

**CALFED Science Program Technical Review Panel Members
San Francisco Estuary
Sacramento-San Joaquin Delta
Interagency Ecological Program
Pelagic Organism Decline**

For further information please click on the links below:

Dr. Russell A. Moll -- <http://www-csgc.ucsd.edu/STAFF/rusmollbio.html>

Dr. Mark D. Bertness -- <http://www.brown.edu/Departments/EEB/bertness/>

Dr. Stephen M. Bollens -- http://research.wsu.edu/missions_dc/environmental-natural-resources/stephen-bollens.html

Dr. James H. Cowan, Jr. -- <http://www.gulfbase.org/person/view.php?uid=jcowan>

Dr. Ronald T. Kneib -- <http://www.arches.uga.edu/~rtkneib/>

Dr. Parker MacCready -- <http://www.ocean.washington.edu/people/faculty/parker/>

Dr. Paul E. Smith -- <http://swfsc.ucsd.edu/paulsmith/>

Dr. Andrew R. Solow -- <http://www.whoi.edu/scitechdir/staff.go?id=262>

Dr. Robert B. Spies -- <http://www.amarine.com/corporate/staff/staff.html>

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RUSSELL A. MOLL

June 2005

Director, California Sea Grant College Program
University of California, San Diego
9500 Gilman Drive, Dept. 0232.
La Jolla, CA 92093-0232

EDUCATION

BA University of Vermont 1968 - (zoology)
M.S. Long Island University 1971 - (marine sciences)
M.S. University of Michigan 1983 - (biostatistics)
Ph. D. State University of New York at Stony Brook 1974 - (marine biology)

POSITIONS

Director, California Sea Grant College Program (2000--), University of California; Director (1996-2000), Acting Director, Michigan Sea Grant College Program (1996) University of Michigan; Associate Director, University of Michigan Biological Station (1998-2000); Associate Program Director (1994-1996), National Science Foundation; Director (1989-1996), Cooperative Institute for Limnology and Ecosystems Research (CILER); Assistant Director (1988-1993), Acting Assistant Director (1985-1988), Michigan Sea Grant College Program; Associate Research Scientist (1981--), Center for Great Lakes and Aquatic Sciences, University of Michigan; Lecturer (1982), University of Michigan; Assistant Research Scientist (1976-1981), University of Michigan; Research Investigator (1974-1976), University of Michigan

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Association for the Advancement of Science, American Society of Limnology and Oceanography (Treasurer 1996-2002), Estuarine Research Federation, The Oceanographic Society

SELECTED PUBLICATIONS

- Moll, R.A., and M.Z. Brahce. 1986. The seasonal and spatial distribution of bacteria, chlorophyll, and nutrients in nearshore Lake Michigan. *J. Great Lakes Res.* 12: 52-62.
- Healey, M.J., and R.A. Moll. 1988. Abundance and distribution of bacterioplankton in the Gambia River, West Africa. *Microbial Ecology* 16:291-310.
- Moll, R. A., and P. J. Mansfield. 1991. Response of bacteria and phytoplankton to contaminated sediments. *Hydrobiologia* 219:281-299.
- Moll, R.A., A. Bratkovich, W.Y.B. Chang and P. Pu. 1993. Physical, chemical and biological conditions associated with the Lake Michigan vernal thermal front. *Estuaries* 16: 92-103.
- Moll, R., T. Johengen, A. Bratkovich, J. Saylor, G. Meadows, L. Meadows, and G. Pernie. 1993. Vernal thermal fronts in large lakes: A case study from Lake Michigan. *Verh. Internat. Verein. Limnol.* 25:65-68.
- Moll, R. A., D. J. Jude, R. Rossmann, G. Kantak, J. Barres, S. DeBoe, J. Giesy, and M. Tuchman. 1995. Movement and loadings of inorganic contaminants through the lower Saginaw River. *J. Great Lakes Res.* 21(1):17-34.
- Sano, L.L., R.A. Moll, A.K. Krueger and P.F. Landrum. 2003 Assessing the potential of glutaraldehyde for biocide treatment of un-ballasted transoceanic vessels. *J. Great Lakes Res.* 29(4):545-557.

BIOGRAPHICAL SKETCH

MARK D. BERTNESS

Robert P. Brown Professor of Biology
Department of Ecology and Evolutionary Biology
Brown University
Providence, RI 02912

Education

B.S. 1971 University of Puget Sound, Tacoma, WA
M.S. 1975 Western Washington University, Bellingham, WA
Ph.D. 1979 University of Maryland, College Park, MD.

Educational & Research Experience

1977–79 Visiting Scientist, Smithsonian Tropical Research Institute, Panama
1980–92 Assistant – Associate Professor, Brown University
1987–2002 Director, Graduate Program in Ecology and Evolutionary Biology,
1992– Professor, Brown University
2002– Chair, Department of Ecology and Evolutionary Biology, Brown University

Five Representative Publications

Bertness, M. D. 1999. *The Ecology of Atlantic Shorelines*. 465 pages, Sinauer Associates, Sunderland, Massachusetts.

Bertness, M. D., S.D. Gaines, and M. Hay (Editors). 2001. *Marine Community Ecology*. 550 pages, Sinauer Associates, Sunderland, Massachusetts.

Donnelly, J. and M. D. Bertness. 2001. Rapid shoreward encroachment of salt marsh vegetation in response to sea level rise. *Proceedings of the National Academy of Science* 98: 14218-14223.

Bertness, M.D., P. Ewanchuk, and B.R. Silliman. 2002. Anthropogenic modification of New England salt marsh landscapes. *Proceedings of the National Academy of Science* 99 (3): 1395-1398.

Silliman, B.R. and M.D. Bertness. 2002. A trophic cascade regulates salt marsh primary production. *Proceedings of the National Academy of Science* 99 (16): 10500-10505.

Current Synergistic Activities:

Co-Chair, Brown University/MBL (Woods Hole) joint graduate program
Steering Committee, Brown University, Environmental Change Initiative
Scientific Advisor, TNC, Shoreline conservation and management planning group
Advisory Board, Northeastern University Marine Science Center, Nahant
Steering Committee, NSF planning group, Coordinating Research on the Northern Atlantic
Visiting Chair in Ecology, University of Groningen, Holland

Board of Directors, Marine Biological Association, UK

Sponsored Graduate Students (15 total): Aaron Ellison (Ph.D. 1987) Senior Scientist, Harvard Forest, Flo Thomas (M.S. 1987) Associate Professor, University of South Florida, David Hirata (M.S. 1990) Stock Broker, magician, Scott Shumway (Ph.D. 1991) Professor, Wheaton College, Patti Halpin (Ph.D. 1994) Research Associate, University of California, Santa Barbara, Sally Hacker (Ph.D. 1996) Associate Professor, Oregon State University, Michael Baker (M.S. 1996) high school teacher, George Leonard (Ph.D. 1998) Monterey Aquarium, Tatyana Rand (PhD, 2000), Postdoctoral Research Associate, Dresden University, John Bruno, (PhD, 2000), Assistant Professor, University of North Carolina, Pat Ewanchuk (PhD, 2002), Assistant Professor, Providence College, Brian Reed Silliman (Ph.D. 2003) Assistant Professor, University of Florida, Keryn Bromberg, Kristi Croker and Caitlin Mullin (current)

Sponsored Post-Doctoral Associates (10 total): Philip Yund, Director of Research, Southern Maine Marine Center; Richard Wahle, Research Scientist, Bigelow Marine Laboratory; Steven Brewer, Associate Professor, University of Mississippi, Todd Minchinton, Assistant Professor, University of Adelaide, Geoff Trussell, Assistant Professor, Northeastern University, Marine Science Center, Cesar Costa, Professor, University of Rio Grande, Brazil Alejandro Bortolus, Research Scientist, University of Central Patagonia, Johan Van de Kopple, Research Scientist, Netherlands Institute of Marine Biology, Eric Sanford, Assistant Professor, UC Davis and Andrew Irving (current).

