# PHILIP OWEN YUND

The Downeast Institute
39 Wildflower Lane
P.O. Box 83
Beals, ME 04611

(207) 712-6085
pyund@downeastinstitute.org

## EDUCATION

| | | |
|---|---|---|
| 1987 | Ph.D., Biology | Yale University, New Haven, CT. |
| 1985 | M. Phil., Biology | Yale University, New Haven, CT. |
| 1982 | Sc.B., Aquatic Biology | Brown University, Providence, RI. |

## PROFESSIONAL POSITIONS

| | |
|---|---|
| 2012 – present | Senior Scientist, The Downeast Institute. |
| 2008 - 2012 | Director, Center for Land-Sea Interactions, University of New England. |
| 2004 - 2012 | Director, Marine Science Center, University of New England. |
| 2001 - 2003 | Assoc. Program Director, National Science Foundation (Bio. Oce.). |
| 1997 - 2004 | Research Associate Professor, University of Maine. |
| 1995 - 1997 | Associate Professor (with tenure), University of New Orleans. |
| 1990 - 1995 | Assistant Professor, University of New Orleans. |
| 1988 - 1990 | Adjunct Assistant Professor, Brown University. |
| 1987 - 1988 | Postdoctoral Research Associate, Brown University. |
| 1985 - 1986 | Short-term Fellow, Smithsonian Tropical Research Institute. |

## REFEREED JOURNAL ARTICLES (student and post-doc co-authors are underlined, **undergrads in bold**)

Thomas, F.I.M., Kregting, L., Grabowski, R.C., Brian D. Badgley, Megan J. Donahue, and P.O. Yund. 2013. Fertilization in free-spawning invertebrates is not only a water column process: Effects of water flow on location. Mar. Ecol. Prog. Ser., in press.

Annis, E.R., R. Russell, C.J. Wilson, and P.O. Yund. 2013. Evidence for thermally mediated settlement in lobster larvae *Homarus americanus*. Can. J. Fish. Aquat. Sci.70:1641-1649. DOI 10.1139/cjfas-2013-0060.

Kregting, L.T., Bass, A.L, Guadyol, Ò, Yund, P.O, and F.I.M. Thomas. 2013. Effects of oscillatory flow on fertilization in the Green Sea Urchin *Strongylocentrotus droebachiensis*. PLoS One 8(9):e76082. DOI 10.1371/journal.pone.0076082.

Wallace, C.C., Yund, P.O., Matassa, K.A., Ford, T.E., and A.L. Bass. 2013. Increase in antibiotic resistance in bacteria cultured from stranded marine animals of the Northwest Atlantic. EcoHealth 10:201-210. DOI 10.1007/s10393-013-0842-6.

Tilburg, C.E., McCartney, M.A., and P.O. Yund. 2012. Across-shelf transport of bivalve larvae: Can the interface between a coastal current and inshore waters act as an ecological barrier to larval dispersal? PLoS One 7(11):e48960. DOI 10.1371/journal.pone.0048960.

Gloria-Soria, A., M.A. Moreno, P.O. Yund, F.G. Lakkis, L.W. Buss, and S.L. Dellaporta. 2012. Evolutionary genetics of the hydroid allodeterminant *alr2*. Mol. Biol. Evol. 29:3921-3932. DOI 10.1093/molbev/mss197.

Bass, A.L., Wallace, C.W., Yund, P.O., and T.E. Ford. 2012. Detection of *Cryptosporidium* sp. seal in two new seal species, *Phoca vitulina* and *Cystophora cristata* and a novel Cryptosporidium genotype in a third seal species, *Pagophilus groenlandicus* from the Gulf of Maine. J. Parasitology 98:316-322.

**REFEREED JOURNAL ARTICLES** (continued)

Tilburg, C.E., Gill, S.M., Zeeman, S.I., **Carlson, A.E.**, Arienti, T.W., **Eickhorst, J.A.,** and P.O. Yund. 2011. Characteristics of a shallow river plume: Observations from the Saco River Coastal Observing System. Estuaries & Coasts 34:785-799.

Grabowski, J.H., Clesceri, E.J., Baukus, A., Gaudette, J., Weber, M., and P.O.Yund. 2010. Use of herring bait to farm lobsters in the Gulf of Maine. PLoS ONE 5(4):e10188. DOI 10.1371/journal.pone.0010188.

