**Theresa O'Meara**
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**Education:**

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|---|---|---|---|
| 2014 | PhD | University of North Carolina at Chapel Hill | Environmental Science and Engineering |
| 2008 | BS | Hope College (Magna Cum Laude) | Chemistry<br>minor: Environmental Science |
| 2008 | BA | Hope College (Magna Cum Laude) | Biology<br>minor: Environmental Science |

**Appointments:**

| | |
|---|---|
| 2021- | R&D Associate Staff Scientist, Oak Ridge National Laboratory, Oak Ridge, TN |
| 2021- | Research Associate, Smithsonian Environmental Research Center, Edgewater, MD |
| 2017-2021 | Postdoctoral Fellow, Smithsonian Environmental Research Center, Edgewater, MD |
| 2016 | Visiting Scientist, Boston University, MA, Fulweiler Lab |
| 2014-2017 | Postdoctoral Fellow, University of Auckland, New Zealand, Institute of Marine Science |
| 2014 | NSF-REU Research Coordinator, Samford University, AL |
| 2013 | Graduate Research Fellow, UNC-CH, NC, IMS |
| 2012 | North Carolina Coastal Reserve-North Carolina Sea Grant Fellow, UNC-CH, NC, IMS |
| 2006 | Michigan Space Grant Consortium Fellow, Hope College, MI |
| 2005-2008 | Undergraduate Researcher, Hope College, MI |

**Advising:**

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|---|---|---|---|
| 2024- | Jorge Penaloza-Giraldo | Oak Ridge National Laboratory | Postdoc |
| 2023- | Alex Smith | Smithsonian Environmental Research Center | Postdoc |
| 2023-2024 | Wei Huang | Oak Ridge National Laboratory | Postdoc |
| 2022-2023 | Yongli Zhou | Marine Biological Laboratory | Postdoc |
| 2021-2023 | Wei Huang | Oak Ridge National Laboratory | Postdoc |
| 2016-2020 | Stefano Schenone | University of Auckland | PhD student |
| 2015-2016 | Emma Gibbs | University of Auckland | MSc student |
| 2015-2016 | Marcus Cameron | University of Auckland | PhD student |

**Peer-Reviewed Publications:**

1. Stegen, J, A Bergin, M Busch, J Fisher, **et al.** (accepted) Reviews and Syntheses: Variable Inundation Across Earth's Terrestrial Ecosystems. EGUsphere
2. Berns-Herrboldt, EC, **TA O'Meara**, EM Herndon, B Sulman, B Gu, DM Klingeman, KA Lowe, DE Graham (2025) Dynamic soil columns simulate Arctic redox biogeochemistry and carbon release during changes in water saturation. Scientific Reports DOI: 10.1038/s41598-024-83556-4
3. **O'Meara, T**, F Yuan, BN Sulman, GL Noyce, R Rich, PE Thornton, JP Megonigal (2024) Developing a redox network for coastal saltmarsh systems in the PFLOTRAN reaction model. JGR-Biogeosciences. DOI: 10.1029/2023JG007633
4. Patel, K, KA Rod, J Zheng, P Regier **et al.** (2024) Time to anoxia: Observations and predictions of oxygen drawdown following coastal flood events. Geoderma. DOI: 10.1016/j.geoderma.2024.116854
5. Li, B., Z Li, J Zheng, P Jiang, J Holmquist, PJ Regier, **et al.** (2024). Integrated effects of site hydrology and vegetation on exchange fluxes and nutrient cycling at a coastal terrestrial-aquatic interface. Water Resources Research, 60, e2023WR035580. DOI: 10.1029/2023WR035580

