

## Philip Mark Orton

Stevens Inst. of Technology, Castle Point on Hudson, 210 Davidson Laboratory, Hoboken, NJ 07030  
(201) 216-8095, philip.orton@stevens.edu, <http://philiporton.com>

### RESEARCH INTERESTS

Estuary and coastal physical oceanography; storm surges and sea level rise; urban coastal adaptation; estuary biogeochemistry; turbulent mixing; air-sea interaction and gas exchange; sediment transport and morphologic change; urban and coastal atmospheric science; numerical ocean, atmosphere and sediment modeling.

### PROFESSIONAL PREPARATION

University of Michigan	physical oceanography	B.S. 1994
University of South Carolina	marine science	M.S. 1996
Columbia University	physical oceanography	Ph.D. 2010
Stevens Institute of Technology	oceanic and atmospheric physics	post-doc 2010-2011

### RESEARCH POSITIONS HELD

2014 - current Research Assistant Professor, Stevens Institute of Technology  
2012 - 2013 Research Scientist, Stevens Institute of Technology  
2011 - 2012 Postdoctoral Research Scientist, Stevens Institute of Technology  
2010 (3 mo) Postdoctoral Research Scientist, Lamont-Doherty – NSF-RAPID oil spill grant  
2004 - 2010 Graduate Research Assistant, Lamont-Doherty Earth Observatory, Columbia U.  
1998 - 2003 Research Associate, Oregon Graduate Institute  
1997 - 1998 Research Assistant, United States Geological Survey  
1995 - 1996 Graduate Research Assistant, University of South Carolina

### AWARDS / GRANTS

2010 - present Lead or co-author on 18 funded research proposals worth \$3.6 million from 11 diverse federal, state and city agencies (NSF, USACE, NOAA, NASA, NPS, ONR, Sea Grant, NYSERDA, NYC, NJ-DEP, HRF)  
2014 - 2015 Buckminster Fuller design challenge award, 2015 ACEC New York PLATINUM AWARD, AIA Architecture collaboration award – all for flood adaptation design  
2014 Housing and Urban Development Rebuild By Design – winning design team

### TEACHING & MENTORING

2017 Supervised a Master's Degree thesis, Praneeth Gurumurthy  
2016 - 2017 Supervising one Ph.D. student, Fanglin Zhang  
2015 - 2017 Supervising a post-doctoral scientist with three peer-reviewed publications  
2016 Co-taught Intermediate Fluid Dynamics for undergraduate and graduate students  
2011 - 2012 Guest lectures for graduate-level courses (sea level rise, storm surges)  
2008 - 2013 Supervised or co-supervised six summer research internships  
2006 Guest lectures for graduate-level courses (carbon cycle, physical oceanography)  
2005 - 2006 Teaching assistant, "Dynamics of Climate Variability and Change"

## **SYNERGISTIC ACTIVITIES**

Governmental service/science - Member, NYC Panel on Climate Change (NPCC; (2013-present), appointed by New Jersey's Governor to the New Jersey Wetland Mitigation Council (2017-present), New Jersey Climate Adaptation Alliance, Science and Technical Advisory Panel (2015-6), Adviser to NYC's Special Initiative on Rebuilding and Resilience after Sandy (2013)

Media coverage - Hurricane Sandy and coastal flood adaptation media: national, local TV/newsprint (ABC 20/20, MSNBC, NPR, PBS, FOX, NBC, CBS, WNYC, New York Times)

Opinion/Editorial – New York Times Op-Eds: *The Next Mayor of New York Needs to Continue to Lead on Climate* (2013); (On question “Should New York Build Sea Gates?”) *Big Projects, Big Problems, So Think Small* (2012); *Sniffing Out the Truth* (2007)

Science Blog - Lead author of <http://SeaAndSkyNY.com> blog (80000+ views)

Peer-review - Reviewer for the National Science Foundation, Environmental Protection Agency, The Water Institute of the Gulf, Sea Grant, Hudson River Foundation, Journal of Physical Oceanography, Nature Climate Change, Journal of Geophysical Research, Geophysical Research Letters, Deep Sea Research, Journal of Atmospheric and Oceanic Technology, Climatic Change, Journal of Marine Science and Engineering, Ocean and Coastal Management, Journal of Waterway, Port, Coastal and Ocean Engineering, Scientific Reports, Bulletin of the American Meteorological Society, Natural Hazards

## **COLLABORATORS AND OTHER AFFILIATIONS (last five years)**

Collaborators - Alan Blumberg, Julie Pullen, Nickitas Georgas, Sergey Vinogradov, Jon Miller, Thomas Herrington – Stevens Institute of Technology; Tim Hall, Cynthia Rosenzweig – NASA-GISS; Teddy Holt, James Doyle - Naval Research Laboratory; Upmanu Lall, Cynthia Rosenzweig, Radley Horton, Malgosia Madajewicz, Vivien Gornitz – Columbia University; Wade McGillis, Chris Zappa – LDEO/Columbia Univ.; David Jay, Stefan Talke - Portland State Univ.; Eric Sanderson, Wildlife Conservation Society; Kytt McManus, Columbia CIESIN; Hugh Roberts, Arcadis, Inc.; Kate Orff, Scape Studios and Columbia University; Ben Strauss, Climate Central; Jon Woodruff, Univ. Massachusetts Amherst.