Johnson, S.L., and P.O. Yund. 2009. Effect of fertilization distance on male gain curves in a free-spawning marine invertebrate: A combined empirical and theoretical approach. Evolution 63:3114-3123. DOI 10.1111/j.1558-5646.2009.00784.x

Grabowski, J.H., Gaudette, J., Clesceri, E.J., and P. O. Yund. 2009. The role of food limitation in lobster population dynamics in coastal Maine, United States, and New Brunswick, Canada. New Zealand J. Mar. Fresh. Res. 43:185-193.

Smith, M.D., Grabowski, J. H., and P.O. Yund. 2008. The role of closed areas in rebuilding monkfish populations in the Gulf of Maine. ICES J. Mar. Sci. 65:1326-1333. DOI 10.1093/icesjms/fsn137

Johnson, S.L., and P.O. Yund. 2008. Multiple paternity and subsequent fusion/rejection interactions in a kin-structured population. Mar. Ecol. Prog. Ser. 364:129-134.

Slaughter, C., McCartney, M.A., and P.O. Yund. 2007. A comparison of gamete compatibility between blue mussel species in sympatry and in allopatry. Biol. Bull. 213:267-273.

Johnson, S., and P.O. Yund. 2007. Variation in multiple paternity in natural populations of a free-spawning marine invertebrate. Mol. Ecol. 16:3253-3262.

Yund, P.O., **Murdock, K.,** and S.L, Johnson. 2007. Spatial distribution of ascidian sperm: Two dimensional patterns and short vs. time-integrated assays. Mar. Ecol. Prog. Ser. 341:103-109.

Rawson, P.D., Yund, P.O., and S.M. Lindsay. 2007. Comment on "Divergent induced responses to an invasive predator in marine mussel populations". Science 316:53; www.sciencemag.org/cgi/content/full/316/5821/53b.

Johnson, S., and P.O. Yund. 2004. Exceptional sperm longevity in a free-spawning colonial ascidian. Biol. Bull. 206:144-151.

Phillippi, A., **Hamann, E.**, and P.O. Yund. 2004. Fertilization in an egg-brooding colonial ascidian does not vary with population density. Biol. Bull. 206:152-160.

Yund, P.O., and S.K. Meidel. 2003. Sea urchin spawning in benthic boundary layers: Are eggs fertilized before advecting away from females? Limnol. Oceanogr. 48:795-801.

Rawson, P.D., **Slaughter, C.**, and P.O. Yund. 2003. Patterns of gametic incompatibility between the blue mussels *Mytilus edulis* and *M. trossulus.* Mar. Biol. 143:317-325.

Newlon, A.W. III, Yund, P.O., and J. Stewart-Savage. 2003. Phenotypic plasticity of male, female, and asexual reproduction in a colonial ascidian, *Botryllus schlosseri.* J. Exp. Zool. 297A:180-188.

Yund, P.O., and **A. Stires**. 2002. Spatial variation in population dynamics in a colonial ascidian (*Botryllus schlosseri*). Mar. Biol. 141:955-963.

Meidel, S.K., and P.O. Yund. 2001. Egg longevity and time-integrated fertilization in a temperate sea urchin (*Strongylocentrotus droebachiensis*). Biol. Bull. 201:84-94.

**REFEREED JOURNAL ARTICLES** (continued)

Stewart-Savage, J., Phillippi, A., and P.O. Yund. 2001. Delayed insemination results in embryo mortality in a brooding ascidian. Biol. Bull. 201:52-58.

Yund, P.O. 2000. How severe is sperm limitation in natural populations of marine free-spawners? Trends Ecol. Evol. 15:10-13.

Yund, P.O., and P.G. O'Neil. 2000. Microgeographic genetic differentiation in a colonial ascidian (*Botryllus schlosseri*) population. Mar. Biol. 137:583-588.

Leonard, G.H., Bertness, M.D., and P.O. Yund. 1999. Crab predation, water-borne cues and inducible defenses in the blue mussel, *Mytilus edulis.* Ecology 80:1-14.

Stewart-Savage, J., **Wagstaff, B.J.**, and P.O. Yund. 1999. The developmental basis of phenotypic variation in egg production in a colonial ascidian: Primary oocyte production versus oocyte development. Biol. Bull. 196:63-69.

