

Heidi L. Fuchs

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EDUCATION

- 2005 **Ph.D., MIT & Woods Hole Oceanographic Institution**, Biological Oceanography
Thesis: “Biophysical coupling between turbulence, veliger behavior, and larval supply”
1999 **B.S., University of Wyoming**, Zoology
1990 **B.S., University of Wisconsin - Madison**, Art

APPOINTMENTS

- 2008–present **Assistant Professor**, Rutgers Institute of Marine and Coastal Sciences
2007–2010 **Guest Investigator**, Woods Hole Oceanographic Institution
2005–2008 **Postdoctoral Scholar**, Scripps Institution of Oceanography, U.C.–San Diego
1999–2005 **Graduate Research Fellow**, Woods Hole Oceanographic Institution

RESEARCH INTERESTS

Larval dispersal and settlement; Larval responses to hydrodynamic cues; Statistical models for quantifying larval behavior in flow; Population connectivity; Dispersal of invasive species; Plankton trophic dynamics; Effects of climate change on plankton communities; Planktonic ecosystem modeling; Coupled biological-physical models

PUBLICATIONS

- H.L. Fuchs** and C. DiBacco. 2011. Mussel larval responses to turbulence are unaltered by larval age or light conditions. *Limnology & Oceanography: Fluids & Environments*, 1:120-134.
- C. DiBacco, **H.L. Fuchs**, J. Pineda, and K. Helfrich. 2011. Swimming behavior and velocities of barnacle cyprids in a downwelling flume. *Marine Ecology Progress Series*, 433:131-148.
- H.L. Fuchs**, A.R. Solow, and L.S. Mullineaux. 2010. Larval responses to turbulence and temperature in a tidal inlet: Habitat selection by dispersing gastropods? *Journal of Marine Research* 68(1):153-188.
- H.L. Fuchs** and P.J.S. Franks. 2010. Plankton community properties determined by nutrients and size-selective feeding. *Marine Ecology Progress Series* 413:1-15 (Feature Article).
- H.L. Fuchs**, M.G. Neubert, and L.S. Mullineaux. 2007. Effects of turbulence-mediated larval behavior on larval supply and settlement in tidal currents. *Limnology & Oceanography* 52:1156-1165.

H.L. Fuchs, L.S. Mullineaux, and A.R. Solow. 2004. Sinking behavior of gastropod larvae (*Ilyanassa obsoleta*) in turbulence. *Limnology & Oceanography* 49:1937-1948.

F.J. Tapia, J.Pineda, F.J. Ocampo-Torres, **H.L. Fuchs**, E. Parnell, P. Montero, and S. Ramos. 2004. High-frequency observations of wind-forced onshore transport at a coastal site in Baja California. *Continental Shelf Research* 24:1573-1585.

GRANTS

- 2012 Rutgers Faculty Research Grant, PI: **H.L. Fuchs** (\$22,307)
- 2011-2012 NJDEP, “Multi-trophic level modeling of Barnegat Bay”
PIs: O.P. Jensen and **H.L. Fuchs** (\$124,881)
- 2011-2015 NSF, “Relative influence of turbulence and waves on larval behavior”
PIs: **H.L. Fuchs**, G.P. Gerbi, and F.J. Diez (\$645,439)
- 2009-2011 NSF, “RAPID: Role of ephemeral bottom roughness patches in unpredictable recruitment of surfclams on the continental shelf”
PIs: C.M. Fuller, P. Ramey, J.P. Grassle, G.L. Taghon, and **H.L. Fuchs** (\$99,989)
- 2008-2010 WHOI Coastal Ocean Institute, “Simultaneous measurement of larval behavior and turbulence in the laboratory”
PIs: L.S. Mullineaux, K.R. Helfrich, and **H.L. Fuchs** (\$62,782)
- 2007-2010 Woods Hole Sea Grant, “Characterization of the behavior of mussel larvae in turbulence and downwelling flow”
PIs: **H.L. Fuchs**, C. DiBacco, and L.S. Mullineaux (\$23,967)
- 2006-2008 WHOI Coastal Ocean Institute, “Construction of a double-grid turbulence tank for larval behavior studies” PIs: L.S. Mullineaux and **H.L. Fuchs** (\$35,762)
- 2003-2005 WHOI Coastal Ocean Institute, “Temporal variation in larval supply relative to turbulence in a tidal inlet” PIs: **H.L. Fuchs** and L.S. Mullineaux (\$44,354)
- 2003-2004 Woods Hole Sea Grant New Initiative grant (\$2,500)
- 2003 Rinehart Coastal Research Center grant (\$2,000)
- 2000-2004 MIT & WHOI, 8 research and travel awards (\$4,485)

