal of Hydrology; Journal of Limnology; Journal of Marine Geology; Limnology and Oceanography; Limnology and Oceanography: Letters; Limnology and Oceanography: Methods; Nature Communications; Nature: Communications Earth & Environment; Nature Geoscience; New Phytologist; Organic Geochemistry; PLOS One; Reviews of Geophysics; Science Advances; Science of the Total Environment; Scientific Reports; Water Research

Panel Reviewer: US Department of Energy Environmental System Science, 2018

Proposal Reviewer: American Chemical Society Petroleum Research Fund; British Ecological Society; European Research Council Consolidator Grants; NSF Chemical Oceanography; NSF Low Temperature Geochemistry; US Department of Energy Laboratory Directed Research & Development; US Department of Energy Subsurface Biogeochemical Research Small Business Innovation Research; US Department of Energy Office of Science Graduate Student Research Program

Workshop Co-Chair: System for Terrestrial-Aquatic Research Workshop. Richland, WA, 2018

Town Hall Convener:

- 2020 American Geophysical Union Fall Meeting, San Francisco, CA. *New and expanding community-driven research programs to understand watershed and coastal processes*

Session Convener:

- 2022 ASLO Ocean Sciences Meeting. Honolulu, HI. *Transformation and fate of terrestrial organic matter at the Land-Ocean Interface and Beyond*
- 2022 ASLO Ocean Sciences Meeting. Honolulu, HI. *Biogeochemical dynamics at the terrestrial-aquatic interface*

- 2021 AGU Fall Meeting. New Orleans, LA. *Integrating and advancing understanding of coastal ecosystem structure, function and dynamics*
- 2021 ASLO Aquatic Science Meeting. Mallorca, Spain. *Biogeochemical cycling from catchments to coastal waters: processes, models and budgets*
- 2020 ASLO Ocean Sciences Meeting, San Diego, CA. *The transformation and fate of carbon at the land-ocean interface*
- 2019 American Geophysical Union Fall Meeting, San Francisco, CA. *Hydrological and biogeochemical connectivity across coastal watersheds and estuaries: linking terrestrial and aquatic processes*
- 2019 ASLO Aquatic Science Meeting. San Juan, PR. *Carbon Cycling Across Gradients in the Land-Ocean-Continuum*
- 2018 ASLO Ocean Sciences Meeting, Portland, OR. *Land-Sea Connections in the Global Carbon Cycle*
- 2018 Goldschmidt Conference, Boston, MA. *Critical Zone Dynamics Through Space and Time: Linkages with Weathering and Global Biogeochemical Cycles*
- 2018 American Geophysical Union Fall Meeting, Washington, D.C. *Comparative organic geochemistry of soils and aquatic sediments: A new view in the 21st century*
- 2018 ASLO Summer Meeting, Victoria, BC. *The Biogeochemistry of Organic Matter: Cutting across Ecosystem Boundaries and Aquatic Gradients*
- 2017 ASLO Aquatic Science Meeting. Honolulu, HI. *Organic Matter Cycling Across Aquatic Boundaries*

Professional Affiliations

- American Association for the Advancement of Science (2015-present)
- American Geophysical Union (2011-present)
- Association for the Sciences of Limnology and Oceanography (2012-present)
- Geochemical Society (2018-present)
- National Science Teachers Association (2012-2016)

PNNL Service and Leadership

Search Committee Member:

- 2021 Berkeley Lab, Coastal Research Community Engagement Manager
- 2020-2021 Atmospheric Sciences and Global Change Division, Division Director
- 2021 Environmental & Biological Sciences Directorate, Sr. Coastal Computational Scientist
- 2020 Environmental & Biological Sciences Directorate, Sr. Coastal Ecosystem Scientist
- 2020 Energy & Environment Directorate, Chief Marine Chemist
- 2019 Energy & Environment Directorate, Principal Biogeochemist
- 2018-2019 Environmental & Biological Sciences Directorate, Chief Ecosystem Scientist

Strategy Development Team Member

- 2020-2021 Sensors Strategy Working Group
- 2020-2021 Marine Carbon Dioxide Removal Working Group
- 2020 Biosciences Strategic Plan

- 2020 Coastal and Marine Sciences Strategic Plan
- 2019-2020 Marine and Coastal Research Laboratory Research Council

Honors and Awards

- 2021 PNNL Outstanding Performance Award for Onsite Supervisor Role during Pandemic
- 2020 PNNL Earth and Biological Sciences Director Bringing Excellence in S&T (BESTie) Award
- 2020 PNNL Coastal Sciences Division Publication of the Year
- 2020 AGU Editor's Citation for Excellence in Refereeing (2019), *JGR: Biogeosciences*
- 2018 PNNL STEM Ambassador Fellow
- 2018 AGU Editor's Citation for Excellence in Refereeing (2017), *JGR: Biogeosciences*
- 2018 PNNL Outstanding Performance Award—ISO 14001 Audit Team
- 2017 PNNL Energy and Environment Directorate Publication of the Year
- 2017 ASLO Aquatic Sciences Meeting Early Career Scientist Travel Grant
- 2012 National Science Foundation GK-12 teaching fellowship
- 2008 UCSD Sports Clubs Male Athlete of the Year
- 2007 UCSD Dean of Physical Sciences Undergraduate Award for Excellence
- 2007 National Science Foundation REU Summer Student Fellowship
- 2004 Antone Ara Bia Scholarship

Invited Presentations

30. Ward, N.D. (2022, invited). COMPASS-FME: A new network of field sites, experiments, and models for elucidating the impact of episodic and chronic disturbances on coastal ecosystem structure and function. OCB Workshop: C-saw—Time domain controls on carbon storage, release, and transformation in coastal and estuarine waters following extreme events. Raleigh, NC. 10/24/22
29. Ward, N.D. (2022, invited) Modeling impacts of inundation disturbances on coastal groundwater and ecosystem dynamics. DOE-BER Earth System Science PI Meeting. Virtual conference. 5/26/22
28. Coppola, A., Santin, C., Wagner, A., Ward, N.D., Seidel, M., Dittmar, T., Jones, M. (2021, invited) Global synthesis on the interconnectivity of black carbon through the land-river-ocean continuum. ASLO Aquatic Sciences Meeting. Virtual Meeting. 6/24/21
27. Ward, N.D., Yabusaki, S., Myers-Pigg, A., McDowell, N., Wang, W., Norwood, M., Regier, P., Bond-Lamberty, B., Sengupta, A., Pennington, S., Bailey, V., Magonigal, J.P. (2021, invited) Ecological, hydrological, and biogeochemical interactions in coastal floodplains. SWS Annual Meeting. Spokane, WA. 6/4/21
26. Ward, N.D. (2021, invited plenary) ESS Community Updates: A Community Driven Exploration of Coastal Hydrobiogeochemistry Across a Network of Gradients and Experiments (EXCHANGE). DOE-BER Earth System Science PI Meeting. Virtual conference. 8/18/21
25. Bailey, V., Sengupta, A., Myers-Pigg, A., Pennington, S., Bond-Lamberty, B., McDowell, N., Magonigal, P., Stegen, J., Tan, Z., Ward, N.D., Yabusaki, S., Zheng, J. (2020, invited) Salinity and inundation alter biogeochemistry and carbon fluxes in two coastal forests. Goldschmidt Conference. Honolulu, HI. 6/21/20