Graduate Advisers and Postdoctoral Sponsors: M.S. Gail Kineke, Boston College; post-M.S. David Jay, Portland State University; Ph.D. Wade McGillis and Chris Zappa, Lamont-Doherty Earth Observatory of Columbia University; post-doctoral Alan Blumberg and Julie Pullen, Stevens Institute of Technology.

MS Thesis Supervisor: Praneeth Gurumurthy, 2017

PhD Supervisor: Fanglin Zhang, 2016-present, Praneeth Gurumurthy, 2017-present

Postdoctoral Research Supervisor to Reza Marsooli, 2014-2016; Roham Bahktyar, 2015-present.

## **PEER-REVIEWED PUBLICATIONS (underlined cases, as graduate/postdoc adviser)**

1. Marsooli, R., P.M. Orton, G. Mellor, N. Georgas, and A. Blumberg, in press. A Coupled Circulation-Wave Model for Numerical Simulation of Storm Tides and Waves, *J. Atmo. Oceanic Tech.*

2. Marsooli, R., P.M. Orton, and G. Mellor, 2017. Modeling wave attenuation by salt marshes in Jamaica Bay, New York, using a new rapid wave model, *Journal of Geophysical Research - Oceans*, 122, doi:10.1002/2016JC012546.
3. Orton, P. M., T. M. Hall, S. Talke, A. F. Blumberg, N. Georgas, and S. Vinogradov, 2016. A Validated Tropical-Extratropical Flood Hazard Assessment for New York Harbor, *J. Geophys. Res.*, 121. doi: 10.1002/ 2016JC01167.
4. Close, S. L., F. Montalto, P. Orton, A. Antoine, D. Peters, H. Jones, A. Parris, and A. Blumberg, 2016. Achieving sustainability goals for urban coasts in the US Northeast: research needs and challenges, *Local Environment*, doi:10.1080/13549839.2016.1233526.
5. Georgas, N., L. Yin, Y. Jiang, Y. Wang, P. Howell, V. Saba, J. Schulte, P. Orton, and B. Wen, 2016. An Open-Access, Multi-Decadal, Three-Dimensional, Hydrodynamic Hindcast Dataset for the Long Island Sound and New York/New Jersey Harbor Estuaries, *Journal of Marine Science and Engineering*, 4(48), DOI: 10.3390/jmse4030048.
6. Marsooli, R., P.M. Orton, N. Georgas, and A. F. Blumberg, 2016. Three-Dimensional Hydrodynamic Modeling of Coastal Flood Mitigation by Wetlands, *Coast. Eng.*, 111, 83-94.
7. Brandon, C. M., J. D. Woodruff, P. M. Orton, and J. P. Donnelly, 2016. Evidence for Elevated Coastal Vulnerability Following Large-Scale Historical Oyster Bed Harvesting, *Earth Surface Processes and Landforms*, DOI: 10.1002/esp.3931.
8. Orton, P. M., S. A. Talke, D. A. Jay, L. Yin, A. F. Blumberg, N. Georgas, H. Zhao, H. J. Roberts, and K. MacManus, 2015. Channel Shallowing as Mitigation of Coastal Flooding, *Journal of Marine Science and Engineering*, 3(3), 654-673, DOI: 10.3390/jmse3030654.
9. Blumberg, A., N. Georgas, L. Yin, T. Herrington, and P. Orton, 2015. Street scale modeling of storm surge inundation along the New Jersey Hudson River waterfront, *J. Atmos. Oceanic Technol.*, DOI: 10.1175/JTECH-D-14-00213.1.
10. Orton, P., S. Vinogradov, N. Georgas, A. Blumberg, N. Lin, V. Gornitz, C. Little, K. Jacob, and R. Horton, 2015. New York City Panel on Climate Change 2015 Report Chapter 4: Dynamic Coastal Flood Modeling. *Annals of the New York Academy of Sciences*, 1336(1), 56-66.
11. Wang, J., D. G. MacDonald, P. M. Orton, K. Cole, and J. Lan, 2015. The Effect of Discharge, Tides, and Wind on Lift-Off Turbulence, *Estuaries Coasts*, 1-15, DOI: 10.1007/s12237-015-9958-y.
12. Georgas, N., Orton, P., Blumberg, A., Cohen, L., Zarrilli, D. and Yin, L, 2014. The Impact of Tidal Phase on Hurricane Sandy's Flooding around New York City and Long Island Sound, *Journal of Extreme Events*, DOI: 10.1142/S2345737614500067.
13. Talke, S., P. Orton, and D. Jay, 2014. Increasing Storm Tides at New York City, 1844-2013. *Geophys. Res. Lett.*, 41, DOI: doi:10.1002/2014GL059574.
14. Meir, T., Orton, P.M., Pullen, J., Holt, T., Thompson, W.T., Arend, M.F., 2013. Forecasting the New York City urban heat island and sea breeze during extreme heat events. *Weather and Forecasting*. doi: 10.1175/WAF-D-13-00012.1
15. Orton, P., N. Georgas, A. Blumberg, and J. Pullen, 2012. Detailed Modeling of Recent Severe Storm Tides in Estuaries of the New York City Region, *J. Geophys. Res.*, 117:C09030, doi:10.1029/2012JC008220.
16. Harrison, E., Veron, F. Ho, D., Reid, M., Orton, P. and McGillis, W., 2012. Nonlinear interaction between rain-and wind-induced air-water gas exchange, *J. Geophys. Res.*, 117(C3), C03034.