FELLOWSHIPS AND AWARDS

- 1999-2002 National Science Foundation Graduate Research Fellowship
- 1998 Summer Student Fellowship, Woods Hole Oceanographic Institution
- 1998 Phi Kappa Phi Honor Society, University of Wyoming chapter
- 1997-1998 Mr. and Mrs. Harold DeWitt Scholarship (2 awards), University of Wyoming
- 1990 Golden Key National Honor Society, University of Wisconsin chapter
- 1989 Edith L. Gilbertson Scholarship, Art Department, University of Wisconsin
- 1986 Kemper K. Knapp Merit Scholarship, University of Wisconsin

WORKSHOP PARTICIPATION

2008 Size-Structured Modeling Workshop, Woods Hole Oceanographic Institution
2000-2002 WHOI Mathematical Ecology Retreats, Nantucket, MA

CRUISES

2002–2004 **Principal Investigator**, 17 day-cruises, MA coast, RV's Tioga, Mytilus, Calanus.
Biological and physical measurements for thesis research.
2000–2001 **Research Assistant**, 2 cruises, Chile to Antarctica, ARSV L. M. Gould. Plankton
and dredge sampling; larval photography. *PI's*: R. Scheltema and K. Halanych
1999 **Research Assistant**, 10 day-cruises, Ensenada, Mexico to Bahia Salsipuedes
Tracked drifters and sampled larvae to study onshore transport. *PI*: J. Pineda
1999 **Education Cruise**, 10-day sail, Woods Hole to Sargasso Sea, SSV Corwith Cramer

TEACHING ACTIVITIES

GRADUATE COURSES

16:712:604 Numerical Modeling of Coupled Systems, co-instructor, spring 2010
16:712:606 Graduate Oceanography Seminar, resource faculty member, spring 2009, 2010, 2011

UNDERGRADUATE COURSES

11:628:410 Biophysical Interactions: From Barnacles to Jellyfish, spring 2012
11:628:320 Dynamics of Marine Ecosystems, co-instructor, fall 2009, 2010, 2011
11:628:462 Ocean Ecology, 2 guest lectures, spring 2009
11:628:497 Independent study, summer 2009, spring 2011
11:554:398 Honors tutorial, spring 2011

CURRICULUM DEVELOPMENT

2012 Spring Developed new course on Biophysical Interactions (11:628:410)
2010 Spring Re-designed biological component of Numerical Modeling of Coupled Systems
(16:712:604) for graduate students in Oceanography
2009 Fall Re-designed biological component of Dynamics of Marine Ecosystems (11:628:320),
a required class for undergraduate Marine Science majors

OTHER

1998–1999 Tutor, math and chemistry, University of Wyoming Athletic Department
1998 Teaching Assistant, general biology, University of Wyoming
1987–1988 Private Tutor, business calculus, University of Wisconsin

ADVISING AND MENTORING

PRIMARY ADVISOR

M.S. current Kevin Crum, Graduate Program in Oceanography, Rutgers

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THESIS COMMITTEE MEMBER

- M.S. current Jamie Caridad-Sta. Romana, Ecology and Evolution Graduate Program, Rutgers
M.S. current Michael Garzio, Ecology and Evolution Graduate Program, Rutgers
M.S. 2011 Laura Palamara, Graduate Program in Oceanography, Rutgers