24. Morrison, E., Liu, Y., Rivas-Ubach, A., Ward, N.D., Y., Osborne, T.Z., Bianchi, T.S., (2020, invited) The role of microbial communities in the turnover of blue carbon-derived dissolved organic matter. ESA Annual Meeting. Salt Lake City, UT. 8/3/20
23. Sengupta, A., Bond-Lamberty, B., Rivas-Ubach, A., Zheng, J., Handakumbura, P., Yabusaki, S., Bailey, V., Stegen, J., Ward, N.D. (2020, invited) Linking molecular properties of soil organic carbon to emergent ecosystem functions in a tidally influenced landscape of the Pacific Northwest. EGU General Assembly. Vienna, Austria. 5/3/20
22. Sengupta, A., Kaufman, M.H., Renteria, L., Torgeson, J., Garcia, M.R., Chen, H., Garyburu-Carasco, V.A., Rivas-Ubach, A., Chu, R.K., Toyoda, J., Ward, N.D., Zheng, J., Stegen, J.C. (2020, invited) Biogeochemical impacts of salinity in coastal river corridors: From molecular processes to emergent function. AGU Fall Meeting. Virtual conference. 12/14/20
21. Ward, N.D. (2020, invited) Plant, soil, and water interactions across the coastal interface. Texas A&M University Oceanography Department. College Station, TX. 4/27/20
20. Ward, N.D. (2020, invited) Dynamic interactions between plants, soil, and water at the coastal interface. University of Washington, School of Oceanography. Seattle, WA. 5/15/20
19. Ward, N.D. and Norwood, M. (2020, invited) Mechanistic understanding of methane emissions from trees. PNNL Lab Fellows Science and Technology Symposium. Richland, WA 2/19/20
18. Ward, N.D. (2019, invited) Progress and priorities for understanding terrestrial-aquatic interfaces: An Aquatic Biogeochemical Perspective. DOE-BER Earth System Science PI Meeting. Potomac, MD. 4/30/19
17. Yabusaki, S., Ward, N.D., Waichler, S.R., Myers-Pigg, A.N., Sengupta, A., Zheng, J., Chen, X., Fang, Y., Duan, Z., Serkowski, J., Indivero, J., Gunn, C., Bailey, V. (2019, invited) Insights on inundation and hydrobiogeochemistry in a first-order tidal stream floodplain. Geological Society of America Annual Meeting. Phoenix, AZ. 9/22/19
16. Bianchi, T.S., Morrison, E.M., Shields, M., Ward, N.D. (2018, invited plenary) Re-plumbing the Earth's surface: New corridors for organismal and biogeochemical change. AGU Fall Meeting. 12/13/18
15. Kuhn, C., Valerio, A., Ward, N.D., Loken, L., Sawakuchi, H.O., Kampel, M., Richey, J.E., Stadler, P., Crawford, J., Striegl, R.G., Vermote, E., Pahlevan, N. Butman, D. (2018, invited) Assessment of atmospheric correction methods for Landsat-8 and Sentinel-2 over large rivers. AGU Fall Meeting. Washington, D.C. 12/13/18
14. Ward, N.D. (2018, invited) Hydrologic and biogeochemical linkages along the coastal interface. Washington State University Science Seminar Series. Vancouver, WA. 10/29/18
13. Ward, N.D. (2018, invited) Linked hydrologic and biogeochemical cycling dynamics across coastal terrestrial-aquatic interfaces. International Workshop on Organic Carbon Cycling in Marine Environments. Qingdao, China. 10/14/18
12. Ward, N.D., Indivero, J., Gunn, C., Wang, W., McDowell, N.G. (2018, invited) Exploring Western Washington watersheds: Insights on terrestrial and aquatic linkages. Hood Canal Salmon Enhancement Group Annual Membership Meeting Keynote Speech. Belfair, WA. 3/29/18
11. Ward, N.D. (2017, invited) Tidal rivers: A major gap in earth systems science. Old Dominion University. Norfolk, Virginia. 9/12/17
10. Ward, N.D. (2017, invited) Biogeochemistry of the Columbia River. University of Washington ESRM429 Seminar Series. Seattle, WA. 5/23/17
9. Ward, N.D. (2016, invited) Net ecosystem exchange of carbon in the lower Amazon River. Howard T. Odum Center for Wetlands: Water, Wetlands & Watersheds seminar series. Gainesville, FL. 8/31/16

8. Ward, N.D. and Bianchi, T.S. (2016, invited) The fate of terrestrial DOM: priming in aquatic ecosystems. Gordon Research Conference: Organic Geochemistry. Holderness, NH. 7/25/16
7. Ward, N.D. Sawakuchi, H.O., Bianchi, T.S., Gagne-Maynard, W., Cunha, A.C., Brito, D.C., Neu, V., da Silva, D.F., Diniz, J.E.M. Valerio, A.M., da Silva, R., Krusche, A.V., Richey, J.E., Keil, R.G. (2016, invited). Hydrodynamic controls on respiration in the Amazon River and the importance of particle interactions on organic matter decomposition. AGU Fall Meeting. San Francisco, CA. 12/13/16
6. Richey, J.E., Ward, N.D., et al (2015, invited) The “Pulse” of the Amazon River System: How pCO₂ Evolves, from Small Streams to the Atlantic Ocean. AGU Fall Meeting. San Francisco, CA
5. Ward, N.D., et al. (2014, invited). The reactivity of plant-derived organic matter in the Amazon River. AGU Fall Meeting. San Francisco, CA. 12/15/14
4. Crump, B.C., Doherty, M., Fortunato, C.S., Simon, H.M., Smith, M.W., Krusche, A.V., Brito, D., Cunha, A.C., Fernandes, M., Zielinski, B., Paul, J.H., Ward, N.D., Richey, J.E., Satinsky, B.M., Sharma, S., Smith, C.B., Moran, M.A., Yager, P.L. (2013, invited) Microbial community composition and metagenomes across the river-to-ocean continuum of the Columbia and Amazon Rivers. AGU Fall Meeting. San Francisco, CA. 12/13/13
3. Yager, P.L., Richey, J.E., Page, B.P., Ward, N.D., Krusche, A.V., Weber, S., Montoya, J.P., Rezende, C.E. (2013, invited) Contributions from the Amazon River mouth to the carbonate and nutrient dynamics of the tropical Atlantic Ocean. AGU Fall Meeting. San Francisco, CA. 12/11/13
2. Ward, N.D. (2012, invited) The hydrologic and geochemical evolution of the lower Amazon River. UW Water Center Symposium. Seattle, WA. 4/18/12
1. Ward, N.D., Keil, R.G., Richey, J.E. (2010, invited) Impacts of storm events on nutrient loading to the lower Hood Canal region. UW Water Center Symposium. Seattle, WA. 2/17/10

Conference Proceedings

145. Ghosh, R., Freeman, M., Ball, T., Regier, P., Ward, N.D. (2022) Seasonal and Tidally Driven Oxygen Dynamics in a Coastal Floodplain: Insights from Multi-year High Frequency Observations. Grand Rapids, MI. 5/14/2022
144. Ghosh, R., Loloee, R., Freeman, M., Ball, T., Williams, K., Regier, P., Ward, N.D. (2022) Multi-year Temporally Resolved Oxygen Dynamics at the Terrestrial-Aquatic-Interface of an Estuarine Floodplain and an Alpine Hillslope-Floodplain Continuum: Implications for Biogeochemical Processes Across Seasons. ASLO Ocean Sciences Meeting. Honolulu, HI. 2/27/2022
143. Regier, P., Izquierdo, A., Myers-Pigg, A., Ward, N.D., EXCHANGE Consortium (2022) Impacts of inundation on greenhouse gases at the coastal terrestrial-aquatic interface. Joint Aquatic Sciences Meeting. Grand Rapids, MI. 5/14/2022
142. Regier, P., Ward, N.D., Myers-Pigg, A. (2022) Spatiotemporal dynamics and drivers of dissolved oxygen across a coastal floodplain: improving coastal biogeochemistry representations in Earth system models. ASLO Ocean Sciences Meeting. Honolulu, HI. 2/27/2022
141. Bailey, V.L., Megonigal, J.P., Chen, X., Weintraub, M., Thornton, P., Bond-Lamberty, B., Kemner, K., Ward, N.D., Bridgeman, T., Brown, B., Johnson, L., McDowell, N. (2021) Coastal observations, mechanisms, and predictions across systems and scales – field measurements and experiments. DOE-BER Earth System Science PI Meeting. Virtual conference. 8/18/21
140. Bianchi, T.S., Shields, M., Butman, D., Ward, N.D., Rivas-Ubach, A., Chu, R. (2021) Dissolved organic matter transformations along the Columbia River and its tributaries. AGU Fall Meeting. New Orleans, LA. 12/13/21