Collaborators: Steven Gaines, University of California, Santa Barbara; Mark Hay, Georgia Tech Yellow Jackets; Steve Pennings, University of Houston, Ted Grosholz, UC, Davis; Laura Gough, University of Southwest Texas, Jonathan Levine, UC, Santa Barbara

Graduate Advisor: G. J. Vermeij, University of California, Davis

STEPHEN MORGAN BOLLENS

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Washington State University Vancouver
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[http://www.vancouver.wsu.edu/
programs/sci/default.htm](http://www.vancouver.wsu.edu/programs/sci/default.htm)

EDUCATION

B. A., Biology, Oberlin College	1982
M. Sc., Biological Oceanography, University of Washington	1986
Ph. D., Biological Oceanography, University of Washington	1990

OTHER TRAINING

Harvard University, Graduate School of Education, Institutes of Higher Education, Management Development Program	2001
Council for the Advancement and Support of Education, Summer Institute in Educational Fund Raising, Dartmouth College	2003

PROFESSIONAL EXPERIENCE

Research/Teaching Assistant, School of Oceanography, University of Washington	1984 - 1990
Postdoctoral Scholar - Investigator, Biology Department, Woods Hole Oceanographic Institution	1990 - 1992
Faculty Member (visiting), East/West Marine Biology Program, Northeastern University (Friday Harbor Laboratories)	1991
Faculty Member (temporary), Hatfield Marine Science Center, Oregon State University	1992
Assistant Scientist (tenure-track), Biology Department, Woods Hole Oceanographic Institution	1992 – 1996
(On Leave)	(1996 – 1998)
Faculty Member, Massachusetts Institute of Technology – Woods Hole Oceanographic Institution Joint Ph.D. Program	1993 - 1996
Guest Researcher, Max Planck Institute for Limnology, Ploen, Germany	1993; 1994
Associate Professor, Department of Biology and Romberg Tiburon Center for Environmental Studies, San Francisco State University	1996 - 1999
Assistant Dean, Office of Research and Sponsored Programs, San Francisco State University	1998 - 2003

Professor, Department of Biology and Romberg Tiburon Center for Environmental Studies, San Francisco State University	1999 - present
Visiting Scientist, Moss Landing Marine Laboratories, California State University System	2000 - 2001
Visiting Professor, School of Oceanography, University of Washington	2002 - 2003
Adjunct Professor, Department of Wildlife, Fish and Conservation Biology, University of California, Davis	2003 - present
Associate Dean, Research and Development, College of Science and Engineering, San Francisco State University	2003 - 2004
Professor, School of Biological Sciences, Washington State University	2004 -present
Director, Science Programs, Washington State University Vancouver	2004 -present

HONORS AND AWARDS

Woods Hole Oceanographic Institution Postdoctoral Scholar Award	1990 - 1991
Office of Naval Research Young Investigator Award	1994 -1998
San Francisco State University Presidential Fellowship	1998 - 1999
Elected Fellow, California Academy of Sciences	2000

PROFESSIONAL SERVICE

Executive Committee, Global Ocean Ecosystem Dynamics (GLOBEC) Georges Bank/Northwest Atlantic Program	1993 - 1996
Executive Committee, Bering Sea Fisheries Oceanography Coordinated Investigations (BS FOCI)	1993 - 1997
Panel Member, National Science Foundation, Ocean Sciences	1995; 1996
Panel Member, Science Advisory Panel, Cape Cod Commission	1995 - 2000
Board of Directors, Romberg Tiburon Center for Environmental Studies	1996 - 2004
Board of Governors, Moss Landing Marine Laboratories	1997 - 2004
Graduate Coordinator for Marine Biology Program, Department of Biology, San Francisco State University	1997 - 2002
Panel Member, National Science Foundation, Field Stations and Marine Laboratories Program	1997; 1998
Estuarine Ecology Team, Interagency Ecological Program, San Francisco Bay-Delta Program	1998 - 2004

Panel Member, National Science Foundation / National Oceanic and Atmospheric Administration's Coastal Ocean Program	1999
Scientific Steering Committee, Coastal Ocean Processes (CoOP) Program	2000 - 2004
Bay-Delta Science Consortium Executive committee (San Francisco State University's representative)	2001 - 2004
Co-Chair, Science Program Committee, 2003 Estuarine Research Federation Biennial Conference, Seattle, WA	2001 - 2003

PUBLICATIONS

1. **Bollens**, S. M. 1988. A model of the predatory impact of larval marine fish on the population dynamics of their zooplankton prey. *J. Plankton Res.* 10: 887-906.
2. **Bollens**, S. M. and B. W. Frost. 1989. Zooplanktivorous fish and variable diel vertical migration in the marine planktonic copepod Calanus pacificus. *Limnol. Oceanogr.* 34: 1072-1083.
3. **Bollens**, S. M. and B. W. Frost. 1989. Predator-induced diel vertical migration in a planktonic copepod. *J. Plankton Res.* 11: 1047-1065.
4. **Bollens**, S. M. 1990. Predation and Diel Vertical Migration in Zooplankton. Ph. D. Dissertation, University of Washington.
5. **Bollens**, S. M. and B. W. Frost. 1990. Ultraviolet light and vertical distribution of the marine planktonic copepod Acartia hudsonica Pinhey. *J. Exp. Mar. Biol. Ecol.* 137: 89-93.
6. **Bollens**, S. M. and B. W. Frost. 1991. Oviparity, selective predation, and variable diel vertical migration in Euchaeta elongata (Copepoda: Calanoida). *Oecologia* 87: 155-161.
7. **Bollens**, S. M. and B. W. Frost. 1991. Diel vertical migration in zooplankton: rapid individual response to predators. *J. Plankton Res.* 13: 1359-1365.
8. **Bollens**, S. M. and D. E. Stearns. 1992. Predator-induced changes in the diel feeding cycle of a planktonic copepod. *J. Exp. Mar. Biol. Ecol.* 156: 179-186.
9. **Bollens**, S. M., B. W. Frost, and T. S. Lin*. 1992. Recruitment, growth, and diel vertical migration of Euphausia pacifica in a temperate fjord. *Mar. Biol.* 114: 219-228.
10. **Bollens**, S. M., B. W. Frost, D. T. Thoreson, and S. D. Watts*. 1992. Diel vertical

- migration in zooplankton: field evidence in support of the predator avoidance hypothesis. *Hydrobiologia*. 234: 33-39.
11. **Bollens**, S. M., B. W. Frost, H. R. Schwaninger*, C. S. Davis, K. L. Way*, and M. C. Landsteiner. 1992. Seasonal plankton cycles in a temperate fjord, and comments on the match-mismatch hypothesis. *J. Plankton Res.* 14: 1279-1305.
 12. Frost, B. W. and S. M. **Bollens**. 1992. Variability of diel vertical migration in the marine planktonic copepod *Pseudocalanus newmani* in relation to its predators. *Can. J. Fish. Aquat. Sci.* 49: 1137-1141.
 13. Van Dover, C. L., S. Kaartvedt, S. M. **Bollens**, P. H. Wiebe, J. H. Martin, and S. C. France. 1992. Deep-sea amphipod swarms. *Nature*. 358: 25-26.
 14. **Bollens**, S. M., B. W. Frost, K. Osgood, and S. D. Watts*. 1993. Vertical distributions and susceptibilities to vertebrate predation of the marine copepods *Metridia lucens* and *Calanus pacificus*. *Limnol. Oceanogr.* 38: 1841-1851.
 15. Marquet, P., M.-J. Fortin, J. Pineda, D. Wallin, J. Clark, Y. Wu, S. M. **Bollens**, C. M. Jacobi, and R. D. Holt. 1993. Ecological and evolutionary consequences of patchiness: a terrestrial - marine perspective. *Lecture Notes in Biomathematics*. 96: 277-304.
 16. Kaartvedt, S., C. L. Van Dover, L. S. Mullineaux, P. H. Wiebe, and S. M. **Bollens**. 1994. Amphipods on a deep-sea hydrothermal treadmill. *Deep-Sea Res.* 41: 179-195.
 17. **Bollens**, S. M., B. W. Frost, and J. R. Cordell+. 1994. Chemical, mechanical, and visual cues in the vertical migration behavior of the marine planktonic copepod *Acartia hudsonica*. *J. Plankton Res.* 16: 555-564.
 18. **Bollens**, S. M., B. W. Frost, and J. R. Cordell+. 1995. Diversity of cues in zooplankton vertical migrations. *J. Plankton Res.* 17: 656-657.
 19. Madin, L. P., S. M. **Bollens**, E. Horgan, M. Butler+, J. Runge, B. K. Sullivan, G. Klein-MacPhee, E. Durbin, A. Durbin, D. VanKeuren, S. Plourde, A. Bucklin, and M. E. Clarke. 1996. Voracious planktonic hydroids: Unexpected predatory impact on a coastal marine ecosystem. *Deep-Sea Res.* 43: 1823-1829.
 20. **Bollens**, S. M. 1996. Diel Vertical Migration in Marine Zooplankton. *Oceanus* 39: 19.
 21. Francis, R. C., K. Aydin, R. Merrick, and S. M. **Bollens**. 1999. Modeling and Management of the Bering Sea Ecosystem, pp. 409-433, In: "Dynamics of The Bering Sea" (Eds: Loughlin, T. R. and K. Ohtani). Fairbanks: University of Alaska Sea Grant Press.
 22. Mincks*, S., S. M. **Bollens**, L. P. Madin, E. Horgan, M. Butler+, P. Kremer, and J.