17. Ho, D.T., Schlosser, P. and Orton, P.M., 2011. On factors controlling air-water gas exchange in a large tidal river, *Estuaries and Coasts*, 34:1103-1116, DOI: 10.1007/s12237-011-9396-4.
18. Orton, P.M., McGillis, W.R., and Zappa, C.J., 2011. An autonomous self-orienting catamaran for measuring air-water fluxes and forcing. In: *Gas Transfer at Water Surfaces*, edited by S. Komori et al., Kyoto University Press.
19. Orton, P. M., Zappa, C.J., and McGillis, W.R., 2010. Tidal and atmospheric influences on near-surface turbulence in an estuary, *J. Geophys. Res.*, 115, C12029, doi:10.1029/2010JC006312.
20. Orton, P.M., McGillis, W.R., and Zappa, C.J., 2010. Sea breeze forcing of estuary turbulence and CO<sub>2</sub> exchange. *Geophys. Res. Lett.*, 37, L13603, doi:10.1029/2010GL043159.
21. Hickey, B. M., R. M. Kudela, J. D. Nash, K. W. Bruland, W. T. Peterson, P. MacCready, E. J. Lessard, D. A. Jay, N. S. Banas, A. M. Baptista, E. P. Dever, P. M. Kosro, L. K. Kilcher, A. R. Horner-Devine, E. D. Zaron, R. M. McCabe, J. O. Peterson, P. M. Orton, J. Pan, and M. C. Lohan, 2010. River Influences on Shelf Ecosystems: Introduction and Synthesis, *J. Geophys. Res.*, doi:10.1029/2009JC005452.
22. Horner-Devine, A., Jay, D.A., Orton, P.M., and Spahn, E., 2009. A conceptual model of the strongly tidal Columbia River plume. *Journal of Marine Systems*, 78(3): 460–475, doi:10.1016/j.jmarsys.2008.11.025.
23. Jay, D.A., Pan, J., Orton, P.M., and Horner-Devine, A., 2009. Asymmetry of tidal plume fronts in an eastern boundary current regime. *Journal of Marine Systems*, 78(3): 442-459, doi:10.1016/j.jmarsys.2008.11.015.
24. Orton, P.M. and Visbeck, M., 2009. Variability of internally generated turbulence in an estuary, from 100 days of continuous observations. *Continental Shelf Research*, doi:10.1016/j.csr.2007.07.008.
25. Pan, J., Jay, D. A., and Orton, P. M., 2007. Analyses of internal solitary waves generated at the Columbia River plume front using SAR imagery, *J. Geophys. Res.*, 112, C07014, doi:10.1029/2006JC003688.
26. Jay, D. A., Orton, P. M., Chisholm, T., Wilson, D.J., and Fain, A.M.V. 2007. Particle trapping in stratified estuaries: Consequences of mass conservation. *Estuaries and Coasts* 30(6), 1095-1105, doi: 10.1007/BF02841399.
27. Jay, D. A., Orton, P. M., Chisholm, T., Wilson, D.J., and Fain, A.M.V. 2007. Particle trapping in stratified estuaries: Application to observations. *Estuaries and Coasts* 30(6), 1106-1125, doi: 10.1007/BF02841400.
28. Orton, P. M., and Jay, D. A., 2005. Observations at the tidal plume front of a high-volume river outflow, *Geophys. Res. Lett.*, 32, L11605, doi:10.1029/2005GL022372.
29. Emmett, R.L, Brodeur, R.D. and Orton, P.M. 2004. The vertical distribution of juvenile salmon (*Oncorhynchus* spp.) and associated fishes in the Columbia River plume. *Fisheries Oceanography* 13:6, 392-402, doi: 10.1111/j.1365-2419.2004.00294.x.
30. Fain, A.M.V., Jay, D. A., Wilson, D. J., Orton, P. M., and Baptista, A. M. 2001. Seasonal, monthly and tidal patterns of particulate matter dynamics in the Columbia River estuary, *Estuaries* 24: 770-786, doi: 10.2307/1352884.
31. Orton, P.M. and Kineke, G.C. 2001. Comparing calculated and observed vertical suspended sediment distributions from a Hudson River Estuary turbidity maximum. *Estuarine, Coastal and Shelf Science*, 52(3), 401-410, doi: 10.1006/ecss.2000.0747.