UNDERGRADUATE RESEARCH

- 2011 Jason Sadowski (honors tutorial; 11:554:398), “Modeling invasions of planktonic predators in a size-structured ecosystem”
2011 Regina Guazzo (independent study; 11:628:498), “The effects of algae on oyster larvae swimming behavior”
2010 Erika Schmitt (NSF/Research Internship in Ocean Sciences), “*Crassostrea virginica* larval interactions with synthetic and algal particles”, RIOS poster award 2nd place
2009 Katherine Douglas (independent study; 11:628:497, 11:628:498), “The responses of young and old *Mytilus edulis* larvae to light and turbulence”
2009 Charlene Smith (work study), trained in sorting plankton samples, Rutgers
2004 Michael Workman (guest student, Woods Hole Oceanographic Institution)
2004 Lynne Davies (guest student, Woods Hole Oceanographic Institution)
2002 Yuri Yamashita (guest student, Woods Hole Oceanographic Institution)

UNDERGRADUATE ACADEMIC

- 2011-2012 Reviewer for Jason Sadowski, George H. Cook Honors Thesis
2009-present Academic advisor for Marine Science majors (~3 per year)

SERVICE

RESEARCH COMMUNITY

- 2012 Poster judge, Ocean Sciences meeting, Salt Lake City, UT
2011 NSF site visit team member, Center for Coastal Margin Observation and Prediction
2011 Session co-organizer, “The Diverse Role of Meroplankton in the Biology and Ecology of Marine Systems,” 5th International Zooplankton Production Symposium, Pucón, Chile

Manuscript Reviews: Limnology & Oceanography, Progress in Oceanography, Journal of Geophysical Research - Oceans, Continental Shelf Research, Marine Ecology Progress Series, Journal of Experimental Biology, Aquatic Biology, Deep-Sea Research II, Marine Biology, Journal of Plankton Research, Limnology & Oceanography: Fluids & Environments, Environmental Fluid Mechanics

Proposal Reviews: NSF (Biological Oceanography, Major Research Instrumentation, Organism – Environment Interactions), DFG - German Research Foundation

Book Reviews: Prentice Hall

Professional Memberships: American Society of Limnology and Oceanography,
American Geophysical Union

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UNIVERSITY

- 2009-present Member of Ecology and Evolution Graduate Program
2008-present Member of the Graduate Program of Oceanography

DEPARTMENT

- 2011 Subcommittee member, position descriptions for future IMCS faculty hires
2011 Panelist for round-table discussion with graduate students and RIOS interns
2009-present Committee member, Oceanography graduate admissions
2009 Committee member, IMCS Outstanding Senior Award
2009 Presented research overview to IMCS Advisory Board
2009 Poster Judge for IMCS Research Internships in Ocean Sciences program

OTHER

- 2009 Interviewee for Rutgers Women's Leadership course
2003-2005 Founder and co-organizer of Woods Hole weekly Redfield Movie series
2002 Co-organizer of WHOI turbulence reading and discussion group
2001 Science fair judge for Falmouth Academy, Falmouth, MA

PRESENTATIONS

INVITED TALKS

- 2009 **H.L. Fuchs.** Plankton community properties determined by nutrients and size-selective feeding. Ecology and Evolution seminar. Rutgers, New Brunswick, NJ
2008 **H.L. Fuchs.** Responses of snail larvae to turbulence in a tidal inlet, and implications for dispersal. Joint PO/BO seminar. Oregon State University, Corvallis, OR
2007 **H.L. Fuchs.** Larval divebombing in turbulence: Implications for dispersal and recruitment of coastal molluscs. Rutgers Institute of Marine & Coastal Sciences, New Brunswick, NJ
2006 **H.L. Fuchs,** A. R. Solow, and L. S. Mullineaux. Larval responses to turbulence and temperature in a tidal inlet. 7th Larval Biology Symposium, Coos Bay, OR
2006 **H.L. Fuchs.** Biophysical coupling between turbulence, veliger behavior, and larval supply. Ecology seminar. Scripps Institution of Oceanography, La Jolla, CA
2004 **H.L. Fuchs.** Sinking behavior of gastropod larvae (*Ilyanassa obsoleta*) in grid-stirred turbulence. Biology seminar. Woods Hole Oceanographic Institution, Woods Hole, MA