6. Wang, J, **T O'Meara**, S LaFond-Hudson, S He, K Maiti, E Ward, B Sulman (2024) Subsurface redox interactions regulate ebullitive methane flux in heterogeneous Mississippi River Deltaic wetland. Journal of Advances in Modeling Earth Systems. DOI: 10.1029/2023MS003762
7. Zhou, Y, **T O'Meara**, ZG Cardon, J Wang, B Sulman, AE Giblin, I Forbrich (2024). Simulated plant-mediated oxygen input has strong impacts on fine-scale porewater biogeochemistry and weak impacts on integrated methane fluxes in coastal wetlands. Biogeochemistry. DOI:10.1007/s10533-024-01145-z
8. Sulman, BN, J Wang, S LaFond-Hudson, **TA O'Meara**, F Yuan, S Molins, et al. (2024). Integrating tide-driven wetland soil redox and biogeochemical interactions into a land surface model. Journal of Advances in Modeling Earth Systems, 16, e2023MS004002. DOI:10.1029/2023MS004002
9. Machado-Silva, F, MN Weintraub, ND Ward, KO Doro, PJ Regier, **et al** (2024) Short-Term Groundwater Level Fluctuations Drive Subsurface Redox Variability Environmental Science & Technology DOI:10.1021/acs.est.4c01115
10. Sulman, BN, F Yuan, **T O'Meara**, B Gu, EM Herndon, J Zheng, PE Thornton, DE Graham (2022) Simulated hydrological dynamics and coupled iron redox cycling impact methane production in an Arctic soil. JGR-Biogeosciences. DOI: 10.1029/2021JG006662.
11. **O'Meara, TA**, PE Thornton, DM Ricciuto, G Noyce, R Rich, JP Megonigal (2021) Considering coasts: Adapting terrestrial models to characterize coastal habitats. Ecological Modelling. DOI: 10.1016/j.ecolmodel.2021.109561
12. Hillman, JR, AM Lohrer, **TA O'Meara**, SF Thrush. Influence of restored mussel reefs on denitrification in marine sediments (2021) Science of the Total Environment. DOI:10.1016/j.seares.2021.102099
13. Thrush SF, JE Hewitt, RV Gladstone-Gallagher, C Savage, C Lundquist, **T O'Meara**, A Vieillard, JR Hillman, S Mangan, EJ Douglas, DE Clarke, C Pilditch (2020) Cumulative stressors reduce the self-regulating capacity of coastal ecosystems. Ecological Applications. DOI: 10.1002/eap.2223
14. Hillman, JR, **TA O'Meara**, C Lundquist, SF Thrush (2020) Loss of large animals differentially influence nutrient fluxes across a heterogeneous marine intertidal soft-sediment ecosystem. Ecosystems
15. **O'Meara T**, JE Hewitt, SF Thrush, EJ Douglas, AM Lohrer (2020) Denitrification and the role of macrofauna along estuarine gradients in nutrient and sediment loading. Estuaries and Coasts DOI: 10.1007/s10021-020-00517-4
16. Crawshaw J, **TA O'Meara**, C Savage, B Thomson, F Balter, S Thrush (2019) Carbon lability influences nitrogen cycling rates in temperature estuary sediment. Biogeochemistry 145: 315-335.
17. Schenone S, **TA O'Meara**, SF Thrush (2019) Non-linear effects of macrofauna functional trait interactions on biogeochemical fluxes in marine sediments change with environmental stress. Marine Ecology Progress Series 624:13-21
18. **O'Meara T**, E Gibbs, SF Thrush (2018) Rapid organic matter assay (ROMA) of carbon degradation across depth gradients in marine sediments, Methods in Ecology and Evolution 9: 245-253.
19. Ray N, **T O'Meara**, T Williamson, JL Izursa (2018). Carbon dioxide release from shell formation must be included in LCA of bivalves. International Journal of Life Cycle Assessment 23:5 1042-1048.
20. **O'Meara T**, JR Hillman, SF Thrush (2017) Rising tides, cumulative impacts and cascading changes to estuarine ecosystem functions, Scientific Reports 7, Article number: 10218.
21. **O'Meara T**, SP Thompson, MF Piehler (2015). Effects of shoreline hardening on nitrogen processing in estuarine marshes of the US Mid-Atlantic Coast. Wetlands Ecology and Management. 23(3): 385-394
22. Peterson JW, **TA O'Meara**, MD Seymour (2014) Effects of Added Fe°, $Fe_3O_4$ and $Fe_2O_3$ on Sorption of Cephalosporin Antibiotic in Quartz-rich Sands. Journal of Environmental Engineering 140(1): 40-47
23. Keeler A, L Dubbs, **T O'Meara** (2013) Permitting, Risk, and Marine Hydrokinetic Energy Development. The Electricity Journal 26(10): 64-74
24. Peterson JW, **TA O'Meara**, MD Seymour, W Wang, B Gu (2009) Sorption mechanisms of cephapirin, a veterinary antibiotic, onto quartz and feldspar minerals as detected by Raman spectroscopy. Environmental Pollution 157(6): 1849-1856
25. Peterson JW, **TA O'Meara**, MD Seymour (2008) Experimental Investigation of Cephapirin Adsorption to Quartz Filter Sands and Dune Sands. Hydrogeology Journal 16(5): 879-892