139. Dong, X., Cohen, M.J., Martin, J.B., McLaughlin, D.L., Murray, A.B., Ward, N.D., Flint, M.K., Heffernan, J.B. (2021) Ecohydrologic processes and soil thickness feedbacks control limestone-weathering rates in a karst landscape. Geological Society of America Connects. Portland, OR. 10/10/21
138. Hopple, A., Megonigal, P., Pennington, S., Bond-Lamberty, B., McDowell, N., Myers-Pigg, A., Ward, N.D., Rich, R., Stegen, J., Kemner, K., Doro, K., Bailey, V. (2021) Gaining a predictive understanding of coastal ecosystem responses to pulse salinity and inundation disturbance. AGU Fall Meeting. New Orleans, LA. 12/13/21
137. Hopple, A., Megonigal, P., Pennington, S., Bond-Lamberty, B., McDowell, N., Myers-Pigg, A., Ward, N.D., Rich, R., Stegen, J., Kemner, K., Doro, K., Thornton, P., O'Meara, T., Bailey, V. (2021) Gaining a predictive understanding of coastal ecosystem responses to press and pulse hydrologic disturbance. DOE-BER Earth System Science PI Meeting. Virtual conference. 8/18/21
136. Kreisel, J., Fahrland, A., Moran, J., Ward, N.D. (2021) In-situ methane isotope analyzer for coastal and deep-ocean environments. AGU Fall Meeting. New Orleans, LA. 12/13/21
135. Myers-Pigg, A., Johsens, L., Patel, K.F., Hopple, A., Regier, P., Norwood, M.J., Ward, N.D., Kemner, K., Megonigal, P., Bailey, V. (2021) Changes in quality and quantity of solubilized soil organic matter at the upland-coastal interface due to seawater exposure. AGU Fall Meeting. New Orleans, LA. 12/13/21
134. Regier, P., Ward, N.D., Myers-Pigg, A., Indivero, J., Wiese Moore, C. (2021, oral) Groundwater oxygen dynamics. 7th Annual Global Change Research Wetland (GCRew) Symposium. Virtual conference. 4/24/21
133. Telfeyan, K., Piliouras, A., Newman, B., Myers-Pigg, A., Ward, N.D., Rowland, J. (2021). Field methods and geochemical analyses for interpreting high resolution hydrogeochemical changes in a macrotidal marsh. Goldschmidt Conference. Lyon, France. 7/5/21
132. Thornton, P., Bond-Lamberty, B., Brown, B., Enguehard, L., Holmquist, J., McDowell, N., Myers-Pigg, A., Pennington, S., O'Meara, T., Regier, P., Wainwright, H., Ward, N.D. (2021) COMPASS-FME: Early Successes in Data Synthesis and Modeling Analysis. DOE-BER Earth System Science PI Meeting. Virtual conference. 8/18/21
131. Ward, N.D., Myers-Pigg, A., Norwood, M., Regier, P., Weintraub, M., Megonigal, J.P., Bailey, V. (2021) A Community Driven Exploration of Coastal Hydrobiogeochemistry Across a Network of Gradients and Experiments (EXCHANGE). ASLO Aquatic Sciences Meeting. Virtual conference. 6/22/21
130. Bianchi, T.S., Butman, D., Ward, N.D., Shields, M., Arntzen, E., Stegen, J., Indivero, J., Farris, Y., Rivas-Ubach, A., Tolic, N., Chu, R. (2020, poster) The hydro-bio-geochemistry of the Columbia River tributary confluences. DOE Earth System Science PI Meeting. Bethesda, MD. 5/19/20
129. Ghosh, R., Ball, T., Freeman, M., Loloee, R., McIntire, C., Shooltz, D., Gill, G., Myers-Pigg, A., Ward, N.D. (2020, oral) Rapid Variability in Subsurface Dissolved Oxygen along the Terrestrial-Aquatic-Interface Driven by Tidal Inundation. Ocean Sciences Meeting. San Diego, CA. 2/18/20
128. Hopple, A.M., Bond-Lamberty, B., Pennington, S., Megonigal, J.P., Raczka, N.C., Brzostek, E.R., Ward, N.D., Bailey, V.L. (2020) Understanding the response of coastal forest carbon cycling to changing salinity and moisture content: a soil transplant experiment. AGU Fall Meeting. Virtual conference. 12/14/20
127. Hopple, A.M., Bond-Lamberty, B., Pennington, S., Megonigal, J.P., Raczka, N.C., Brzostek, E.R., Ward, N.D., Bailey, V.L. (2020) Understanding the response of coastal forest carbon cycling to changing salinity and moisture content: a soil transplant experiment. International Symposium of Physiological Processes in Roots of Woody Plants. University Park, PA. 6/22/20

126. Hou, Z., Ward, N.D., Yabusaki, S.B., Waichler, S.R., Norwood, M.J., Myers-Pigg, A.N., Indivero, J.L. (2020) Quantifying drivers of methane hydrobiogeochemistry in a tidal river floodplain. Goldschmidt Conference. Honolulu, HI. 6/21/20
125. Indivero, J.L., Borde, A.B., Myers-Pigg, A.N., Sengupta, A., Yabusaki, S.B., Bailey, V.L., Wang, W., McDowell, N.G., Ward, N.D. (2020) Time scales of coastal floodplain vegetation response to restored tidal exchange and sea level rise. ESA Annual Meeting. Salt Lake City, UT. 8/3/20
124. Myers-Pigg, A., Ward, N.D., Tagestad, J.D., Stegen, J.C., Butman, D., Bailey, V.L., Geffen, C.A. (2020, oral) Networking solutions to data-model coupling at the land-sea interface. Ocean Sciences Meeting. San Diego, CA. 2/18/20
123. Myers-Pigg, A., Ward, N.D., Indivero, J., Bailey, V.L. (2020) Seawater infiltration transforms porewater dissolved organic matter composition. AGU Fall Meeting. Virtual conference. 12/14/20
122. Norwood, M.J., Ward, N.D., Myers-Pigg, A., McDowell, N.G. (2020) Seawater exposure increases tree methane emissions. AGU Fall Meeting. Virtual conference. 12/14/20
121. Regier, P., Myers-Pigg, A., Norwood, M., Indivero, J., Wiese Moore, C., Ward, N.D. (2020) Oxygen dynamics shift with changes in lateral connectivity between a tidal creek and its floodplain. AGU Fall Meeting. Virtual conference. 12/14/20
120. Richey, J.E., Ward, N.D., Martinelli, L.A. (2020) Has there been a detectable trend in the biogeochemical signals of the lower Amazon River over the last 40 years? AGU Fall Meeting. Virtual conference. 12/14/20
119. Ward, N.D., Norwood, M., Myers-Pigg, A., Indivero, J., Wang, W., Pennington, S., Yabusaki, S., Bond-Lamberty, B., McDowell, N., Bailey, V. (2020, poster) Pathways for methane transport and atmospheric exchange in a coastal floodplain system. Ocean Sciences Meeting. San Diego, CA. 2/18/20
118. Ward, N.D., Norwood, M., Wang, W., Bond-Lamberty, B., McDowell, N., Musyimi, M., Regier, P. (2020, poster) A new approach for estimating and modeling tree methane emissions. AGU Fall Meeting. Virtual conference. 12/11/20
117. Bailey, V., Sengupta, A., Bond-Lamberty, B., McDowell, N., Megonigal, P., Stegen, J., Tan, Z., Ward, N.D., Yabusaki, S., Zheng, J. (2019, oral) Salinity and Inundation are Compounding Disturbances to Biogeochemical Fluxes in Coastal Forests. Biennial Meeting of the Soil Ecology Society. Toledo, OH. 5/28/19
116. Bond-Lamberty, B., Bailey, V., McDowell, N., Pennington, S., Sengupta, A., Stegen, J., Wang, W., Ward, N.D., Yabusaki, S. (2019, oral) Coastal forests and soils under stress: PREMIS at SERC. 6th Global Change Research Wetland (GCRew) Symposium. Edgewater, MD. 3/28/19
115. Bond-Lamberty, B., Pennington, S., Megonigal, P., Ward, N.D., Raczka, N., Brzostek, E., Bailey, V. (2019, poster) How will salinity and soil moisture changes affect coastal forests? A soil transplant experiment. AGU Fall Meeting. San Francisco, CA. 12/13/19
114. Borde, A., Gaeckle, J., Thom, R., Vavrinec, J., Buenau, K., Southard, S., Aston, L., Hall, K., Diefenderfer, H., Ward, N.D. (2019, oral) Eelgrass in the Salish Sea: Status, Restoration, and Research. Environmental Protection Agency facility tour. Sequim, WA. 4/29/19
113. Bianchi, T.S., Butman, D., Ward, N.D., Shields, M., Arntzen, E., Stegen, J., Indivero, J., Farris, Y., Rivas-Ubach, A., Tolic, N., Chu, R. (2019, poster) The Influence of Microbial Priming Effects on the Hydro-bio-geochemistry in the Columbia River and its Tributary Confluences. DOE Earth System Science PI Meeting. Potomac, MD. 4/30/19
112. Brewer, P., Taylor, B., Ward, N.D., Sengupta, A., Chen, H., Zheng, J., Megonigal, J.P. (2019, poster) Microbial processes in the stem wood of living trees affects greenhouse gas production and nutrient cycling. AGU Fall Meeting. San Francisco, CA. 12/12/19