- Craddock. 2000. Distribution, abundance, and feeding ecology of decapods in the Arabian Sea, with implications for vertical flux. *Deep-Sea Research II*, 47: 1475-1516.
23. Solow, A., S. M. **Bollens**, and A. Beet. 2000. Comparing two vertical plankton distributions. *Limnol. Oceanogr.* 45: 506-509.
 24. Speekmann*, C. L., S. M. **Bollens**, and S. R. Avent*+. 2000. The effect of ultraviolet radiation on vertical distribution and mortality of estuarine zooplankton. *J. Plankton Res.* 22: 2325-2350.
 25. Avent*+, S., S. M. **Bollens**, E. Horgan, M. Butler+, and R. Roundtree. 2001. Planktonic hydroids on Georges Bank: Ingestion and selective feeding by predatory fishes. *Deep-Sea Research II*, 48: 673-684.
 26. **Bollens**, S. M., E. Horgan, S. Concelman*, L. P. Madin, and M. Butler+. 2001. Planktonic hydroids on Georges Bank: Effects of mixing and food supply on feeding and growth. *Deep-Sea Research II*, 48: 659-672.
 27. Butler+, M., M., S. M. **Bollens**, B. Burkhalter*, L. P. Madin, and E. Horgan. 2001. Predatory mesopelagic fishes of the Arabian Sea: Distribution, abundance and diet of *Chauliodus pammelas*, *C. sloani*, *Stomias affinis*, and *S. nebulosus*. *Deep-Sea Research II*, 48: 1369-1383.
 28. Concelman*, S., S. M. **Bollens**, B. Sullivan, E. Horgan, L. Madin, and M. Butler+. 2001. Distribution, abundance and benthic-pelagic coupling of planktonic hydroids on Georges Bank. *Deep-Sea Research II*, 48: 645-658.
 29. Lougee*, L., S. M. **Bollens**, and S. R. Avent*+. 2002. The effect of haloclines on vertical distribution and migration of zooplankton. *J. Exp. Mar. Biol. Ecol.* 278: 111-134.
 30. **Bollens**, S.M., J. C. Cordell, S. Avent*+, and R. Hooff*. 2002. Invasive Zooplankton: A Brief Review, Plus Two Case Studies from the Northeast Pacific Ocean. *Hydrobiologia*, 480: 87-110.
 31. Purkerson*, D. G., M. A. Doblin, S. M. **Bollens**, S. N. Luoma, G. A. Cutter. 2003. Selenium in San Francisco Bay Zooplankton: Potential Effects of Hydrodynamics and Food Web Interactions. *Estuaries*. 26: 956-969.
 32. Beet, A., A. R. Solow, and S. M. **Bollens**. 2003. Comparing vertical plankton profiles with replication. *Mar. Ecol. Prog. Ser.*, 262: 285-287.
 33. **Bollens**, S. M., and A. Sanders. 2004. Ecology of larval Pacific herring *Clupea pallasii* in the San Francisco Estuary: Seasonal and interannual abundance, distribution, diet and

- condition. Amer. Fish. Soc. Symp. 36: 15-35.
34. Hooff*, R. C. and S. M. **Bollens**. 2004. Functional response and potential predatory impact of *Tortanus dextrilobatus*, a recently introduced carnivorous copepod in the San Francisco Estuary. Mar. Ecol. Prog. Ser. 277: 167-179.
 35. Clay*, T. W., S. M. **Bollens**, A. B. Bochdansky#, and T. R. Ignoffo*. 2004. The Effects of Thin Layers on the Vertical Distribution of Larval Pacific Herring, *Clupea pallasii*. J. Exp. Mar. Biol. Ecol. 305: 171-189.
 36. **Bochdansky#**, A. B. and S. M. **Bollens**. 2004. **Relevant scales in zooplankton ecology: Distribution, feeding and reproduction of the copepod *Acartia hudsonica* in response to thin-layers of the diatom *Skeletonema costatum*. Limnol. Oceanogr. 49: 625-636.**
 37. Brown*, H., S. M. **Bollens**, L. P. Madin, and E. F. Horgan. 2005. Effects of Warm Water Intrusions on Populations of Macrozooplankton on Georges Bank, Northwest Atlantic. Cont. Shelf Res. 25: 143-156.
 38. Dorman*, J.G., S. M. **Bollens** and A. M. Slaughter+. 2005. Population Biology of Euphausiids off Northern California, and Effects of Short Time-Scale Winds on *Euphausia pacifica*. Mar. Ecol. Prog. Ser. 288: 183-198.
 39. Dean*, A. F., S. M. **Bollens**, C. Simenstad and J. R. Cordell. 2005. Marshes as sources or sinks of an estuarine mysid: demographic patterns and tidal flux of *Neomysis kadiakensis* at China Camp Marsh, San Francisco Estuary. Estuar. Coast. Shelf Sci., 63: 1-11.
 40. **Ignoffo***, T., S. M. **Bollens**, and A. **Bochdansky#**. 2005. **The Effect of Thin Layers on the Vertical Distribution of the Rotifer *Brachionus plicatilis*. J. Exp. Mar. Biol. Ecol. 316: 167-181.**
 41. **Gewant***, D. S. and S. M. **Bollens**. 2005. **Macrozooplankton and Micronekton of the Lower San Francisco Estuary: Seasonal, Interannual and Regional Variation in Relation to Environmental Conditions. Estuaries, In Press.**
 42. **Slaughter+**, A., S. M. **Bollens**, and G. **Rollwagen Bollens**. 2005. **Grazing Impact of Mesozooplankton in an Upwelling Region of Northern California, 2000-2003. Deep-Sea Res. II, In Press.**
 43. **Papstephanou***, K., S. M. **Bollens**, and A. **Slaughter+**. 2005. **Cross-shelf Distribution of Copepods, and the Role of Event-Scale Winds in a Northern California Upwelling Zone. Deep-Sea Res. II, Accepted, Pending Revisions.**

44. **Fulmer***, J. and S. M. Bollens. 2005. Responses of the chaetognath, *Sagitta elegans*, and larval Pacific hake, *Merluccius productus*, to spring diatom and copepod blooms in a temperate fjord (Dabob Bay, Washington, USA). *Prog. Oceanogr.*, Accepted, Pending Revisions.
45. **Kimmerer**, W., S. Avent*+, S. M. Bollens, T. Visintainer*, F. Freyer, M. Nobriga, and P. Moyle. 2005. Variability in length-weight relationships in fishes of the San Francisco Estuary. *Trans. Am. Fish. Soc.*, Accepted, Pending Revisions.
46. **Visintainer***, T. A., S. M. Bollens, and C. Simenstad. 2005. Community Composition and Diet of Fishes as a Function of Tidal Channel Order: A Field Study in China Camp Marsh, San Francisco Estuary. *Mar. Ecol. Prog. Ser.*, Accepted, Pending Revisions.
47. Johnson*, T. M., **Bollens**, S. M., and A. M. Sanders⁺. Submitted. The limited effect of tidal fronts on larval fishes in the San Francisco Estuary. *Estuaries*.
48. Stoltz*, G. S., S. M. **Bollens**, H. Brown*, L. P. Madin, and E. Horgan. Submitted. The distribution and population biology of the ctenophore *Pleurobrachia pileus* of Georges Bank, Northwest Atlantic. *Mar. Biol.*
49. **Rollwagen Bollens G. C.**, S. M. Bollens, and D. L. Penry. Submitted. Vertical distribution of micro- and nanoplankton in the San Francisco Estuary, in relation to hydrography and predators. *Aquatic Microbial Ecology*.