**Thesis:**
O'Meara, T (2014) Anthropogenic Effects on Estuarine Shoreline Primary Productivity and Nutrient Cycling, UNC-CH Library, April 2014

**Invited Presentations:**

O'Meara, T et al. (2024) MODEX approached to understanding Methane Dynamics, Methane Workshop, University of Maine, Orono, ME August 15

O'Meara, T, W Huang, J Holmquist, P Megonigal (2023) Using an earth system model to investigate connections between eco-geomorphic feedbacks and biogeochemical processes in coastal terrestrial aquatic interfaces. Ecological Society of America Annual Meeting. Portland, OR USA, August 8

O'Meara, T et al. (2022) Multi-scale observations and modeling for improved prediction of coastal weltnad processes. Oral Presentation. ESS-PI Meeting. Bethesda, MD USA, May

O'Meara, T (2020) Roots in Models: Aerenchyma and nutrient processing in PFLOTRAN, Oak Ridge National Laboratory, virtual, October 22

O'Meara T (2020) TAI modelling in ELM, Oak Ridge National Laboratory, Oak Ridge, TN January 24

O'Meara T (2019) Understanding the Junction Between Chemistry and Function: Using biogeochemical fluxes to understand ecosystem function in estuaries, Eckerd College, St. Petersburg, FL November 19

O'Meara T (2019) From Terrestrial to Coastal: ModEx projects in the TAI, U.S. Department of Energy, Biological and Environmental Research, Germantown, MD September 11

O'Meara T (2018) Rapid assessment of organic matter degradation in marine sediments (ROMA method). Oak Ridge National Laboratory, Oak Ridge, TN February 23

O'Meara T, SF Thrush (2016) Effects of multiple environmental stressors on networked ecosystem functions. University of New South Wales, Sydney, Australia March 14

O'Meara T, SF Thrush (2016) Estuaries and the Anthropocene. Faculty of Science Postdoctoral Society. University of Auckland, Auckland, New Zealand November 15

O'Meara T (2012) Denitrification from the Maritime Forest to the Shallow Subtidal. The 2012 National Estuarine Research Reserve/National Estuarine Research Reserve Association Annual Meeting, Shepherdstown, WV, November

O'Meara T (2012) Changes in denitrification from the maritime forest to the shallow subtidal in natural and restored systems. National Estuarine Research Reserve Staff Meeting, Pivers Island, NC May 1

O'Meara TA (2006), Experimental Investigation of Antibiotic Adsorption in Sand-Iron Systems. Michigan Academy of Science, Arts, and Letters Annual Meeting, Rochester, MI, March

O'Meara TA, JW Peterson, and MD Seymour (2006) Experimental Investigation of Antibiotic Adsorption in Sand-Iron Systems: Implications for Transport in Groundwater. Michigan Space Grant Consortium Annual Meeting, Ann Arbor, MI, October

O'Meara TA, JW Peterson, and MD Seymour (2006) Adsorption of antibiotics to sands amended with magnetite, hematite, and zero-valent Fe. Hope College Celebration of Undergraduate Research, Holland, MI, March