111. Coppola, A., Viviroli, D., Seidel, M., Haghypour, N., Nascimento, G.S., Jones, M., Ward, N.D., Richey, J.E., Schmidt, M.W.I., Eglinton, T.I., Dittmar, T., Abiven, S. (2019, oral) Dynamic behavior of dissolved black carbon in the Amazon River. EGU General Assembly. Vienna, Austria. 4/9/19
110. Coppola, A., Seidel, M., Ward, N.D., Viviroli, D., Haghypour, N., Nascimento, G.S., Abiven, S., Jones, M., Richey, J.E., Eglinton, T.I., Dittmar, T., Schmidt, M.W.I. (2019, poster) Marked isotopic variability within and between the Amazon River and marine dissolved black carbon pools. AGU Fall Meeting. San Francisco, CA. 12/12/19
109. Ghosh, R., Ball, T., Freeman, M., Shooltz, D., Fackerus, N., Gill, G., Kuo, L.J., Indivero, J., Ward, N.D. (2019, poster) Probing Biogeochemical Processes in Coastal Ecosystems with High-Resolution/Long-term Dissolved Oxygen Measurements. DOE Earth System Science PI Meeting. Potomac, MD. 4/30/19
108. Ghosh, R., Ball, T., Freeman, M., Loloee, R., McIntire, C., Shooltz, D., Gill, G., Kuo, Myers-Pigg, A., Ward, N.D. (2019, poster) Groundwater Oxygen Pulses within a Coastal Watershed: A Potential Driver of Hot Moments in the Carbon Cycle. AGU Fall Meeting. San Francisco, CA. 12/13/19
107. Krygowski, K., Norwood, M., Ward, N.D. (2019, oral) Preliminary look at CO₂ and CH₄ biogeochemical cycling in a Pacific Northwest upland temperate forest. Department of Energy Science Undergraduate Laboratory Internships (SULI) Symposium. Sequim, WA. 5/3/19
106. Landoni, K., Myers-Pigg, A., Ward, N.D. (2019, oral) Characterizing colored dissolved organic matter to understand quality and sources of carbon at Beaver Creek, WA.. Department of Energy Science Undergraduate Laboratory Internships (SULI) Symposium. Sequim, WA. 8/22/19
105. Morrison, E., Bianchi, T.S., Liu, Y., Rivas-Ubach, A., Ward, N.D., Y., Osborne, T.Z. (2019, poster) Do priming effects influence microbial turnover of blue carbon in the coastal zone? Gordon Research Conference: Chemical Oceanography. Holderness, N.H. 7/15/19
104. Morrison, E., Bianchi, T.S., Liu, Y., Rivas-Ubach, A., Ward, N.D., Y., Osborne, T.Z. (2019, oral) A multi-omics approach to understand the molecular and microbial transformations associated with dissolved organic matter turnover in coastal waters. AGU Fall Meeting. San Francisco, CA. 12/12/19
103. Myers-Pigg, A., Ward, N.D., Yabusaki, S., Sengupta, A., Indivero, J., Telfeyan, K., Rowland, J., Piliouras, A., Newman, B., Bailey, V. (2019, oral) Connectivity goes both ways: Implications for the effects of seawater infiltration on terrestrial-aquatic linkages and biogeochemical cycling. AGU Fall Meeting. San Francisco, CA. 12/12/19
102. Sengupta, A., Bond-Lamberty, B., Rivas-Ubach, A., Handakumbura, P., Yabusaki, S., Bailey, V., Stegen, J., Ward, N.D. (2019, oral) Short-term periodic seawater inundations impact carbon chemistry, metabolic profile, and gas flux signatures of soil cores from a coastal forested floodplain. AGU Fall Meeting. San Francisco, CA. 12/12/19
101. Shields, M., Bianchi, T.S., Butman, D., Ward, N.D., Arntzen, E., Stegen, J., Indivero, J., Farris, Y., Rivas-Ubach, A., Tolic, N., Chu, R. (2019, poster) The Hydro-bio-geochemistry of the Columbia River and its Tributary Confluences. AGU Fall Meeting. San Francisco, CA. 12/9/19
100. Stegen, J.C., Ward, N.D., Butman, D., Tagestad, J., (2019, poster) Small streams dominate US tidal reaches and will be disproportionately impacted by sea-level rise. AGU Fall Meeting. San Francisco, CA. 12/13/19
99. Valerio, A.M., Kampel, M., Vantrepotte, V., Ward, N.D., Sawakuchi, H.O., Less, D.F., Neu, V., Cunha, A., Richey, J.E. (2019, poster) Algoritmo regional para estimativa do material particulado suspensão no baixo Amazonas. Brazilian Symposium on Remote Sensing XIX. Santos, SP. 4/14/19

98. Ward, N.D. (2019, poster) Integrative Earth System Science Across the Terrestrial-Aquatic Interface: A Grand Challenge for the 21st Century. Scientist & Engineer Development Program Graduation Ceremony. Richland, WA. 6/18/19
97. Ward, N.D., Indivero, J., Yabusaki, S., McDowell, N., Wang, W., Stegen, J., Bond-Lamberty, B., Sengupta, A., Pennington, S., Zhang, P., Gunn, C., Myers-Pigg, A., Norwood, M., Bailey, V. (2019, oral) Above and belowground biogeochemical linkages along a salt-impacted coastal terrestrial-aquatic interface in the Pacific Northwest, USA. ASLO Aquatic Sciences Meeting. San Juan, PR. 2/28/19
96. Ward, N.D., Myers-Pigg, A., Norwood, M., Indivero, J., Wang, W., Yabusaki, S., McDowell, N., Bailey, V. (2019, poster) "Short-circuits" in the methane balance of a coastal floodplain and tidal river—flood events and tree stems. Gordon Research Conference: Chemical Oceanography. Holderness, N.H. 7/15/19
95. Ward, N.D., Norwood, M., Myers-Pigg, A., Indivero, J., Wang, W., Pennington, S., Yabusaki, S., Bond-Lamberty, B., McDowell, N., Bailey, V. (2019, poster) Coastal flooding events and belowground transport tip the methane balance of a first-order watershed in the Pacific Northwest. AGU Fall Meeting. San Francisco, CA. 12/12/19
94. Yabusaki, S.B., Ward, N.D., Waichler, S.R., Myers-Pigg, A., Sengupta, A., Norwood, M., Zheng, J., Fang, Y., Chen, X., Duan, Z., Serkowski, J., Bailey, V. (2019, poster) Modeling methane transport and transformation in a first-order tidal river floodplain. AGU Fall Meeting. San Francisco, CA. 12/9/19
93. Zayas-Santiago, C., Rivas-Ubach, Ward, N.D., Kuo, L.J., Zimmerman, R. (2019, oral) Metabolomics reveal biochemical pathways responsible for eelgrass response to climate change. ASLO Aquatic Sciences Meeting. San Juan, P.R. 2/27/19
92. Zhang, H., McDowell, N.G., Wang, W., Zhang, P., Pivovarov, A., Ward, N.D., Guan, D., Wang, A., Leff, R., Abend, J., Bailey, V. (2019, poster) Seawater exposure impacts plant hydraulics and gas exchange and increases mortality of *Picea sitchensis* trees in the Pacific Northwest, USA. Ecological Society of America Annual Meeting. Louisville, KY. 8/12/19
91. Zhang, P., McDowell, N.G., Wang, W., Pivovarov, A., Leff, R., Zhang, H., Chow, S., Ward, N.D., Indivero, J., Zhou, X., Bailey, V. (2019, poster) Declining carbohydrate contents of Sitka-spruce trees exposed to seawater. Ecological Society of America Annual Meeting. Louisville, KY. 8/12/19
90. Arellano, A.R., Bianchi, T.S., Osburn, C.L., D'Sa, E.J., Oviedo-Vargas, D., Ward, N.D., Joshi, I., Ko, D., Shields, M.R., Kurian, G., Green, J. (2018, poster) Mechanisms of blue carbon export in blackwater river-dominated and particle-dominated estuaries. AGU Fall Meeting. Washington, D.C. 12/13/18
89. Bailey, V., Bond-Lamberty, B., McDowell, N., Megonigal, P., Stegen, J., Ward, N.D., Yabusaki, S. (2018, oral) Soil, water, and plants: Salinity and inundation influence biogeochemical fluxes through coastal forests. AGU Fall Meeting. Washington, D.C. 12/11/18
88. Bond-Lamberty, B., Pennington, S., Ward, N.D. (2018, poster) Understanding soil moisture and salinity effects on greenhouse gas fluxes from coastal soils. AGU Fall Meeting. Washington, D.C.
87. Cook, T.B., Ward, N.D., Indivero, J., Gunn, C.M. (2018, oral) Soil respiration rates along fresh-to-saline porewater gradients in six Pacific Northwest coastal watersheds. Department of Energy Science Undergraduate Laboratory Internships (SULI) Symposium. Sequim, WA. 8/16/18
86. Cando, S., Ward, N.D., Borde, A., Vavrinc, J., Pelly, A. (2018, oral) Temperature's effect on primary productivity of regional eelgrass (*Zostera marina* L.) populations in the Salish Sea. Department of Energy Science Undergraduate Laboratory Internships (SULI) Symposium. Sequim, WA. 8/16/18