* **Students** under my direct supervision.

+ **Technicians** under my direct supervision.

Postdoctoral Investigators under my direct supervision.

James Howard Cowan, Jr.

PERSONAL INFORMATION

APPOINTMENTS: Professor of Oceanography and Coastal Sciences (tenured) -
School of the Coast and Environment, Louisiana State
University

ADDRESS: Coastal Fisheries Institute
Louisiana State University
Baton Rouge, LA 70803-7503

DEGREE INFORMATION

(1976) B.S., Old Dominion University, Biological Sciences.
(1981) M.S., Old Dominion University, Biological Oceanography, Minor
Ichthyology.
(1985) Ph.D., Louisiana State University, Marine Sciences, Minor Experimental
Statistics. Marine Science Thesis: The distribution, transport and age structure of
drums (family Sciaenidae) spawned in the winter and early spring in the continental
shelf waters off west Louisiana.

SCHOLARLY ACTIVITIES

Teaching

Courses Taught:

Descriptive Physical Oceanography - (Founded Course; Winter Quarter 1992,
Fall 1993, 1994, 1995, Spring 1997, Fall 1998, Fall 1999, Spring 2001).
Marine Vertebrate Zoology - (Summer Quarter, 1992, 1994, 1997, 1998, 2000).
Fisheries Techniques - (Founded Course, Summer Quarter, 1993, Fall 1996,
Spring 1999, Fall Semester 2000).
Fisheries Oceanography - (Founded Course; Spring Quarter 1994, 1995, 1996,
Fall 1997, Spring Semester 2000, 2002).
Graduate Seminar (Spring Quarter 1993, 1994, Winter 1994, 1996).
Fisheries Recruitment Oceanography (Fall 2002, Fall 2003, Spring 2005 at LSU).
Estuarine Ecology (Fall 2004).

Graduate Student Committee Chairs:

Kirsten Simonsen, Ph.D., Louisiana State University, graduation expected 2008.
David Wells, Ph.D., Louisiana State University, graduation expected 2007.
Pamela MacRae, Ph.D., Louisiana State University, graduation expected 2005.
Brooke Shipley, Ph.D., University of South Alabama, graduation expected 2005.
Lauren Mione, M.S., Louisiana State University, graduation expected 2005.
Michael McDonough, M.S., Louisiana State University, graduation expected 2005.

Research Publications

Books and monographs

Stevens, J.S., J.H. Annala, J.H. Cowan, Jr. and 12 others. 1999. Sharing the
Fish: Toward a National Policy on Individual Fishing Quotas. National
Academy Press, Washington, D.C. 422 pp.

Shorter works

Book Chapters:

- Cowan, J.H., Jr. and R.F. Shaw. 2002. Chapter 6. Recruitment. Pp. 88-111 *In*: L.A. Fuiman and R.G. Werner (eds.). *Fishery Science. The Unique Contributions of Early Life Stage*. Blackwell Science, Ltd., Oxford. 326 pp.
- Cowan, J.H., Jr., K.A. Rose and E.D. Houde. 1997. Size-base foraging success and vulnerability to predation: survivorship in individual based models of larval fish populations. Chapter 13, pages 357-386 *In* R.C. Chambers and E.A. Trippel (eds.), *Early Life History and Recruitment in Fish Populations*. Chapman and Hall's Fish and Fisheries Series, New York.

Articles in Refereed Journals or Bulletins (of ~75):

- Strelcheck, A.J., J.B. Jackson, J.H. Cowan, Jr. and R.L. Shipp. 2004. Age, growth, diet and reproductive biology of the tripletail, *Lobotes surinamensis*, from the north-central Gulf of Mexico. *Gulf Mex. Sci.* 22: 45-53.
- Rutherford, E.S., K.A. Rose, and J.H. Cowan, Jr. 2003. Evaluation of the Shepherd and Cushing (1980) model of density-dependent survival: a case study using striped bass, *Morone saxatilis*, larvae in the Potomac River, Maryland, USA. *ICES J. Mar. Sci.* 60: 1275-1284.
- Patterson, W.F., III and J.H. Cowan. 2003. Site fidelity and dispersion of red snapper associated with artificial reefs in the northern Gulf of Mexico. *Am. Fish. Soc. Symp.* 36: 181-194.
- Rose, K.A. and J.H. Cowan, Jr. 2003. Data, Models, and Decisions in US Marine Fisheries Management: Lessons for Ecologists. *Rev. Ecol. Evolu. System.* 34: 127-151.
- Breitburg, D.L., A. Adamack, S.E. Kolesar, M.B., Decker, K.A. Rose, J.A. Purcell, J.E. Keister, and J.H. Cowan, Jr. 2003. The influence of low dissolved oxygen in the Patuxent River, a seasonally hypoxic estuary. *Estuaries* 26 (2A): 280-297.
- Fuiman, L.A. and J.H. Cowan, Jr. 2003. Repeatability and covariation of survival skills in fish larvae. *Ecology* 84: 53-67.
- Bailey, K., J.H. Cowan, Jr. and R. Shipp. 2003. Experimental evaluation of potential effects of habitat complexity and presence of conspecifics on behavior of young-of-the-year red snapper on artificial reefs. *Gulf Mex. Sci.* 19: 119-131.
- Patterson, W.F., G.W. Ingram, R.L. Shipp and J.H. Cowan, Jr. 2002. Indirect estimation of red snapper (*Lutjanus campechanus*) and gray triggerfish (*Balistes capriscus*) release mortality. *Proc. Gulf Caribb. Fish. Res. Inst.* 53: 526-536.

Articles in Press:

- Fuiman, L.A., J.H. Cowan, Jr. and M.E. Smith, and J.P. O'Neal. Behavioral mechanisms underlying recruitment success in marine fish larvae: variation in survival skills among growth rates and cohorts. *Can. J. Fish. Aquat. Sci.* (*In press*).
- Woods, M. and J.H. Cowan, Jr. Diel spawning periodicity of red snapper *Lutjanus campechanus* in the northern Gulf of Mexico. *J. Fish Biol.* (*In press*).

Participation in Other Professional Meetings, Symposia, Workshops and Conferences

Invited and Contributed Seminars and Presentations (Since 2003, Out of More than 100):

Consequences of Prey Consumption by Pinfish in Sub-tropical Seagrass Meadows: a Bioenergetics

Approach. By James H. Cowan, Jr. and Kip R. Thompson, Proc 134th Annual Meeting of the American Fisheries Society. Madison, Wisconsin, August 2004 (Invited).

Towards a process level understanding of estuarine function: current and possible approaches. By James H. Cowan, Jr. and Kenneth A. Rose, Missouri-Ohio-Mississippi River Basins Workshop, LSU, Baton Rouge, March 2004 (Invited).