O'Meara TA, JW Peterson, and MD Seymour (2005) Fate and transport of antibiotics in sand aquifers. Hope College Celebration of Undergraduate Research, Holland, MI March

**Meeting Presentations:**

O'Meara, T, S Bhanja, W Huang, S LaFond-Hudson, S Rathore, D Ricciuto, X Shi, A Smith, B Sulman, P Thornton, J Wang, F Yuan (2024) Improving representation of wetlands in Earth system models. SC SeaGrant Forested Wetlands of the Upper Estuary, Charleston, SC, March

O'Meara, T, P Thornton, B Bond-Lamberty, X Chen, K Doro et al (2022) Multi-scale observations and modeling for improved prediction of coastal wetland processes, ESS PI Meeting, virtual, April

O'Meara, T, R Rich, G Noyce (2022) Plant responses to warming, salinity, and inundation regulate methane fluxes in coastal systems. Poster. American Geophysical Union. Chicago, IL USA, December

O'Meara, T et al (2021) Modelling the effects of elevated CO2 and temperature on plant-soil interactions in terrestrial aquatic interfaces. Poster. virtual, December

O'Meara, T (2021) Developing a redox network for coastal saltmarsh systems in PFLOTRAN. Oral presentation. Society for Wetland Scientists. Virtual, June

O'Meara T, D Ricciuto, G Noyce, B Sulman, F Yuan, R Rich, P Thornton, P Megonigal (2019) Considering coasts: adapting terrestrial models to characterize coastal habitats. *Oral Presentation*. Coastal and Estuarine Research Federation. Mobile, AL, November

O'Meara T, P Thornton, G Noyce, F Yuan, D Ricciuto, JP Megonigal (2019) Modelling coastal wetland vegetation dynamics. *Oral presentation*. 6th Annual GCReW Symposium, Edgewater, MD, March

O'Meara T, P Megonigal, G Noyce, R Rich, F Yuan, D Ricciuto, P Thornton (2019) Building Coastal Models with the Salt Marsh Accretion Response to Temperature eXperiment (SMARTX) Environmental System Science PI Meeting, Potomac, MD, April 30 – May 1

Thornton P, T O'Meara (2019) ORNL E3SM progress updates. *Oral Presentation*. Spring E3SM Project Meeting, Westminster, CO March

O'Meara T, P Thornton, JP Megonigal (2018) Considering coasts: adapting terrestrial models to characterise coastal habitats. *Poster*. American Geophysical Union, Washington, D.C. USA, December

O'Meara T, JR Hillman, and SF Thrush (2018) Mussels vs mud: Using mussels to restore ecosystem function across turbidity gradients. *Oral presentation.* World Conference on Marine Biodiversity, Montréal, Canada May

O'Meara T, JR Hillman, and SF Thrush (2017) Rising tides, cumulative impacts and cascading changes to estuarine ecosystem functions. *Oral presentation.* New Zealand Marine Sciences Society, Christchurch, New Zealand July

O'Meara T (2016) Getting tanked up in preparation for climate change. *Oral Presentation.* Estuarine Coastal Sciences Association, Bremen, Germany September

O'Meara T (2015) Denitrifiers in the coastal gradient. *Oral Presentation.* New Zealand Marine Sciences Society Conference, Auckland, New Zealand July

O'Meara T and MF Piehler (2014) Denitrifiers in the coastal gradient: Potential Contributions to the $N_2O$ budget. *Poster*. Joint Aquatic Sciences Meeting, Portland, OR, May

O'Meara T and MF Piehler (2011) Dueling Algae: macro- vs micro- algal dominance in a warming world. *Oral Presentation*. UNC Institute of Marine Science Student-Led Symposium, Morehead City, NC, September

O'Meara T and MF Piehler (2011) Effects of shoreline hardening on nitrogen processing in salt marshes. *Poster*. 11th International Estuarine Biogeochemistry Symposium, Atlantic Beach, NC May 2011