85. Indivero, J., Ward, N.D., Gunn, C., Wang, W., McDowell, N.G. (2018, poster) Elevated greenhouse gas concentrations in coastal forest tree stems in the Pacific Northwest. Feiro Marine Life Center Celebration of Science & Technology. Sequim, WA. 4/28/18
84. Indivero, J., Ward, N.D., Gunn, C., Wang, W., McDowell, N.G. (2018, poster) Elevated greenhouse gas concentrations in coastal forest tree stems in the Pacific Northwest. Department of Energy Science Undergraduate Laboratory Internships (SULI) Symposium. Sequim, WA. 5/1/18
83. Kuhn, C., Valerio, A., Ward, N.D., Loken, L., Sawakuchi, H.O., Kampel, M., Richey, J.E., Stadler, P., Crawford, J., Striegl, R.G., Vermote, E., Pahlevan, N. Butman, D. (2018, poster) Assessment of atmospheric correction methods for Landsat-8 and Sentinel-2 over large rivers. Ocean Optics XXIV. Dubrovnik, Croatia. 10/10/18
82. Morrison, E., Bianchi, T.S., Ward, N.D., Rivas-Ubach, A., Liu, Y., Osborne, T.Z. (2018, poster) Does microbial priming influence the turnover of blue carbon in aquatic systems? AGU Fall Meeting Meeting. Washington, D.C. 12/10/18
81. Osburn, C.L., Joshi, I., Oveido-Vargas, D., Bianchi, T.S., D'Sa, E.J., Ko, D., Arellano, A., Shields, M.R., Ward, N.D. (2018) Higher rates of sea level rise result in higher lateral flux of dissolved organic carbon (DOC) from tidal wetlands to coastal waters of the northern Gulf of Mexico. AGU Fall Meeting. Washington, D.C. 12/14/18
80. Sawakuchi, H.O., Ward, N.D., Bastviken, D., Moreira, M.Z., Camargo, P.B., Neu, V., Valerio, A.M., Cunha, A.C., Less, D.F.S., Diniz, J.E.M., Brito, D., Richey, J.E. (2018, oral) The role of methane oxidation in the carbon cycle of the lower Amazon River. EGU General Assembly. Vienna, Austria. 4/11/2018
79. Schafer, T., Ward, N.D., Julian, P., Reddy, K.R., Osborne, T.Z. (2018, poster) Effects of Hurricane Irma on water quality and dissolved organic carbon concentrations across Pellicer Creek. Guana Tolomato Matanzas National Estuarine Research Reserve State of the Reserve Symposium. St. Augustine, FL. 2/23/18
78. Schafer, T., Ward, N.D., Reddy, K.R., Osborne, T.Z. (2018, poster) Hurricane Irma: Effects on dissolved organic carbon concentrations and water quality parameters. North Florida Marine Science Symposium. St. Augustine, FL. 1/25/18
77. Schafer, T., Ward, N.D., Reddy, K.R., Osborne, T.Z. (2018) Effects of seasonality and hurricane events on Water Quality and DOM cycling along a salinity gradient in Florida. Society of Wetland Scientists Annual Meeting. Denver, CO. 5/30/18
76. Schafer, T., Ward, N.D., Julian, P., Reddy, K.R., Osborne, T.Z. (2018, oral) Effects of Hurricane Irma on water quality and DOM cycling along a salinity gradient in North Florida. ASLO Summer Meeting. Victoria, BC. 6/14/18
75. Sengupta, A., Gunn, C., Indivero, J., Toyoda, J., Tfaily, M., Chu, R., Stegen, J., Bailey, V., Ward, N.D. (2018, poster) Subsurface carbon signatures in a coastal watershed experiencing tidal inundation. AGU Fall Meeting. Washington, D.C. 12/11/18
74. Valerio, A.M., Kampel, M., Vantrepotte, V., Ward, N.D., Sawakuchi, H.O., Neu, V., Less, D., Cunha, A.C., Richey, J.E. (2018) Assessment of absorption coefficients at the lower Amazon River region. International Society for Optics and Photonics (SPIE) Asia-Pacific Remote Sensing. Honolulu, HI. 9/24/18
73. Ward, N.D. and Indivero, J. (2018, poster) High-resolution biogeochemical monitoring along three types of coastal interface ecosystems in the Pacific Northwest. Goldschmidt Conference. Boston, MA. 8/15/18

72. Ward, N.D., Joshi, I., Valerio, A.M., D'Sa, E.J., Osburn, C.L., Bianchi, T.S., Ko, D., Oviedo-Vargas, D., Arellano, A.R., Sawakuchi, H.O., Cunha, A.C., Richey, J.E., Yager, P.L., Kampel, M. (2018, oral) Remote sensing of carbon dioxide fluxes in coastal ecosystems across scales. ASLO Ocean Sciences Meeting. Portland, OR. 2/15/18
71. Ward, N.D., Rivas-Ubach, A., Kuo, L.-J., Liu, Y., Hill, V.J., Zayaz-Santiago, C., Zimmerman, R. (2018, oral) Evaluating the impacts of ocean carbonation on the metabolic function of eelgrass *Zostera marina* using a metabolomics-based approach. ASLO Summer Meeting. Victoria, BC. 6/12/18
70. Ward, N.D., Indivero, J., Gunn, C., Cook, T., Wang, W., McDowell, N.G. (2018, poster) Coastal forest greenhouse gas levels in tree stems and porewaters around the Pacific Northwest. AGU Fall Meeting. Washington, D.C. 12/10/18
69. Ward, N.D., Gunn, C., Indivero, J. (2018, poster) ECO-Citizens: Improving Aquatic Datasets while Inspiring Citizen Scientists. AGU Fall Meeting. Washington, D.C. 12/14/18
68. Yabusaki, S.B., Ward, N.D., Fang, Y., Waichler, S.R., Duan, Z., Sengupta, A., Indivero, J. (2018, poster) Salinity enhancement in a tidal river floodplain. AGU Fall Meeting. Washington, D.C. 12/11/18
67. Arellano, A.R., Bianchi, T.S., Osburn, C.L., Ward, N.D., D'Sa, E.J., Joshi, I., Oviedo-Vargas, D., Ko, D. (2017, poster) Physical factors controlling carbon cycling dynamics in blackwater river-dominated and particle-dominated estuaries. AGU Fall Meeting. New Orleans, LA. 12/14/15
66. Indivero, J.L., Ward, N.D. (2017, oral) Ecosystem metabolism dynamics across the terrestrial-aquatic interface in Sequim Bay, WA. Department of Energy Science Undergraduate Laboratory Internships (SULI) Symposium. Richland, WA. 12/14/17
65. Kuhn, C., Richey, J.E., Striegl, R.G., Ward, N.D., Sawakuchi, H.O., Crawford, J., Loken, L., Stadler, P., Dornblaser, M., Butman, D. (2017, poster) Optical remote sensing algorithm validation using high-frequency underway biogeochemical measurements in three large global river systems. AGU Fall Meeting. New Orleans, LA. 12/13/17
64. Less, D.F.S., Neu, V., Valerio, A.M., Ward, N.D., Cunha, A.C., Sawakuchi, H.O., Brito, D.C., Richey, J.E. (2017) Rainfall and temperature influence on pCO₂ at the Amazon River mouth. XVI Congresso Brasileiro de Limnologia. Rio de Janeiro, BR. 7/25/17
63. Liu, Y., Bianchi, T.S., Arellano, A.R., Ward, N.D., Tolic, N., Pasa-Tolic, L., Kuo, L.J. (2017, oral) Molecular signature of organic carbon along a salinity gradient in the Suwannee River plume. ASLO Aquatic Sciences Meeting. Honolulu, HI. 3/2/17
62. Morrison, E., Ward, N.D., Bianchi, T.S., Liu, Y., Arellano, A., Ogram, A., Osborne, T.Z. (2017, poster). The role of priming effects on the conversion of blue carbon to CO₂ in the coastal zone. DOE Joint Genome Institute Genomics of Energy & Environment Meeting. Walnut Creek, CA. 3/20/17
61. Morrison, E., Ward, N.D., Arellano, A., Ogram, A., Osborne, T.Z., Vaughn, D., Liu, Y., Rivas-Ubach, A., Bianchi, T.S. (2017). The role of priming effects on the conversion of blue carbon to CO₂ in the coastal zone. AGU Fall Meeting. New Orleans, LA. 12/14/17
60. Osborne, T.Z., Simpson, L., Schafer, T., Julian, P., Ward, N.D. (2017, oral). Climate induced acceleration of carbon and nutrient cycling in a saltmarsh-mangrove ecotone. Society of Wetland Scientists Annual Meeting. San Juan, Puerto Rico. 6/7/17
59. Osburn, C.L., Joshi, I., Lebrasse, C., Oviedo-Vargas, D., Bianchi, T.S., Bohnenstiehl, D.R., D'Sa, E.J., He, R., Ko, D., Arellano, A., Ward, N.D. (2017) Small and large scale exchanges of dissolved organic carbon (DOC) between tidal wetlands and their adjacent coastal waters. AGU Fall Meeting. New Orleans, LA. 12/15/17