Attraction vs. Production of Red Snapper *Lutjanus campechanus* on Alabama Artificial Reef: conceptual models and evidence. By James H. Cowan, Jr. and William F. Patterson III, MarCuba 2003, Havana, Cuba, December 2003 (Invited).

Data, Models and Decisions in U.S. Fisheries Management: Effects of the SFA. By J.H. Cowan, Jr. and K.A. Rose. Managing Our Nations Fisheries: Past, Present and Future, Washing, D.C, November, 2003 (Invited).

Mortality rate of larval fishes and its role in population dynamics of fishes in altered estuarine ecosystems. By J.H. Cowan, Jr. Science Symposium on Environmental and Ecological Effects of Proposed Long-term Water Project Operations, Sacramento, CA, June 2003 (Invited).

Artificial reefs in the northern Gulf of Mexico: their role in a dynamic coastal geography. By J.H. Cowan, Jr., A. Strelcheck and A. Shah. Joint Meeting of the American Society of Ichthyologists and Herpetologists, Manaus, Amazonas, Brazil, July 2003.

Do artificial reefs do what we think they do? By J.H. Cowan, Jr. University of New Orleans, Department of Biology, February 2003 (Invited).

Convenor, 26th Annual Larval Fish Conference (Early Life History Section of the American Fisheries Society), November, 2000.

Convenor, 8th International Conference on Artificial Reefs and Related Aquatic Habitats (8th CARAH). Biloxi, MS, April 2005.

Administrative duties/ editorships

Associate Editor, *Estuaries*--The Journal of the Estuarine Research Federation, 1994-1998.

Associate Editor, *Gulf of Mexico Science*, 1995-2002.

Associate Editor, *Transactions of the American Fisheries Society*, 2002-present.

Current Research Support/Grant Activities

Principal Investigator (with W. Patterson). Post-settlement Movement of Gulf of Mexico Red Snapper Inferred from Otolith Chemistry: Implications for Metapopulation Structure. MARFIN, 2005-2008, \$423,638

Principal Investigator. Age-and-Growth and Reproductive Biology Studies of Louisiana Marine Finfishes in Support of Stock Assessment. Wallop-Breaux, 2004-2009, \$1,007,819.

Principal Investigator. Sport fish utilization of artificial oyster reefs vs. open water

habitats. Louisiana Artificial Reef Program, Louisiana Department of Wildlife and Fisheries, 2004-2007, \$104,000.

Principal Investigator (with R. Shaw). Stable isotopes as tracers of patterns in habitat utilization by juvenile red snapper. MARFIN, 2002-2005, \$76,926.

Co-Principal Investigator (with R. Shaw, LSU and R. Gauldie, University of Hawaii). Platform Recruited Reef Fish, Phase I: Do Platforms Provide Habitat That Increases habitat of juvenile red snapper in the northern Gulf of Mexico. National Sea Grant Program, 2002-2005, \$369,097.

Co-Principal Investigator (with R. Shaw, LSU). Short-term movement, home range and behavior of red snapper around petroleum platforms in the northern Gulf of Mexico as determined by high resolution acoustic telemetry. LSU-MMS Coastal Marine Institute, 2003-2005, \$206,748.

Principal Investigator (with C. Wilson and R. Shaw). Study Phase II. Identifying Essential Fish Habitats in Barataria Bay and Quantifying Their Value to Species of Recreational Importance. Wallop-Breaux, 2003-2005, \$776,583.

Principal Investigator. Capture-recapture studies of spotted-seatrout in Barataria Bay, LA: A pilot study. Wallop-Breaux, 2004-2006, \$205,097.

University Service

Member in Full, Graduate Faculty, Louisiana State University (2001-present).

Chair, Curriculum Committee, Department of Oceanography and Coastal Sciences, Louisiana State University (2004-present).

Member, Academic Affairs Committee, Department of Oceanography and Coastal Sciences, Louisiana State University (2003-present).

Member, Shop Oversight Committee, School of the Coast and Environment, Louisiana State University (2002-present).

Member, Faculty Senate representing the School of the Coast and Environment, Louisiana State University (2002-present).

Member, Committee to Examine the Feasibility of a BS Program in Coastal Environmental Sciences, School of the Coast and Environment, Louisiana State University (2005-present).

Member, LSU Athletic Council, (2003-present).

Member, LSU Graduate Council, (2005-present).

Professional Service

Advisory boards, commissions, or agencies

National/International:

National Research Council (Ocean Studies Board), The National Academy of Sciences, 2005-present (Study of Ecosystem Effects of Fishing: Phase II--- Assessment of the Extent of Change and the Implications for Policy).

National Research Council (Ocean Studies Board), The National Academy of Sciences, 1997-1999 (Study of IFQ's as National Management Policy).

National Research Council (Ocean Studies Board), The National Academy of Sciences. 2003, (Alternate Committee Member, Defining Best Available Science for Fisheries Management).

National Research Council (Ocean Studies Board), The National Academy of

Sciences. 2003, (Invited Presentation, Fisheries Management and the Louisiana Coastal Area).

National Research Council (Transportation Studies Board), The National Academy of Sciences, 2001 (Workshop on Environmental Windows for Dredging Impacts).

National Research Council (Ocean Studies Board), The National Academy of Sciences, 2002, Technical Review of "From Science to Management: Improving the National Marine Fisheries Service".

National Research Council (Ocean Studies Board), The National Academy of Sciences, 1998, Technical Review of "Improving Stock Assessments".

National Science Foundation

- a) Ocean Sciences Division, Biological Oceanography Review Panel, 1996, 1999.
- b) Graduate Research Fellowship Review Panel, 1998-present.

National Sea Grant College Program

- a). National Sea Grant Site Visitation Team, Rhode Island Site Visit, Jamestown, RI, March 1991.
- b). Reviewer for Sea Grant Association Student Awards, Best Student Research 1991, Ph.D. and M.S. candidates.
- c). Fisheries Review Panel, 1994. Graduate College of Marine Studies, University of Delaware, Lewes.

NOAA Coastal Oceans Program

- a). Technical Review Panel, Florida Bay Research Program, Key Largo, FL, December, 2001, October 2003.

NOAA Cooperative Research Program

- a). Technical Review Panel, St. Petersburg, FL, November 2003.

National Undersea Research Program

- a). Technical Review Panel, Wilmington, NC, November 2001.

Invited Participant, NOAA Office of Science and Technology, Working Group to Develop Ecosystem-Based Decision Support Tools for Fisheries Management, Key Largo, FL, February, 2005.

United States Delegation, EcoCuba 2001, Havana, Cuba, June 2001.

United States Delegation, North Pacific Marine Science Organization (PICES), Pusan, Republic of Korea, October 1997.

United States Delegation, International Council for the Exploration of the Sea, 79th Statutory Meeting, La Rochelle, France. October 1991.

Invited Panelist and Speaker, Directions in Marine Research, Managing Our Nations Fisheries, Washington, DC, November, 2003.

Regional---Gulf of Mexico:

Gulf of Mexico Fishery Management Council

- a). Standing Scientific and Statistical Committee, 1995-present.
- b). SEDAR Process Stock Assessment Pool, Chairman 2003-2004.
- c). Mackerel Stock Assessment Panel, 1992-1995. Vice-Chairman 1994-

1995.

d). Reef Fish Stock Assessment Panel, 1992-2004; Chairman 1995-1998, 1999-2004.

e). Ad Hoc Finfish Stock Assessment Panel to Define Overfishing, Chairman 1999-present.

f). Ad Hoc Red Snapper Advisory Panel to Develop an IFQ Program for Gulf of Mexico Red Snapper, Vice-Chairman, 2001-present.