O'Meara TA, JW Peterson, and MD Seymour (2006) Cephapirin Adsorption in Sand-Iron Systems: Effects of Hematite, Magnetite, and Zero-valent Iron. *Oral Presentation*. Annual Meeting of the Geological Society of America, Philadelphia, PA, October

O'Meara TA, JW Peterson, and MD Seymour (2005) Experimental Investigation of Cephapirin Adsorption to Sands: Implications for Transport of Antibiotics in Groundwater. *Poster*. Annual Meeting of the Geological Society of America, Salt Lake City, UT October

**Professional Service:**

*Reviewer/Review Editor*

Journals: Frontiers in Marine Ecosystem Ecology, Marine Ecology Progress Series, Journal of Environmental Management, Wetlands Ecology and Management, Atmosphere, Wetlands, Global Biogeochemical Cycles

Proposals: Maryland Sea Grant (2019, 2023), U.S. Department of Energy (2019)

*Workshops*

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| 2024 | Participant | *Methane Workshop*<br>Woodwell Climate Research Center, University of Maine, Orono, ME |
| 2022 | Participant | *Variable Inundation across Environments Workshop (VIEW)*<br>Pacific Northwest National Laboratory, Richland, WA |
| 2021 | Participant | *Gulf Coast TAI Workshop*<br>Oak Ridge National Laboratory, Oak Ridge, USA |
| 2020 | Participant | *SPRUCE 2020 – Methane Cycling*<br>Oak Ridge National Laboratory, Oak Ridge, USA |
| 2019 | Organizer | *ModEx Approaches to Research on Shorelines (MARSh)*<br>Oak Ridge National Laboratory, Oak Ridge, USA |
| 2017 | Organizer | *Identifying and predicting marine tipping points*<br>University of Auckland, Leigh Marine Laboratory, New Zealand |
| 2017 | Participant | *Identifying factors driving nutrient removal in the coastal marine environment* |

NIWA, Hamilton, New Zealand

*Conferences*

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| 2024 | Abstract review, session chair, AGU Fall Meeting, Washington, DC December 9-13 |
| 2022 | Session chair, AGU Fall Meeting, Chicago, IL December 12-16 |
| 2020 | Abstract review, *ESA Annual Meeting*, Salt Lake City, UT August 2-7 |
| 2019 | Student presentation judge, *CERF Biennial Meeting*, Mobile, AL November 3-7 |
| 2015 | Session moderator & student presentation judge, *NZMSS-OCS*, Auckland, New Zealand July 6-9 |
| 2014 | Session moderator & abstract review, *Water Microbiology Conference*, Chapel Hill, NC May 5-7 |

**Collaborators & Co-Authors:**

A Al-Haj (SERC), V Bailey (PNNL), E Berns (University of Wisconsin – Green Bay), B Bond-Lamberty (PNNL), Z Cardon (MBL), X Chen (PNNL), D Day (University of Toledo), K Doro (University of Toledo), I Forbrich (University of Toledo), A Giblin (MBL), D Graham (ORNL), B Gu (ORNL), G Hammond (PNNL), S He (LSU), E Herndon (ORNL), J Holmquist (SERC), W Huang (FIU), M Kaufman (PNNL), K Kemner (ANL), Sophie LaFond-Hudson (USGS), B Li (PNNL), Z Li (PNNL), F Machado-Silva (University of Toledo), K Maiti (LSU), N McDowell (PNNL), S McKever (PNNL), JP Megonigal (SERC), S Mollins (LBNL), A Myers-Pigg (PNNL), C Norris (PNNL), G Noyce (SERC), K Patel (PNNL), S Pennington (PNNL), M Piehler (UNC Chapel Hill), P Regier (PNNL), D Ricciuto (ORNL), R Rich (SERC), B Sulman (ORNL), P Thornton (ORNL), SF Thrush (University of Auckland), J Wang (University of Maine), N Ward (PNNL), E Ward (USGS), M Weintraub (University of Toledo), F Yuan (ORNL), J Zheng (PNNL), Y Zhou (MBL).