58. Osburn, C.L., Bianchi, T.S., D'Sa, E.J., Ko, D., Oveido-Vargas, D., Arellano, A., Joshi, I., Ward, N.D. (2017) Linking carbon exchange between coastal wetland and shelf environments. Joint NACP and Ameriflux Principal Investigators Meeting. North Bethesda, MD. 3/27/17
57. Osburn, C.L., Joshi, I., Lebrasse, C., Oveido-Vargas, D., Bianchi, T.S., Bohnenstiehl, D.R., D'Sa, E.J., He, R., Ko, D., Arellano, A., Ward, N.D. (2017) Quantifying dissolved organic carbon exchanges between coastal wetland and shelf environments. Coastal & Estuarine Research Federation. Providence, RI. 11/5/2017
56. Valerio, A.M., Kampel, M., Vantrepotte, Ward, N.D., V., Sawakuchi, H.O., Silva, D.F., Diniz, J.E.M., Neu, V., Gagne-Maynard, W., Cunha, A.C., Krusche, A.V., Richey, J.E. (2017) Assessment if remote sensing empirical algorithms to retrieve colored dissolved organic matter in the lower Amazon River. Brazilian Symposium on Remote Sensing. Santos, BR.
55. Ward, N.D., Bianchi, T.S., Liu, Y., Arellano, A., Vaughn, D., Morrison, E., Osborne, T.Z., Ogram, A. (2017, oral) The role of priming effects on the conversion of blue carbon to CO₂ in the coastal zone. Society of Wetland Scientists Annual Meeting. San Juan, Puerto Rico. 6/7/17
54. Ward, N.D., Bianchi, T.S., Liu, Y., Rivas-Ubach, A., Arellano, A., Vaughn, D., Morrison, E., Osborne, T.Z., Ogram, A. (2017, poster) The role of priming effects on the conversion of blue carbon to CO₂ in the coastal zone. PNNL Earth and Biological Sciences Directorate Advisory Committee Review. Richland, WA. 6/14/17
53. Ward, N.D., Sawakuchi, H.O., Gagne-Maynard, W., Cunha, A.C., Brito, D.C., Neu, V., da Silva, D.F., Diniz, J.E.M. Valerio, A.M., da Silva, R., Bianchi, T.S., Krusche, A.V., Richey, J.E., Keil, R.G. (2017, oral) A revised perspective on the contribution of microbial respiration to carbon dioxide outgassing in the Amazon River based on new incubation methods. ASLO Aquatic Sciences Meeting. Honolulu, HI. 3/1/17
52. Ward, N.D., Sawakuchi, H.O., Neu, V., Valerio, A., Less, D., Guedes, V., Wood, J., Brito, D., Cunha, A., Kampel, M., Richey, J.E. (2017, oral) The influence of tides on biogeochemical dynamics at the mouth of the Amazon River. AGU Fall Meeting. New Orleans, LA. 12/15/17
51. Ward, N.D., Osborne, T.Z., Dye, T., Julian, P. (2017, oral and poster) Examining the effects of hurricanes Matthew and Irma on water quality in the intracoastal waterway, St. Augustine, FL. AGU Fall Meeting. New Orleans, LA. 12/12/17
50. Arellano, A.R., Bianchi, T.S., Osburn, C.L., Ward, N.D., D'Sa, E.J., Joshi, I., Oveido-Vargas, D., Ko, D. (2016, poster) Assessing bulk carbon and biomarkers in two contrasting bays: blackwater river dominated and particle dominated. Ocean Sciences Meeting. New Orleans, LA. 2/26/16
49. Arellano, A.R., Bianchi, T.S., Osburn, C.L., Ward, N.D., D'Sa, E.J., Joshi, I., Oveido-Vargas, D., Ko, D. (2016, poster) Assessing bulk carbon and biomarkers in two contrasting bays: blackwater river dominated and particle dominated. N. Florida Marine Science Symposium. Cedar Key, FL. 1/28/16
48. Arellano, A.R., Bianchi, T.S., Osburn, C.L., Ward, N.D., D'Sa, E.J., Joshi, I., Oveido-Vargas, D., Ko, D. (2016, poster) Differences in the temporal variability of particulate and dissolved organic carbon (POC and DOC) in blackwater river-dominated and particle-dominated estuaries. AGU Fall Meeting. San Francisco, CA. 12/12/16
47. Bianchi, T.S., Raymond, P., Butman, D., Kates, R., Flessa, K.W., Zamora, H., Ward, N.D. (2016, oral) Flooding of a Major Dry Waterway: Impacts of Flow Restoration on River-Carbon Composition and Fluxes in the Colorado River. Ocean Sciences Meeting. New Orleans, LA. 2/25/16
46. Bianchi, T.S., Raymond, P., Butman, D., Kates, R., Flessa, K.W., Zamora, H., Ward, N.D. (2016, oral) Flooding of a Major Dry Waterway: Impacts of Flow Restoration on River-Carbon

