

Philip Mark Orton, Curriculum Vitae

Lamont-Doherty Earth Observatory of Columbia University • 61 Route 9W, Palisades, NY 10964 • (845) 365-8317 • orton@ldeo.columbia.edu • <http://www.ldeo.columbia.edu/~orton>

RESEARCH INTERESTS

Air-sea interaction and gas exchange; estuary and coastal ocean physics; turbulent mixing; sediment transport; physical forcing of biogeochemical exchanges – water-atmosphere, sediment-water, and land-ocean transports; autonomous measurement platforms and robotic boats.

EDUCATION

2004 - current Columbia University, Ph.D. anticipated Feb 2010, physical oceanography
Minors: chemical oceanography, fluid dynamics
Graduate Advisors: W. McGillis, M. Visbeck (now at IFM-GEOMAR)
Dissertation Title: Estuarine turbulence and air-water gas transfer
1996 University of South Carolina, M.S., marine science (adviser: Gail Kineke)
1994 University of Michigan, B.S., physical oceanography

RESEARCH SKILLS

I specialize in field observations and statistical analyses, but also have done research using computer models. My experience includes:

- setting up and deploying autonomous measurement platforms, instrumenting robotic boats
- use of a wide variety of oceanographic and atmospheric instrumentation
- oceanographic research cruises (total: 217 days)
 - as chief scientist overseeing three technicians (22 days, 3 cruises)
 - as watch chief overseeing five technicians (20 days, 1 cruise)
 - operating a small outboard motorboat (55 days)
- ecological modeling (STELLA), wave modeling (HISWA)
- 1-D turbulence and transport modeling (e.g. General Ocean Turbulence Model)

RESEARCH POSITIONS HELD

2004 - Graduate Research Assistant, Lamont-Doherty Earth Observatory
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 / FUNDING

2009 Funded to attend SOLAS Summer School, also won best poster award
2008-9 NSF GK-12 fellowship ("Learning through Earth & Environ. Field Studies")
2007-8 Hudson River Foundation Graduate Fellowship
2007 NASA Graduate Student Summer Program in Earth Science
2003 Provided a major conceptual aspect of a funded \$8M NSF proposal (not a PI)
2001 Lead author and instigator of a funded \$188k proposal to NOAA (not a PI)

Philip Mark Orton, Curriculum Vitae

RESEARCH COLLABORATORS

Wade McGillis, Chris Zappa - LDEO; David Jay - Portland State University; John Moisan – NASA-WFF; Martin Visbeck - IFM- GEOMAR, Kiel, Germany; Dan Macdonald - University of Massachusetts Dartmouth, Rob Hetland - University of Texas; Igor Belkin - University of Rhode Island; Richard Brodeur, NOAA-Fisheries.

TEACHING & MENTORING

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
1994 - 1996 Teaching Assistant, then curriculum developer, University of South Carolina

PEER-REVIEWED PUBLICATIONS

Orton, P.M., Moisan, J.R., Higinbotham, J.R., Schirtzinger, C., and McGillis, W.R.. An Autonomous Surface Vehicle for Integrated Ocean-Atmosphere Studies. Submitted to *Geophysical Research Letters*.

Orton, P.M., McGillis, W.R., and Zappa, C.J. An autonomous self-orienting catamaran for measuring atmospheric-aquatic fluxes and forcing. Submitted to *Limnology and Oceanography: Methods*.

Hickey, B.M., and 19 others. River influences on shelf ecosystems: Introduction and synthesis. Submitted to *Journal of Geophysical Research*.

Horner-Devine, A., Jay, D.A., Orton, P.M., and Spahn, E., 2009. A conceptual model of the strongly tidal Columbia River plume. In press, *Journal of Marine Systems*.

Jay, D.A., Pan, J., Orton, P.M., and Horner-Devine, A., 2009. Asymmetry of tidal plume fronts in an eastern boundary current regime. In press, *Journal of Marine Systems*.

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.

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.

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.

Philip Mark Orton, Curriculum Vitae

- 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.
- 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.

INVITED ORAL PRESENTATIONS

- Orton, P.M. Probing the depths of the world's biggest problems with a PhD in oceanography, Columbia careers lecture series for undergraduates, October 14, 2008.
- Orton, P.M.. Lecturer and forum/debate panelist, Rae Kushner Yeshiva High School all-day global warming event, held in the school's auditorium, January 30, 2008.
- Orton, P.M. and Jay, D.A. The Role of Mixing in Columbia Estuarine Trapping and Transport. Conference on Research, Monitoring and Restoration in the Lower Columbia River, Estuary and Nearshore Ocean. Astoria, Oregon, April 19-20, 2006.
- Orton, P.M. Hudson River estuary turbulent mixing. The Hudson River Foundation workshop *Circulation and Mixing in the Hudson River: State of Knowledge, Research Needs and Future Directions*. New York, August 2005.
- Orton, P.M. Inverse Methods, Mass Conservation, and Multi-Class Suspended Particle Dynamics. Invited seminar at University of Massachusetts, Dartmouth. Also given at MIT/WHOI and Lamont-Doherty Earth Observatory, Feb. 2004.
- Orton, P.M., Jay, D.A., and Chisholm, T.A. Multi-class sediment dynamics and export in the Fraser River estuary. The Estuarine Research Federation Annual Conference, Seattle, Sept. 2003.
- Orton, P.M., What is global warming, and should we be concerned? Interviewed by skeptical libertarian radio host Victor Bock, KPAM radio 860AM, July 8, 2001.

OTHER PUBLICATIONS

- Higinbotham, J.R., Moisan, J. and Orton, P. 2009. Solar Powered Autonomous Surface Vehicle Development and Operation. *Sea Technology* 50(7).
- Orton, P., O'Mullan, G., McGillis, W., Sambrotto, R., and Mailloux, B., Sniffing out the Truth, *New York Times Sunday Edition*, Opinions Section, January 21, 2007.
- Orton, P.M., Energy crisis much broader than perceived, *The Oregonian*, Editorial Section, January 29, 2001.
- Schwing, F.B., Orton, P.M., Jay, D.A., Batchelder, H. and Rosenfeld, L.K. 1999. Conference explores El Nino's relationship to the Northeast Pacific. *EOS: Transactions, American Geophysical Union*, 80(11):122.