CONTRIBUTED TALKS

- 2012 **H.L. Fuchs** and M.A. Reidenbach. Turbulence-induced sinking and substrate type impact settlement patterns of oyster larvae. Ocean Sciences, Salt Lake City, UT
2011 **H.L. Fuchs.** Emerging patterns of thresholds in plankton responses to turbulence. Aspen Ocean Symposium, Aspen, CO
2011 C. DiBacco, **H. Fuchs,** J. Pineda, and K. Helfrich. Assessing swimming behavior and velocities of barnacle larvae in a downwelling flume. 5th International Zooplankton Production Symposium, Pucón, Chile
2010 **H.L. Fuchs** and J.A. Lerczak. Species-specific larval responses to turbulence affect retention time in a tidal inlet. 9th International Larval Biology Symposium, Wellington, New Zealand

- 2010 **H.L. Fuchs** and P.J.S. Franks. Defining effects of zooplankton assemblage on plankton community properties. Ocean Sciences, Portland, OR
- 2008 **H.L. Fuchs**. How do changes in zooplankton community affect plankton size structure? Workshop on Size-Structured Models, Woods Hole, MA
- 2007 **H.L. Fuchs**, M.G. Neubert, and L.S. Mullineaux. Effects of turbulence-mediated larval behavior on larval supply and settlement in tidal currents. American Society of Limnology and Oceanography, Santa Fe, NM
- 2007 C. DiBacco, J. Pineda, **H.L. Fuchs**, and K. Helfrich. Development and application of a downwelling flume to assess vertical swimming velocities and behaviors of meroplankton. Talk. American Society of Limnology and Oceanography, Santa Fe, NM
- 2005 **H.L. Fuchs**, L.S. Mullineaux, M.G. Neubert, and A.R. Solow. Larval responses to turbulence: estimates from larval distributions in a tidal channel. American Society of Limnology and Oceanography, Santiago de Compostela, Spain
- 2004 **H.L. Fuchs**, L.S. Mullineaux, and A.R. Solow. Sinking behavior of gastropod larvae (*Ilyanassa obsoleta*) in grid-stirred turbulence. American Society of Limnology and Oceanography, Honolulu, HI

POSTERS

- 2011 C.M. Fuller, R.F. Petrecca, P.A. Ramey, G.L. Taghon, J.P. Grassle, and **H.L. Fuchs**. Role of bottom roughness in recruitment and survival of surfclams, *Spisula solidissima*, on the New Jersey continental shelf. American Society of Limnology and Oceanography, San Juan, Puerto Rico.
- 2007 **H.L. Fuchs** and P. Franks. Size-selective feeding drives plankton community structure. Ecological Society of America Meeting, San Jose, CA
- 2007 **H.L. Fuchs** and P. Franks. Size-selective feeding drives plankton community structure. NSF site review, Scripps Institution of Oceanography, San Diego, CA
- 2006 **H.L. Fuchs** and P. Franks. A new continuum model for planktonic ecosystems. LTER All Scientists Meeting, Estes Park, CO
- 2002 **H.L. Fuchs**, L.S. Mullineaux, and S.P. McKenna. Sinking behavior of gastropod veligers in response to oscillating grid-generated turbulence. American Society of Limnology and Oceanography, Victoria, BC, Canada
- 2000 **H.L. Fuchs**. A qualitative study of planktonic benthic invertebrate larvae in Vineyard Sound (MA). 4th International Larval Biology Meeting, Santa Cruz, CA