- Composition and Fluxes in the Colorado River. Goldschmidt Conference. Yokohama, JP. 6/26/16
45. D'Sa, E.J., Joshi, I., Osburn, C.L., Bianchi, T.S., Ko, D., Oviedo-Vargas, D., Kinsey, Arellano, A., Ward, N.D. (2016, poster) Contrasting optical properties of suspended particulate matter in the Northern Gulf of Mexico bays. NASA Ocean Color Research Team Meeting. Silver Springs, MD. 4/18/16
 44. Joshi, I., D'Sa, E.J., Osburn, C.L., Bianchi, T.S., Ko, D., Oviedo-Vargas, D., Kinsey, J.D., Arellano, A., Ward, N.D. (2016, poster) Assessing CDOM from VIIRS satellite ocean color data in an estuarine environment – initial results from Apalachicola Bay. Ocean Sciences Meeting. New Orleans, LA. 2/26/16
 43. Joshi, I., D'Sa, E.J., Osburn, C.L., Bianchi, T.S., Ko, D., Oviedo-Vargas, D., Kinsey, J.D., Arellano, A., Ward, N.D. (2016, poster) Seasonal estimates of DOC standing stocks in the semi-enclosed Apalachicola Bay estuary: Towards a better understanding using field, ocean color, and model data. AGU Fall Meeting. San Francisco, CA. 12/12/16
 42. Kates, R., Bianchi, T.S., Raymond, P., Butman, D., Ward, N.D., Flessa, K.W., Zamora, H. (2016, poster) Flooding of a Major Dry Waterway: Impacts of Flow Restoration on River-Carbon Composition and Fluxes in the Colorado River. N. Florida Marine Science Symposium. Cedar Key, FL. 1/28/16
 41. Ko, D., Bianchi, T.S., Osburn, C.L., D'Sa, E.J., Ward, N.D., Joshi, I., Arellano, A., Oviedo-Vargas, D. (2016, poster) Study of circulation in the Apalachicola Bay and the surrounding wetland applying triple-nested models downscaling from global ocean to estuary. Ocean Sciences Meeting. New Orleans, LA. 2/25/16
 40. Liu, Y., Bianchi, T.S., Arellano, A.R., Ward, N.D., Tolic, N., Kuo, L.J. (2016, oral) Molecular signature of organic carbon along a salinity gradient in the Suwannee River plume. AGU Fall Meeting. San Francisco, CA. 12/13/16
 39. Osborne, T.Z., Simpson, L.T., Schafer, T.B., Camacho, M., Lane, F., Julian, P., Ward, N.D. (2016, oral) Carbon biogeochemical processes along a mangrove-saltmarsh ecotone. Mangrove and Macrobenthos Meeting. St. Augustine, FL. 7/20/16
 38. Oviedo-Vargas, D., Osburn, C.L., Bianchi, T.S., D'Sa, E. J., Ko, D., Ward, N.D., Arellano, A., Joshi, I., Kinsey, J.D. (2016, poster) Examining the relative contribution of 'blue carbon' to coastal shelf environments via optical properties of dissolved and base-extracted particulate organic matter. Ocean Sciences Meeting. New Orleans, LA. 2/26/16
 37. Sawakuchi, H.O., Bertassoli, D., Silveira, Á., Bozi, B., Jesus, J.D., Sawakuchi, A.O., Ward, N.D., Bastviken, D., Krusche, A.V., Richey, J.E. (2016, poster) Methane and carbon dioxide production in soils flooded by the Belo Monte hydropower reservoir in the Amazon Basin, Brazil. AGU Fall Meeting. San Francisco, CA. 12/13/16
 36. Seidel, M., Dittmar, T., Ward, N.D., Krusche, A.V., Richey, J.E., Yager, P.L., Medeiros, P.M. (2016, oral) Molecular transformations of dissolved organic matter in the Lower Amazon River. Ocean Sciences Meeting. New Orleans, LA. 2/25/16
 35. Ward, N.D. (2016, oral) Net ecosystem exchange of the Amazon River-to-ocean continuum. Whitney Laboratory for Marine Bioscience. St. Augustine, FL. 8/15/16
 34. Ward, N.D., Sawakuchi, H.O., Gagne-Maynard, W., Cunha, A.C., Brito, D.C., Neu, V., da Silva, D.F., Diniz, J.E.M. Valerio, A.M., da Silva, R., Bianchi, T.S., Krusche, A.V., Richey, J.E., Keil, R.G. (2016, poster) Hydrodynamic and biogeochemical controls and CO₂ production along the lower Amazon River. Gordon Research Conference: Organic Geochemistry. Holderness, NH. 7/27/16

33. Ward, N.D., Bianchi, T.S., Osburn, C., D'Sa, E.J., Ko, D, Joshi, I., Arellano, A., Kinsey, J., Oveido-Vargas, D. (2016, poster) Methane and carbon dioxide exchange in two Gulf of Mexico coastal wetland environments. Ocean Sciences Meeting. New Orleans, LA. 2/21/16.
32. Ward, N.D., Bianchi, T.S., Cohen, M., Martin, J.B., Quintero, C.J., Osborne, T.Z., Sawakuchi, H.O. (2016, poster) Methane evasion and oxidation in the Big Cypress National Preserve—a low relief carbonate wetland. AGU Fall Meeting. San Francisco, CA. 12/13/16
31. Ward, N.D., Bianchi, T.S., Sawakuchi, H.O., Gagne-Maynard, W., Cunha, A.C., Brito, D.C., Neu, V., Valerio, A.M., da Silva, R., Krusche, A.V., Richey, J.E., Keil, R.G. (2016, poster) The reactivity of plant-derived organic matter and the potential importance of priming effects in the lower Amazon River. N. Florida Marine Science Symposium. Cedar Key, FL. 1/28/16
30. Ward, N.D., Firme de Almeida, L., de Jesus, G.D., Gould, R., Tan, A., Bianchi, T.S., Krusche, A.V., Keil, R.G., Richey, J.E. (2016, poster) The response of sediments and dissolved organic matter to rapid rainfall in the Santa Maria da Vitoria Watershed, Espírito Santo. 17th Annual Soil and Water Sciences Research Forum. Gainesville, FL. 9/15/16
29. Bianchi, T.S., Ward, N.D., Thornton, D., Yvon-Lewis, S., King, G., Eglinton, T., Shields, M., Curtis, J. (2015, oral) Priming of terrestrially-derived dissolved organic carbon: a laboratory and field based “Proof of Concept.” Goldschmidt Conference. Prague, CZ. 8/18/15
28. Bianchi, T.S., Ward, N.D., Thornton, D., Yvon-Lewis, S., King, G., Eglinton, T., Shields, M., Curtis, J. (2015, poster) Priming of terrestrially-derived dissolved organic carbon: Implications for coastal carbon cycling. AGU Joint Assembly. Montreal, CAN. 5/5/15
27. Cohen, M., Quintero, C.J., Ward, N.D., Raines, E., Brown, A.L., Martin, J.B., Bianchi, T.S., McLaughlin, D., Osborne, T.Z. (2015, oral) An Ecological Drill: Biogeomorphic Pattern Evolution in a Low-Relief Carbonate Landscape. AGU Fall Meeting. San Francisco, CA. 12/16/16
26. Gagne-Maynard, W., Ward, N.D., Sawakuchi, H.O., Neu, V., Cunha, A.C., da Silva, R., Brito, D.C., de Matos, A., Keil, R.G., Krusche, A.V., Richey, J.E. (2015, abstract) Spatial and Temporal Variability of pCO₂, 13C-CO₂, and O₂ in the tidal Amazon River. AGU Fall Meeting. San Francisco, CA. 12/14/15
25. Osburn, C.L., Bianchi, T.S., D'Sa, E.J., Ko, D., Ward, N.D., Tait, Z.S., and Joshi, I. (2015, poster) Linking carbon exchange between coastal wetland and shelf environments. NASA Carbon Cycle & Ecoststems Joint Science Workshop. Hyattsville, MD. 4/20/15
24. Ward, N.D. and Petrik-Finley, R.J. (2015, poster) Integrating local environmental research into K-12 science classrooms and the value of graduate student-educator partnerships. AGU Fall Meeting. San Francisco, CA. 12/18/15
23. Ward, N.D., Firme de Almeida, L., de Jesus, G.D., Gould, R., Tan, A., Bianchi, T.S., Krusche, A.V., Keil, R.G., Richey, J.E. (2015, poster) The response of sediments and dissolved organic matter to rapid rainfall in the Santa Maria da Vitoria Watershed, Espírito Santo. AGU Fall Meeting. San Francisco, CA. 12/14/15
22. Ward, N.D. (2015, oral) Biogeochemical dynamics across environmental gradients. UF Geological Sciences Seminar. Gainesville, FL. 9/10/15
21. Gagne-Maynard, W., Ward, N.D., Sawakuchi, H.O., Neu, V., Cunha, A.C., da Silva, R., Brito, D.C., de Matos, A., Keil, R.G., Krusche, A.V., Richey, J.E. (2014, poster) Spatial Patterns of In-Situ Production and Respiration within a Turbid Tropical River: Implications for Amazonian Carbon Cycling. AGU Fall Meeting. San Francisco, CA. 12/15/16
20. Sawakuchi, H.O., Bastviken, D., Sawakuchi, A.O., Borges, C., Tsai, S.M., Ward, N.D., Richey, J.E., Ballester, M.V.R., Krusche, A.V. (2014, poster) Methane dynamics in large Amazonian rivers. AGU Fall Meeting. San Francisco, CA. 12/15/16

