

Philip Mark Orton

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RESEARCH INTERESTS

Estuary and coastal ocean physics; storm surges and sea level rise; urban coastal adaptation; turbulent mixing; air-sea interaction and gas exchange; sediment transport; urban and coastal atmospheric science; numerical ocean and atmospheric modeling.

EDUCATION

2010 Columbia University, Ph.D., physical oceanography
Minors: chemical oceanography, fluid dynamics
Graduate Advisor: W.R. McGillis
Dissertation Title: Estuarine turbulence and air-water CO₂ transfer
1996 University of South Carolina, M.S., marine science (adviser: Gail Kineke)
1994 University of Michigan, B.S., physical oceanography

RESEARCH POSITIONS HELD

2012 - current Research Scientist, Stevens Institute of Technology
2010 - 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

GRANTS

2013 NY Sea Grant, “Analyzing history to project and manage the future: Simulating the effects of climate on Long Island Sound’s physical environment and living marine resources” (N. Georgas, PI; Orton, Blumberg, Howell, Co-PIs; \$380k)
2013 New York City Office of Emergency Management, “Proposed technical study of the effects of sea level rise on coastal flooding in New York City” (Orton, Blumberg, Georgas, Gornitz; \$180k)
2012 NYSERDA: “The Hudson River Flood Hazard Decision Support System – Accurate Modeling of Flood Zones for Combined Sea Level Rise, Storm Surge, and Rain” (Co-lead author with M. Becker, PI; Blumberg, Lall, Co-PIs, \$300k)
2012 NOAA-COCA: “Building resilience to storm surges and sea level rise: A comparative study of coastal zones in New York City and Boston (M. Madajewicz lead PI; A. Blumberg Co-PI; P. Orton and M. Becker, Co-Is; \$300k)
2011 NASA: “Hurricane Wind and Inundation Risk on the U.S. Northeast and New York City” (T. Hall, PI; P. Orton, A. Blumberg, co-authors; \$300k)
2010 NSF, “RAPID: Impact of Gulf Oil Surface Films on Atmosphere-Ocean Exchange” (W. McGillis, PI; P. Orton, co-author, \$124k)

Philip Mark Orton, Curriculum Vitae

2001 NOAA-NESDIS, "Satellite Ocean Front Mapping in Support of Salmonid Resource Management" (D. Jay, T. Sanders, I. Belkin, R. Brodeur, PIs; P. Orton lead author; \$188k)

RESEARCH COLLABORATORS

Julie Pullen, Alan Blumberg – Stevens Institute of Technology; Tim Hall, Cynthia Rosenzweig – NASA-GISS; Teddy Holt, William Thompson- Naval Research Laboratory; Upmanu Lall, Cynthia Rosenzweig, Radley Horton, Malgosia Madajewicz, Vivien Gornitz, Linda Sohl – Columbia University; Wade McGillis, Chris Zappa – LDEO/Columbia Univ.; David Jay - Portland State Univ.; David Ho, Univ. Hawaii.

TEACHING & MENTORING

2011 - 2012 Guest lectures for graduate-level courses (sea level rise, storm surges)
2011 - 2012 Lead author of a group science blog with 33000 hits, <http://seaandskyny.com>
2008 - 2009 Supervised student research, installed, networked environmental sensors, Harlem
2008 Lecturer and debater on climate, Rae Kushner Yeshiva High School
2008 Mentored summer intern Jay DeLanoy in research and attending a conference
2006 Guest lectures for graduate-level courses (carbon cycle, physical oceanography)
2005 - 2006 Teaching assistant, "Dynamics of Climate Variability and Change"
2003 Mentored summer intern Chandler Hatton in research on river-ocean iron fluxes

SYNERGISTIC ACTIVITIES

2013 Invited and testified, NY State Assembly hearing on extreme weather and climate
2012 Hurricane Sandy: local TV/newsprint, national TV (ABC 20/20, MSNBC)
2012 NY Times editorial, [Should New York Build Sea Gates? Big Projects, Big Problems, So Think Small](#)
2011 - 2012 Technical Input Team Author, *Climate Change in the Northeast: A Sourcebook*, for the *NorthEast Region* chapter of the 2013 National Climate Assessment report
2011 Live television interview on Hurricane Irene, on WNBC Nightly News with Chuck Scarborough. August 25, 2011. [Youtube](#)
2010 - 2012 Lead author of science blog (46000 views) <http://SeaAndSkyNY.com>
2009 - 2010 Supervised student research, installed, networked environmental sensors, Harlem
2009 Higinbotham, J.R., Moisan, J. and Orton, P. 2009. Solar Powered Autonomous Surface Vehicle Development and Operation. *Sea Technology* 50(7)
2009-2011 Reviewer for National Science Foundation, Environmental Protection Agency, *Journal of Geophysical Research*, *Journal of Atmo. and Oceanic Technology*
2007 O'Mullan, G., Orton, P., McGillis, W., Sambrotto, R., and Mailloux, B., Sniffing out the Truth, *NY Times Sunday Edition*, Opinions Section, January 21, 2007

PEER-REVIEWED PUBLICATIONS

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.

Philip Mark Orton, Curriculum Vitae

- 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.
- 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.
- 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.
- 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.
- Orton, P.M., McGillis, W.R., and Zappa, C.J., 2010. Sea breeze forcing of estuary turbulence and CO₂ exchange. *Geophys. Res. Lett.*, 37, L13603, doi:10.1029/2010GL043159.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.