Folino, N. and P.O. Yund. 1998. The distribution of *Hydractinia* sibling species on hermit crabs in estuaries in the Gulf of Maine. Estuaries 21:829-836.

Yund, P.O. 1998. The effect of sperm competition on male gain curves in a colonial marine invertebrate. Ecology 79:328-339.

Stewart-Savage, J. and P.O. Yund. 1997. Temporal pattern of sperm release from the colonial ascidian, *Botryllus schlosseri.* J. Exp. Zool. 279:620-625.

Yund, P.O., **Marcum, Y.**, and J. Stewart-Savage. 1997. Life history variation in a colonial ascidian: Broad-sense heritabilities and tradeoffs between growth and allocation to male and female reproduction. Biol. Bull. 192:290-299.

Atkinson, O.S. and P.O. Yund. 1996. The effect of variation in population density on male fertilization success in a colonial ascidian. J. Exp. Mar. Biol. Ecol. 195:111-123.

Yund, P.O. 1995. Gene flow via the dispersal of fertilizing sperm in a colonial ascidian (*Botryllus schlosseri*): The effect of male density. Mar. Biol. 122:649-654.

Fleeger, J.W., Yund, P.O., and B. Sun. 1995. Active and passive processes associated with initial settlement and post-settlement dispersal of suspended meiobenthic copepods. J. Mar. Res. 53:609-645.

Yund, P.O. and M.A. McCartney. 1994. Male reproductive success in colonial invertebrates: Competition for fertilizations. Ecology 75:2151-2167.

Yund, P.O. and **M. Feldgarden**. 1992. Rapid proliferation of historecognition alleles in populations of a colonial ascidian. J. Exp. Zool. 263:442-452.

Bertness, M.D., Gaines, S.D., **Stephens, E.**, and P.O. Yund. 1992. Components of recruitment in populations of the acorn barnacle, *Semibalanus balanoides.* J. Exp. Mar. Biol. Ecol. 156:199-215.

Yund, P.O. and **M. Feldgarden**. 1992. To thine own self be true? Yes! Thou canst not then be false to any other. A reply to Grosberg. Biol. Bull. 182:458-459.

**Feldgarden, M.** and P.O. Yund. 1992. The evolution of allorecognition in colonial marine invertebrates: Does selection favor fusion with kin, or fusion with self? Biol. Bull. 182:155-158.

Yund, P.O. 1991. Natural selection on hydroid colony morphology by intraspecific competition. Evolution 45:1564-1573.

**REFEREED JOURNAL ARTICLES** (continued)

Yund, P.O., Gaines, S.D., and M.D. Bertness. 1991. Cylindrical tube traps for larval sampling. Limnol. Oceanogr. 36:1167-1177.

Yund, P.O. 1990. An *in situ* measurement of sperm dispersal in a colonial marine hydroid. J. Exp. Zool. 253:102-106.

Yund, P.O. and **H.M. Parker.** 1989. Population structure of the colonial hydroid *Hydractinia* sp. nov. C in the Gulf of Maine. J. Exp. Mar. Biol. Ecol. 125:63-82.

Blackstone, N.W. and P.O. Yund. 1989. Morphological variation in a colonial marine hydroid: a comparison of size-based and age-based heterochrony. Paleobiology 15:1-10.

Buss, L.W. and P.O. Yund. 1989. A sibling species group of *Hydractinia* in the Northeastern United States. J. Mar. Biol. Assoc. (UK) 69:857-874.

Buss, L.W. and P.O. Yund. 1988. A comparison of recent and historical populations of the colonial hydroid *Hydractinia*. Ecology 69:646-654.

Yund, P.O., **Cunningham, C.W.** and L.W. Buss. 1987. Recruitment and post-recruitment interactions in a colonial hydroid. Ecology 68:971-982.

Bertness, M.D., Yund, P.O., and A.F. Brown. 1983. Snail grazing and the abundance of algal crusts on a sheltered New England rocky beach. J. Exp. Mar. Biol. Ecol. 71:147-164.

Doyle, W.L., Kidder, G.W., and P.O. Yund. 1981. The MDIBL seawater system: some characteristics and data. Bull. Mount Desert Isl. Biol. Lab. 20:42-47.