Abbreviated CURRICULUM VITAE

KNEIB, Ronald Thomas

University of Georgia Marine Institute, Sapelo Island, GA 31327; Internet homepage:

<http://www.arches.uga.edu/~rtkneib>

Education

PhD in Ecology, University of North Carolina, Chapel Hill, 1980

MA in Ecology, University of North Carolina, Chapel Hill, 1976

BS in Zoology, Pennsylvania State University, 1972

Professional Experience

Current Appointments:

- Senior Research Scientist, University of Georgia Marine Institute, 1994-present.
- Adjunct Associate Professor of Marine Sciences, University of Georgia, 1993-present.
- Graduate Faculty, University of Georgia, 1991-present.
- Honorary Research Fellow, Swire Institute of Marine Science, University of Hong Kong, 2000-.
- Temporary Graduate Faculty, University of South Carolina, Columbia, SC. 2003 - present.

Professional Certifications:

Senior Ecologist, Board of Professional Certification-Ecological Society of America, 2002-2007

Professional Society Memberships:

American Society of Ichthyologists and Herpetologists, American Society of Limnologists and Oceanographers, Association of Southeastern Biologists, American Fisheries Society, Ecological Society of America, Estuarine and Coastal Sciences Assoc. (U.K.), Estuarine Research Federation, Fisheries Society of the British Isles, Society for Ecological Restoration, Society of Wetland Scientists.

Small Business Operations:

Owner-Operator, RTK Consulting Services (<http://www.rtkconsulting.com>), providing professional ecological consulting services specializing in tidal wetland restoration and fisheries production, 1994-present.

Science & Technical Advisory Committees & Boards:

- *Monitoring Advisory Committee* for the Estuary Enhancement Program in Delaware Bay sponsored by Public Service Electric & Gas Company, annual and semi-annual meetings 1994- 2001.
- *Science Advisory Committee*, Florida Keys National Marine Sanctuary Program, Convened December 2000, Marathon, FL.
- *Estuary Enhancement Program Advisory Committee* (EEPAC) for Public Service Enterprise Group in Delaware Bay, 2-3 meetings annually, February 2002- present.
- *Expert Witness*, Cases involving issuance of dock and marina permits to developments adjacent to tidal marshes in coastal Georgia, Southern Environmental Law Center, 2001-present.
- *Science Advisory Board member*, Center for a Sustainable Coast, St. Simons Island, Georgia, 2002-.
- *Science Advisory Board member*, Satilla Riverwatch Alliance, Waynesville, Georgia, 2004-.

Competitive Grants Awarded (past 5 years):

Principal or Co-Principal Investigators on grants totaling \$3,557,478 from the National Science Foundation, Australian Research Council, U.S. Department of Commerce (Estuarine Research Reserve Program), and the U.S. Environmental Protection Agency.

Professional Service Activities:

Ad hoc Reviewer for 37 national and international scientific journals/publications, 14 national and international granting agencies, including service on 6 national proposal review committees.

Editorial Boards:

Marine Ecology Progress Series, **Contributing Editor** 1997-2002, Guest Editor 2003, Senior Editorial Advisor 1996-1997, Editorial Advisor 1993-96, Editorial Reviewer 1992-93.

Endangered Species Research, Review Editor 2004-present

Honors & Other Recognition:

- § Elected to Phi Beta Delta Honor Society for International Scholars, 1997
- § Elected to Phi Kappa Phi Honor Society, 1993
- § Elected Secretary-Treasurer, Southeastern Estuarine Research Society, 1987-89
- § Elected to Sigma Xi, 1976 (Associate), 2001 (Full)
- § Elected to Phi Sigma Society, 1972
- § Certified Senior Ecologist, Ecological Society of America, Jan 2002

- § Invited participant, Charette on South Bay Salt Pond Restoration Project, Coastal Conservancy Association, Marconi Center, February 2005.
- § Invited participant, Workshop for the Development of a Delaware Estuary Fishery Ecosystem Model, Vineland, NJ, October 2004 and Wilmington, DE, August 2005
- § Invited participant, Workshop for the Development of an Estuary Ecosystem Management Program for the New River - Onslow Bight Region of North Carolina, Department of Defense, Strategic Environmental Research and Development Program, Atlantic Beach, NC, February 2004
- § Invited participant, International SCOPE (Scientific Committee on Problems of the Environment) workshop on “Integrating concepts of biodiversity in soils and sediments: a trans-disciplinary assessment of the most critical taxa, functions and habitats for sustainability, their vulnerability and management options”, Estes Park, Colorado, October 20-23, 2002.
- § Invited participant, NSF-sponsored workshop ‘Networking the “Invisible Colleges”’: application of network theory to biocomplexity’, Greenville, NC and Beaufort, NC, 19-24 March 2001
- § Invited participant, International SCOPE (Scientific Committee on Problems of the Environment) workshop on “The role of soil and sediment biodiversity in the functioning of critical transition zones”, Oregon State University, Corvallis, OR, August 28 - September 1, 1999
- § Nominated for Sir Allan Sewell Fellowship at Griffith University, Gold Coast, Queensland, AUSTRALIA in 1998 and 1999
- § Invited participant, Workshop on Fish Production by Tidal Marshes, Public Service Electric & Gas, Newark, NJ, November 25, 1997
- § Invited participant, Symposium on Synthesis, Science, and Ecosystem Management, National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, November 17-20, 1996
- § Invited participant, Workshop on the development of hydrogeomorphic models for coastal fringe wetlands, U.S. Army Corps of Engineers, Charleston, SC, September 1996

Publications (past 5 years):

- Weslawski, J.M., P.V.R. Snelgrove, L.A. Levin, M.C.V. Austen, **R.T. Kneib**, T.M. Iliffe, J.R. Garey, S.J. Hawkins and R.B. Whitlach (2004). Marine sedimentary biota as providers of sustainable ecosystem services. (Chapter 4) pp. 73-98, *In: Wall, D (ed.) Sustaining Biodiversity and Ecosystem Services in Soils and Sediments*, SCOPE Series, Vol. 64. Island Press, Washington, D.C.
- Snelgrove, P.V.R., M.C.V. Austen, S.J. Hawkins, T.M. Iliffe, **R.T. Kneib**, L.A. Levin, J.M. Weslawski, R.B. Whitlach and J.R. Garey. (2004). Vulnerability of marine sedimentary ecosystem services to human activities. (Chapter 7) pp. 161-190, *In: Wall, D (ed.) Sustaining Biodiversity and Ecosystem Services in Soils and Sediments*, SCOPE Series, Vol. 64. Island Press, Washington, D.C.
- Ineson, P., L.A. Levin, **R.T. Kneib**, R.O. Hall, J.M. Weslawski, R.D. Bardgett, D.A. Wardle, D.H. Wall, W.H. Van der Putten & H. Zadeh. (2004). Cascading effects of deforestation on

ecosystem services across soils and freshwater and marine sediments. (Chapter 9) pp. 225-248, *In: Wall, D (ed.) Sustaining Biodiversity and Ecosystem Services in Soils and Sediments*, SCOPE Series, Vol. 64. Island Press, Washington, D.C.

Peterson, C.H. & **R.T. Kneib** (Coordination/Editors) (2003) Restoration scaling in the marine environment. Theme Section, Marine Ecology Progress Series 264:173-307.

Kneib, R.T. (Contributor) in H.U. Riisgård. 2004. Peer-review of journal articles versus research proposals - what is the difference? *Marine Ecology Progress Series* 277:301-309. see also <http://www.int-res.com/journals/meps/themeSections.html>

Webb, S. & **R.T. Kneib** 2004. Individual growth rates and movement of juvenile white shrimp (*Litopenaeus setiferus*) in tidal marsh nursery. *Fishery Bulletin* 102: 376-388.

Kneib, R.T. 2003. Bioenergetic and landscape considerations in scaling estimates of nekton production from natural and restored intertidal marshes. *Marine Ecology Progress Series* 264: 279-296.

Peterson, C.H., **R.T. Kneib** & Manen, C.A. 2003. Scaling restoration actions in the marine environment to meet quantitative targets of enhanced ecosystem services: a theme section. *Marine Ecology Progress Series* 264:173-175.