19. Seidel, M., Ward, N.D., Yager, P.L., Carpenter, E.J., Gomes, H.R., Krusche, A.V., Richey, J.E., Dittmar, T., Medeiros, P.M. (2014, oral) Biogeochemistry of dissolved organic matter in the river to ocean continuum of the Amazon. Ocean Sciences Meeting. Honolulu, HI. 2/24/14
18. Seidel, M., Ward, N.D., Yager, P.L., Krusche, A.V., Richey, J., Dittmar, T., Medeiros, P.M. (2014, oral) The influence of the Amazon River on the biogeochemistry of dissolved organic matter in the tropical North Atlantic Ocean. 1st Southeastern Biogeochemistry Symposium. Atlanta, GA. 4/5/16
17. Ward, N.D. (2014, oral) Biogeochemical dynamics across the land-ocean-atmosphere continuum. UF Geological Sciences Seminar. Gainesville, FL. 9/18/14
16. Ward, N.D. (2014, oral) Ecosystem dynamics of the land-ocean-atmosphere continuum. UW Chemical Oceanography Seminar. Seattle, WA. 3/7/14
15. Ward, N.D. (2014, oral) A multi-scale assessment of aquatic ecosystem processes across the land-ocean-atmosphere continuum. UW Oceanography PhD Defense. Seattle, WA. 5/16/14
14. Ward, N.D., Keil, R.G., Medeiros, P.M., Brito, D.C., Cunha, A.C., Moura, J.M.S., Sawakuchi, H.O., Yager, P.L., Krusche, A.V., Richey, J.E. (2014, oral) The evolution of organic matter along the lower Amazon River continuum-Óbidos to the ocean. Ocean Sciences Meeting. Honolulu, HI. 2/24/14
13. Ward, N.D., Keil, R.G., Moura, J.M.S., Brito, D.C., Cunha, A.C., Medeiros, P.M., Crump, B., Yager, P.L., Krusche, A.V., Richey, J.E. (2014, abstract) Material fluxes from the mouth of the Amazon River and the dynamics of organic matter degradation from Óbidos to the ocean. Big Rivers Conference. Manaus, BR. 7/21/14
12. Ward, N.D., Keil, R.G., Medeiros, P.M., Brito, D.C., Cunha, A.C., Moura, J.M.S., Sawakuchi, H.O., Yager, P.L., Krusche, A.V., Richey, J.E. (2013, poster) The evolution of organic matter along the lower Amazon River continuum. AGU Fall Meeting. San Francisco, CA. 12/13/13
11. Crump, B.C., Doherty, M., Fortunato, C.S., Simon, H.M., Smith, M.W., Krusche, A.V., Brito, D., Cunha, A.C., Fernandes, M., Zielinski, B., Paul, J.H., Ward, N.D., Richey, J.E., Satinsky, B.M., Sharma, S., Smith, C.B., Moran, M.A., Yager, P.L. (2012, poster) Microbial community composition and metagenomes across the river-to-ocean continuum of the Columbia and Amazon Rivers. ISME Symposium. Copenhagen, DK. 8/19/12
10. Medeiros, P.M., Ward, N.D., Niggeman, J., Yager, P.L., Krusche, A.V., Dittmar, T. (2012, poster) Tracking the fate of dissolved organic matter in the Amazon River to ocean continuum. Ocean Sciences Meeting. Salt Lake City, UT. 2/19/12
9. Ward, N.D., Keil, R.G., Medeiros, P.M., Brito, D.C., Krusche, A.V., Richey, J.E. (2012, oral) Compositional dynamics of dissolved lignin in watersheds. AGU Fall Meeting. San Francisco, CA. 12/4/12
8. Richey, J.E., Ward, N.D., Brito, D., daSilva, M., de Melo, D., Sousa Moura, J.M., Crump, B., Yager, P.L., Moran, M. (2011, poster) What happens in the last 900km of the Amazon (a first look)? AGU Fall Meeting. San Francisco, CA. 12/4/12
7. Ward, N.D., Keil, R.G., Medeiros, P.M., Richey, J.E. (2011, oral) Organic fuels for respiration in tropical river systems. AGU Fall Meeting. San Francisco, CA. 12/6/11
6. Ward, N.D. (2010, oral) Temporal variation in river nutrient and dissolved lignin phenol concentrations and the impact of storm events on nutrient loading to Hood Canal, WA. UW Oceanography Masters Defense. Seattle, WA. 5/20/10
5. Ward, N.D., Keil, R.G., Richey, J.E. (2010, conference paper) Temporal variation in river nutrient and dissolved lignin phenol concentrations and the impact of storm events on nutrient loading to Hood Canal, WA. CUAHSI 2nd Joint Federal Interagency conference. Las Vegas, NV. 2/16/10

4. Ward, N.D., Keil, R.G., Richey, J.E. (2009, poster) Impacts of storm events on nutrient loading to the lower Hood Canal region. UW Water Center Symposium. Seattle, WA. 2/12/19
3. Ward, N.D. and Aluwihare, L. (2008, oral) Gene expression under variable nutrient conditions in the diatom *T. pseudonana*. UCSD Undergraduate Research Conference. La Jolla, CA. 5/16/08
2. Ward, N.D. (2007, oral) Composition and fate of dissolved organic carbon in Arctic river runoff. WHOI NSF Summer Student Fellowship Symposium. Woods Hole, MA. 8/21/07
1. Ward, N.D. and Aluwihare, L. (2007, oral) Gene expression under variable nutrient conditions in the diatom *T. pseudonana*. UCSD Undergraduate Research Conference. La Jolla, CA. 5/18/07

Teaching Experience

- 2016 **Guest Speaker**, Girls Get It STEM Club, Indian Trails Middle School, Palm Coast, FL
- 2014-2016 **Guest Lecturer**, University of Florida, Gainesville, FL. Courses: (i) Estuarine Biogeochemistry (grad) and (ii) Organic Biomarkers (grad). Instructor: Thomas Bianchi
- 2012-2013 **NSF GK-12 Teaching Fellow**, Garfield High School, Seattle, WA. Courses: (i) Sophomore Ecology and (ii) AP Environmental Science. Instructor: Rachel J. Petrik-Finley
- 2009-2010 **Teaching Assistant**, University of Washington, Seattle, WA. Course: Puget Sound Ecosystem (undergrad). Instructors: John Lombard and Jeffrey Richey
- 2009 **Guest Instructor**, Montlake Elementary School, Seattle, WA. Course: Weekly K-1 Science Lessons. Instructor: Rachel Yorde
- 2006 **Teaching Assistant**, University of California, San Diego, La Jolla, CA. Course: Introductory Geology (undergrad). Instructor: Jill Weinberger
- 2005-2008 **Head Sailing Coach**, La Jolla High School and Torrey Pines High, La Jolla, CA

Students Mentored as Graduate Student and Postdoc (2008-2016):

Undergraduates: Allison Myers-Pigg (UW), Ariel Townsend (UW), Kesley Price (UW), Rebekka Gould (UW), Jordan Clear (UF), Miranda Craghead (UF), Robert Schmitz (UF), Eldo Santos (Universidade Federal do Amapá-UNIFAP)

Masters: William Gagne Maynard (UW), Rory Kates (UF), Genswesley Dias de Jesus (Universidade Federal do Espírito Santo-UFES), Luciano Firme de Almeida (UFES)

PhD: Diani Fernandes da Silva (UNIFAP), Joel Estevão Melo Diniz (UNIFAP)

Students/Postdocs Mentored as Research Scientist (2017-present):

DOE-SULI Interns at PNNL: Julia Indivero (2017-2018), Stephanie Cando (2018), Tyler Cook (2018), Matt Duggan (2021), Alex Izquierdo (2021), Krystal Krygowski (2019), Katherine Landoni (2019, 2020), Mulika Musyimi (2020-2021), Macy Schmidt (2020), Cora Weise Moore (2020), Madison Bowe (2021), Alex Izquierdo (2021)

Post-bachelors at PNNL: Cailene Gunn (2017-2018), Julia Indivero (2018-2020)

Postdocs at PNNL: Aditi Sengupta (2018-2020), Allison Myers-Pigg (2019-2020), Matt Norwood (2019-present), Peter Regier (2020-present)

Graduate Student Committee: Kleiton Rabelo de Araújo (2018, M.S., Universidade Federal do Pará, Altamira)

DOE Graduate Fellow: Megan Duffy (2021, Ph.D., University of Washington)