**TECHNICAL REPORTS AND BOOK CHAPTERS**

Michaels, W.L., and P. Yund. 2001. Report on the Third Northwest Atlantic Herring Acoustic Workshop, University of Maine Darling Marine Center, Walpole, Maine, March 13-14, 2001. NOAA Technical Memorandum NMFS-NE-166, 18 pages.

Stewart-Savage, J., **Stires, A.**, and P.O. Yund. 2001. Environmental effect on the reproductive output of *Botryllus schlosseri.* Pp. 311-314 in: (H. Sawada, H. Yokosama, and C.C. Lambert, eds) Biology of Ascidians. Springer-Verlag, Tokyo.

Yund, P.O. 1999. Fishing vessel acoustic survey of Gulf of Maine herring. Gulf of Maine Aquarium, Portland, Maine.

S.P. Powers, M.A. Poirrier, and P.O. Yund. 1992. Effects of urban runoff on the environmental quality of Lake Pontchartrain. Sub-project: Effects of New Orleans runoff on the benthic community of Southern Lake Pontchartrain, La. Research Report No. 92-05, Urban Waste Management and Research Center, University of New Orleans.

**TEXTS**

Yund, P.O., O'Neil, P.G., and J. Howard. 1993, revised 1994, 1995. Population Genetics, Ecology, & Evolution Lab Manual. McGraw-Hill, Dubuque, IA. ISBN 0-697-27246-X, 132 pages.

O'Neil, P., K. Kandl, P. Yund, and J. Howard. 2001, 2003. Population Genetics, Ecology, & Evolution Laboratory Manual. McGraw –Hill, Dubuque, IA.

**FUNDING HISTORY** (Excluding grants obtained while in graduate school)

2013 NSF (Bio. Oce.), "Collaborative Research: An integrated theoretical and empirical approach to across-shelf mixing and connectivity of mussel populations", $394,730 for four years. Companion awards of $353,436 to R. Etter and R. Hannigan (UMass-Boston) and $306,015 to H. Xue (UMaine).

2011 NSF, "MRI: Acquisition of a scanning spectral confocal microscope for multidisciplinary research, teaching and outreach", $433,938 for three years; with T.E. Ford, D.J. Small, G. Ganter, and J. Vesenka.

2011 NSF (Bio. Oce.), ROA supplement to the following award, $33,954. Funded the participation of Dr. Eric Anis (Hood College) and expanded sampling to lobster larvae.

2010 NSF (Bio. Oce.), "Collaborative Research: Does larval transport or physiological tolerance set the southern range boundary of a northern blue mussel?", $431,709 for 3 years; with C. Tilburg. Companion award of $223,257 to M. McCartney (UNC-Wilmington).

2009 Elmina B. Sewall Foundation, "Pathogen transfer between terrestrial and marine hosts", $50,000 for one year.

2006 Maine Technology Institute, "A coastal observing system for Saco Bay", $499,927 for five years; with S. Zeeman.

2004 NSF (Bio. Oce.), "Collaborative research: Fertilization in free-spawners – interaction of gamete properties and hydrodynamic regime", $327,976 for four years. Companion award of $298,835 to F. Thomas (U. Hawaii).

2003 National Marine Fisheries Service (Cooperative Research Partners Initiative); "Identification of juvenile groundfish habitat within nearshore waters of the Gulf of Maine", $251,607 for 18 months; with J. Grabowski.

2002 Maine Dept. Marine Resources; "A tagging study to determine herring movement patterns in the Gulf of Maine", $20,000 for two years.

2001 NSF (Bio. Oce.), "Determinants of male reproductive success in natural spawns", $335,739 for four years; with P. Rawson.

2001 Northeast Consortium; "Are we farming lobsters? The effect of herring bait on lobster growth", $111,972 for one year; with J. Grabowski, E. Clesceri, and C. Wilson.

2000 Maine Science and Technology Foundation; "Hydroacoustic survey of the coastal spawning component of the Gulf of Maine herring stock", $71,050 for one year; with D. Perkins.

2000 Northeast Consortium; "Groundfishing vessel survey of herring spawning areas", $70,000 for one year; with D. Perkins, C. McClellan.