Kneib, R.T. (Contributor) in H.U. Riisgård. 2003. Misuse of the peer-review system: time for countermeasures? *Marine Ecology Progress Series* 258:297-309. see also <http://www.int-res.com/journals/meps/themeSections.html>

Kneib, R.T. 2002. Book Review of "The Ecology of Seashores", G.A. Knox. *Limnology & Oceanography* 47(4):1268.

Webb, S.R. & **R.T. Kneib**. 2002. Distribution and abundance of juvenile white shrimp *Litopenaeus setiferus* within a tidal marsh landscape. *Marine Ecology Progress Series* 232:213-223.

Kneib, R.T. & A. Craig. 2001. Efficacy of minnow traps for sampling mummichogs in tidal marshes. *Estuaries* 24:884-893.

Kneib, R.T. & M.C. Huggler. 2001. Tag placement, mark retention, survival and growth of juvenile white shrimp (*Litopenaeus setiferus* Perez Farfante, 1969) injected with coded wire tags. *Journal of Experimental Marine Biology and Ecology* 266:109-120.

Levin, L.A., D.F. Boesch, A. Covich, C. Dahm, C. Erséus, K.C. Ewel, **R.T. Kneib**, A. Moldenke, M.A. Palmer, P. Snelgrove, D. Strayer, J.M. Welawski. 2001. The function of marine critical transition zones and the importance of sediment biodiversity. *Ecosystems* 4:430-451.

Ewel, K.C., C. Cressa, **R.T. Kneib**, P.S. Lake, L.A. Levin, M.A. Palmer, P. Snelgrove, D.H.

Wall. 2001. Managing critical transition zones. *Ecosystems* 4:452-460.

Kneib, R.T. & C.E.H. Scheele. 2000. Does tethering of mobile prey measure relative predation potential?: An empirical test using mummichogs and grass shrimp. *Mar. Ecol. Prog. Ser.* 198:181-190.

Graça, M.A.S., S.Y. Newell & **R.T. Kneib**. 2000. Grazing rates of organic matter and living fungal biomass of decaying *Spartina alterniflora* by three species of salt-marsh invertebrates. *Mar. Biol.* 136:281-289.

Kneib, R. T. 2000. Salt marsh ecoscapes and production transfers by estuarine nekton in the southeastern U.S., pp. 267-291, In: M.P. Weinstein & D.A. Kreeger (eds.), *Concepts and controversies in tidal marsh ecology*, Kluwer Academic Publishers, The Netherlands.

Curriculum Vitae 9/29/2005

Name Parker MacCready
URL www.ocean.washington.edu/people/faculty/parker/

Education

1982 B.A., Yale University
1986 M.S., California Institute of Technology (Engineering Science)
Advisor: Dr. T. Y.-T. Wu
1991 Ph.D., University of Washington (Physical Oceanography)
Thesis: Frictional Slowing of Rotating, Stratified Flow along a Sloping Boundary
Advisor: Dr. Peter B. Rhines

Employment

2001-present Associate Professor, University of Washington
1994-2001 Research Assistant Professor, University of Washington
1993-1994 Research Scientist, University of Washington
1991-1993 Postdoctoral Fellow, University of Miami
1987-1991 Research and Teaching Assistant, University of Washington
1986-1987 Research Assistant, California Institute of Technology
1977-1985 Aeronautical Engineering Technician, AeroVironment Inc.

Bibliography

Refereed

MacCready, P., and P. B. Rhines 1991: Buoyant inhibition of Ekman transport on a slope and its effect on stratified spin-up, *J. Fluid Mech.*, **223**, 631-661.

MacCready, P., and P. B. Rhines 1993: Slippery Bottom Boundary Layers on a Slope, *J. Phys. Oceanogr.*, **23**, 5-22.

Garrett, C., P. MacCready, and P. B. Rhines 1993: Boundary Mixing and Arrested Ekman Layers: Rotating, Stratified Flow Near a Sloping Boundary, *Ann. Rev. Fluid Mech.*, **25**, 291-323.

MacCready, P. 1994: Frictional Decay of Abyssal Boundary Currents, *J. Mar. Res.*, **52**, 197-217.

MacCready, P. 1999: Estuarine Adjustment to Changes in River Flow and Tidal Mixing, *J. Phys. Oceanogr.*, **29**, 708-726.

- MacCready, P., W. E. Johns, C. G. Rooth, D. M. Fratantoni, & R. A. Watlington 1999: Overflow into the Deep Caribbean: Effects of Plume Variability. *J. Geophys. Res.*, **104**, 25913-25935.
- Hickey, B. M., P. MacCready, E. Elliott, and N. B. Kachel, 2000: Dense saline plumes in Exuma Sound, Bahamas. *J. Geophys. Res.*, **105**, 11471-11488.
- MacCready, P., and P. B. Rhines (2001) Meridional Transport Across a Zonal Channel: Topographic Localization. *J. Phys. Oceanogr.*, **31**, 1427-1439.
- MacCready, P. and W. R. Geyer (2001) Estuarine Salt Flux Through an Isohaline Surface. *J. Geophys. Res.*, **106**, 11629-11637.
- MacCready, P. and G. Pawlak (2001) Stratified Flow along a Rough Slope: Separation Drag and Wave Drag. *J. Phys. Oceanogr.*, **31**, 2824-2839
- MacCready, P. and P. Quay (2001) Biological Export Flux in the Southern Ocean Estimated from a Climatological Nitrate Budget. *Deep-Sea Res.*, **49**, 4299-4322.
- Pawlak, G. and P. MacCready (2002) Oscillatory flow across an irregular boundary. *J. Geophys. Res.*, **107**, 4-1 to 4-17.
- MacCready, P., R. D. Hetland, and W. R. Geyer (2002) Long-Term Isohaline Salt Balance in an Estuary. *Continental Shelf Res.*, **22**, 1591-1601.
- Pawlak, G., P. MacCready, K. A. Edwards, R. McCabe (2003): Observations on the evolution of tidal vorticity at a stratified deep water headland. *Geophys. Res. Lett.*, **30**(24), 2234, 10.1029/2003GL018092.
- Banas, N.S., B.M. Hickey, P. MacCready, and J. A. Newton (2004) Dynamics of Willapa Bay, Washington, a highly unsteady partially mixed estuary. *J. Phys. Oceanogr.*, **34**, 2413-2427.
- Edwards, K. A., P. MacCready, J. N. Moum, G. Pawlak, J. Klymak, and A. Perlin (2004): Form Drag and Mixing due to Tidal Flow past a Sharp Point. *J. Phys. Oceanogr.*, **34**, 1297-1312.
- MacCready, P. (2004): Toward a Unified Theory of Tidally-Averaged Estuarine Salinity Structure. *Estuaries*, **27**, 561-570.
- Martin, W., P. MacCready, and R. Dewey, Boundary Layer Forcing of a Semi-Diurnal Cross-Channel Seiche. In press *J. Phys. Oceanogr.*
- Babson, A. L., M. Kawase, P. MacCready, Seasonal and interannual variability in the circulation of Puget Sound, Washington: A box model study. In press, *Atmosphere-Oceans*, July 2005.

McCabe, R., P. MacCready, and G. Pawlak, Form Drag due to Flow Separation at a Headland. Submitted to *J. Phys. Oceanogr.*, November 2004.

Conference Proceedings

Rhines, P. B., and P. MacCready 1989: Boundary Control over the Large-Scale Circulation, *Proceedings of the Fifth 'Aha Huliko'a Hawaiian Winter Workshop on Parameterization of Small-Scale Processes*, Hawaii Institute of Geophysics, Honolulu, 75-97.

MacCready, P., and P. B. Rhines 1993: Ocean Circulation: Overturning Modes Driven by Stress and Buoyancy, *Ninth Conference on Atmospheric and Oceanic Waves and Stability, preprints*, 53-55.

MacCready, P., and G. Pawlak 2001: Tidal Eddy Generation at Three Tree Point: Theory and Numerical Modeling. Proceedings of the Puget Sound Research Conference 2001, 6 pp.