2000 Maine Dept. Marine Resources; "Using microsatellites to distinguish breeding populations of Atlantic herring in the Gulf of Maine", $20,061 for one year.

1999 NSF (Ocean Education), REU site grant; "Summer undergraduate research fellowships at the Darling Marine Center", $74,654 for two years.

1999 Gulf of Maine Aquarium, "Collaborative project to assess Gulf of Maine herring stocks", $33,267 for one year.

1998 NSF (Bio. Oce. and Pop. Bio.), "The effect of sperm competition on levels of sperm production in a marine invertebrate", $285,000 for 3 years.

**FUNDING HISTORY** (Continued)

1994 NSF (Bio. Oce. and Pop. Bio.), "The effect of in situ fertilization processes on the relationship between gamete production and reproductive success", $196,950 for 3.5 years.

1992 NSF (Bio. Oce.), "Variation in the dispersal of fertilizing sperm as a function of population density", $93,560 for 2.5 years, plus $5,000 REU supplement.

1991 EPA, "Effects of urban runoff on the environmental quality of Lake Pontchartrain, Louisiana", $109,890 for 1 year; with M. Poirrier, J. Francis, and K. Preston.

1991 NSF/LaSER (EPSCOR), "Understanding interactions between biological communities and depositional processes in coastal marsh environments", $74,520 for 20 months, plus $4,000 REU supplement; with D. Reed, J. Fleeger, and K. Carman.

1989 NSF (Bio. Oce.), "Evolutionary consequences of variable recruitment in a colonial hydroid", $74,946 for 2.5 years.

**TEACHING EXPERIENCE**

| | |
|---|---|
| University of New England<br>1 semester | **Land-Sea Interactions.** Graduate course that explores diverse aspects of land-sea interactions. |
| University of New England<br>1 semester | **Fish Ecology.** Graduate course emphasizing current areas of research in fish ecology. |
| University of New England<br>1 semester | **Scientific Writing.** Junior level writing section offered as a "writing intensive" option in conjunction with another course. |
| University of Maine<br>1 semester | **Semester by the Sea; Undergraduate Seminar.** An introduction to reading, critiquing, and interpreting primary scientific literature that integrates material from other courses in the Semester by the Sea program. |
| University of Maine<br>1 semester | **Coastal Marine Ecology.** Intensive, week-long field course designed to introduce juniors and seniors to marine ecology in the Gulf of Maine. |
| University of New Orleans<br>8 semesters | **Population Genetics, Ecology, and Evolution.** Sophomore course providing a broad introduction to the three fields. Laboratory exercises involve manipulative experiments and computer simulations. |
| University of New Orleans<br>4 semesters | **General Ecology.** Junior level course focused on population and community ecology. |
| University of New Orleans<br>1 semester | **Field Biology.** Junior/senior level course introducing students to field experimentation in ecology and evolutionary biology. |
| University of New Orleans<br>2 semesters | **Advanced Ecology.** Graduate course emphasizing current areas of research in ecology and evolutionary biology. |
| Brown University<br>2 semesters | **Evolutionary Biology.** Sophomore level course organized around a hierarchical approach to studying evolution. |
| Brown University<br>1 semester | **Hierarchy in Evolution.** Seminar course for graduate students and advanced undergraduates. |
| Brown University<br>1 semester | **Marine Ecology.** Summer course for high school teachers. |

## STUDENTS AND POSTDOCS

45 undergraduate research assistants (15 male and 30 female; 12 are co-authors on published papers; 12 subsequently enrolled in MS programs and 12 in PhD programs).

MS: Erin Wilkinson, 2013, Kylie Bloodsworth, 2013, Elizabeth Prochaska, 2014 (anticipated), Charlotte Regula, 2011; Melissa Smith, 2006; J. Kohl Kanwit, 2005; O. Scott Atkinson, 1994; Edward Haywood, 1993.

PhD: Aimee Phillippi, 2005; Sheri Johnson, 2007; LeAnn Conlon (joint w/ Huijie Xue), 2017 (expected).

Postdoctoral: Susanne Meidel, 1999-2001; Jon Grabowski, 2002-2003; Jin Hwan Hwang, 2004-2005; Louise Kregting, 2006-2007; Anna Bass, 2008-2009 & 2010-2011.

## PROPOSAL AND MANUSCRIPT REVIEW

National Science Foundation
Ecology/Ecological Monographs
Evolution
American Naturalist
Proceedings of the Royal Society of London
Bulletin of Marine Science
Israel Science Foundation
Journal of Experimental Zoology
Nature
Marine Biology
Marine Ecology Progress Series
Biological Bulletin (editorial board since 2004, assoc. editor since 2013)

## PROFESSIONAL SOCIETIES AND HONORS

Ecological Society of America, Society for the Study of Evolution, Society for Integrative and Comparative Biology.

John Spangler Nicholas Prize for the outstanding dissertation in experimental zoology, Yale University, 1987.

## ORAL PRESENTATIONS

INVITED SEMINARS

**University of Maine,** Orono, Maine, 2013
**University of Maine,** Orono, Maine, 2008
**Bowdoin College**, Brunswick, Maine, 2008.
**University of Massachusetts – Boston**, Boston, Massachusetts, 2007.
**Bates College,** Lewiston, Maine, 2006.
**Mount Desert Island Biological Laboratory**, Salisbury Cove, Maine, 2006.
**Bowdoin College**, Brunswick, Maine, 2005.
**University of New England,** Biddeford, Maine, 2003.
**University of Southern Maine,** Portland, Maine, 2003.
**University of Alaska,** Fairbanks, Alaska, 2000.
**Isle of Shoals Marine Lab**, Isle of Shoals, New Hampshire, 2000.
**Brown University**, Providence, Rhode Island, 1999.
**Dalhousie University**, Halifax, Nova Scotia, 1998.
**SUNY - Purchase**, Purchase, New York, 1997.
**Bigelow Laboratories for Ocean Science**, Boothbay Harbor, Maine, 1997.
**Dauphin Island Sea Lab**, Dauphin Island, Alabama, 1997.
**University of Rhode Island,** Kingston, Rhode Island, 1996.
**University of Maine,** Walpole, Maine, 1996.

INVITED SEMINARS (continued)
**University of New Hampshire**, Durham, New Hampshire, 1995.
**Northeastern University**, Boston, Massachusetts, 1995.
**Tulane University**, New Orleans, Louisiana, 1994.
**University of Houston**, Houston, Texas, 1992.
**University of Massachusetts**, Dartmouth, Massachusetts, 1992.
**Louisiana State University**, Baton Rouge, Louisiana, 1991.
**SUNY - Buffalo,** Buffalo, New York, 1990.
**Northeastern University**, Nahant, Massachusetts, 1989.
**Bowdoin College**, Brunswick, Maine, 1989.

INVITED SYMPOSIA
**Soc. Integrative & Comparative Biology**, Orlando, Florida, 2006.
**Larval Ecology Meetings**, Port Jefferson, New York, 1993.
**Invertebrate Larval Biology Workshop**, Friday Harbor, Washington, 1985.
**ORAL PRESENTATIONS** (Continued)

**Modern Trends in Ecology and Systematics of Hydroids**, Naples, Italy, 1985.

REGIONAL, NATIONAL, AND INTERNATIONAL MEETINGS

| | |
|---|---|
| **Soc. Integrative & Comparative Biology** | Boston, Massachusetts, 2009. |
| | Charleston, South Carolina 2012. |
| **Ecological Society of America** | Providence, Rhode Island, 1996. |
| **Population Biologists of New England** | Amherst, Massachusetts, 1986. |
| | Amherst, Massachusetts, 1984. |
| **Western Society of Naturalists** | Oxnard, California, 2013. |
| | Santa Barbara, California, 1991. |
| | Long Beach, California, 1987. |
| **Benthic Ecology Meetings** | Richmond, Virginia, 2012. |
| | Wilmington, North Carolina, 2010. |
| | Providence, Rhode Island, 2008. |
| | Williamsburg, Virginia, 2005. |
| | Wilmington, North Carolina, 2000. |
| | Columbia, South Carolina, 1996. |
| | Mystic, Connecticut, 1994. |
| | Mobile, Alabama, 1993. |
| | Newport, Rhode Island, 1992. |
| | Mobile, Alabama, 1990. |
| | Portland, Maine, 1988. |
| | Raleigh, North Carolina, 1987. |
| | Boston, Massachusetts, 1986. |