G. Pawlak, P. MacCready, K. Edwards, R. McCabe 2002: Evolution of Tidal Vorticity in Stratified Coastal Flow. Proceedings of OMAE'02, Oslo, Norway, 8 pp.

MacCready, P., G. Pawlak, K. A. Edwards, R. McCabe, "Form Drag on Ocean Flows," (18 pp.). In press, Proceeding of the 13th 'Aha Huliko'a Hawaiian Winter Workshop on "Near Boundary Processes and their Parameterization."

G. Pawlak, P. MacCready and R. McCabe, "Evolution of Vortical Flow Structure in an Ocean Boundary Process," (12 pp.). In press, Proceeding of the 13th 'Aha Huliko'a Hawaiian Winter Workshop on "Near Boundary Processes and their Parameterization."

Reimers, C., C. Friedrichs, B. Bebout, P. Howd, M. Huettel, R. Jahnke, P. MacCready, K. Ruttenberg, L. Sanford, and J. Trowbridge (2004): Coastal Benthic Exchange Dynamics. CoOP Report No. 10. Skidaway Institute of Oceanography Technical Report TR-04-01, 92 pp.

Technical Reports

MacCready, P., and R. A. Watlington 1993: Hydrographic Data from R. V. *Columbus Iselin* Cruises 9101 & 9203, RSMAS Technical Report No. 93-003, University of Miami, 191 pages.

Meeting presentations, popular articles, book reviews

MacCready, P. 1986: Features of Flapping-Wing Propulsion. *Third International Human Powered Vehicle Scientific Symposium, Proceedings*, A. Abbott, ed., IHPVA, Seal Beach, CA, USA, 45-52.

MacCready, P. 1990: Hydrofoil Boats with Flapping-Wing Propulsion. *Human Power*, **8**, no. 1, 9-16.

MacCready, P. 1997: In Shallow Water: Basic vs. Applied Science, NSF-sponsored Advances and Primary Research Opportunities in Physical Oceanography Studies (APROPOS) Workshop, Monterey, CA. See: www.joss.ucar.edu/joss_psg/project/oce_workshop/apropos/presentations/maccready.htm

MacCready, P. 1998: Numerical Circulation Modeling as a Tool for Harmful Algae Bloom Research and Prediction, Puget Sound Research '98 Conference, Seattle, WA (see the link from my web page)

MacCready, P. 1998: Book Review: Estuaries: a Physical Introduction, by K. R. Dyer. *Continental Shelf Res.*, **18**, 1667-1668.

MacCready, P. 2004: River Influences on Shelf Ecosystems: RISE News. *Newsletter of Coastal Ocean Processes*, No. **18**, p. 3-.

Honors and Awards

- 2005 Donald R. Pritchard Award for the outstanding Physical Oceanography paper in the journal *Estuaries* during the last 2 years
- 2005 H. Burr Steinbach Visiting Scholar for Physical Oceanography, WHOI, September 2005
- 1997-2002 Office of Naval Research/University of Washington Scholar of Oceanography Award (with Mike Gregg, SECNAV/CNO Chair of Oceanography)
- 1991-1993 Rosenstiel Post-Doctoral Fellowship, University of Miami
- 1989 Outstanding Student Paper Award, American Geophysical Union, Ocean Sciences

University Service

School of Oceanography

- 1995-1996 Member, Faculty Council
- 1996-1999 Member, Academic Affairs Committee
- 2002 Organized Oceanography Seminar Series on Coastal and Estuarine Studies
- 2003 SO Open House Committee member
- 2004-2005 SO Strategic Planning Committee member

University

- 2000 Speaker, Honor Student Invitational (UW Admissions Office)

2004-2007 Member, Program on the Environment Governing Board (Chair 2004-2005)

Professional Offices, Awards, Service

National Committees and Related Activities

1997 Speaker and participant, NSF APROPOS Workshop (Advances and Primary Research Opportunities in Physical Oceanography Studies)
1998 Panelist, NSF Ocean Sciences, Physical Oceanography
2001 Invited Participant, ONR Ocean Acoustic Meeting, Dallas, TX, January
2003- CoOP (Coastal Ocean Processes) Scientific Steering Committee member
2004 CoOP Benthic Exchange Workshop - Organizing Committee member
2003-2006 Associate Editor, *Journal of Physical Oceanography*
2004-2005 Conference Committee Member for Gordon Conference on Coastal Ocean Circulation, June 2005

Washington State Agency

1995-1998 Washington State Dept. of Ecology (reviewing annual data reports)
1997 Invited Panelist, Scientific Review for LOTT (Lacey Olympia Tumwater Thurston) Budd Inlet Sewage study, Washington State Dept. of Ecology
2003 Scientific Review Panel for the new marine sewage outfall north of Seattle (King County DNR, WA Ecology).
2004 Scientific advisory group member, Puget Sound Center for Urban Bay Research, Tacoma WA.

Professional society

2000 Convener, AGU Ocean Sciences Special Session: "Flow over Rough Topography" (Kurt Polzin, co-Convener)
2000 Convener, AGU Fall Meeting Special Session: "Estuarine Circulation, Mixing, and Modeling" (Rocky Geyer, co-convener)
2002-3 Program Committee Member for Estuarine Research Federation 2003 Meeting
2003 Convener, Estuarine Research Federation 2003 Meeting Special Session, "Estuarine Turbulence" (Rocky Geyer and Stephen Monismith, co-convener)
2004 Convener, AGU Fall Meeting Special Session, "Interdisciplinary River Plume Studies," (Bob Chant, co-convener).
2005 Co-convener, Estuarine Research Federation 2003 Meeting Special Session, "Estuarine - coastal ocean exchange of water, energy, and waterborne materials: innovative methods, and /or high resolution observations or modeling" (Chunyan Li, convener, Bob Chant, co-convener).

Reviewer

National Science Foundation (Physical Oceanography, Biological Oceanography, Career, Polar Programs, and Ocean Instrumentation)

CALFED

California Sea Grant

CFCSA (Canadian)

ECOHAB

EPA

AGU Coastal and Estuarine Studies Series

Antarctic Journal

ASCE Journal of Waterway, Port, Coastal and Ocean Engineering

Continental Shelf Research

Deep-Sea Research

Eos, Trans. AGU

Estuaries

Journal of Fluid Mechanics

Journal of Geophysical Research

Journal of Marine Research

Journal of Physical Oceanography

Limnology and Oceanography

Invited Talks

- 1992 Florida State University, Flow into the Deep Caribbean
- 1996 University of Chicago, Meridional Circulation across the ACC
- 1997 NSF APROPOS Conference, In Shallow Water: Basic vs. Applied Science, 'respondant' talk for Coastal session
- 1998 Puget Sound Research '98 Conference, Numerical Circulation Modeling as a Tool for Harmful Algae Bloom Research and Prediction
- 1999 JGOFS Data Workshop #2, A Diagnostic Budget of Heat and Nitrate in the Southern Ocean Mixed Layer: The Canonical View from Climatologies
- 2000 EPOC Meeting, Stratified Flow Along a Rough Slope: Separation Drag and Wave Drag
- 2002 Ocean Sciences AGU Meeting, Estuarine Adjustment and Sensitivity
- 2002 Bergen University, Norway, [1] Boundary Effects on Ocean Circulation, and [2] Flow over rough coastal topography
- 2003 EGS-AGU Joint Meeting, Nice, France, Observations & Modeling of Form Drag on Rough Coastal Topography
- 2003 Texas A&M University, School of Oceanography Departmental Seminar
- 2004 Highline Community College, Three Tree Point
- 2005 WHOI (three talks, September 2005)

Professional society membership

American Geophysical Union
 American Meteorological Society
 Estuarine Research Federation
 Pacific Estuarine Research Society

Field Work

1992 R.V. Columbus Iselin, Caribbean Sea
 1996- Strait of Juan de Fuca, Willapa Bay, Puget Sound
 2001-2002 Three 10-day cruises in Puget Sound (NSF)
 2003 FHL Summer School, experiments around Puget Sound

Instructional Activities

Courses Taught

Undergraduate:

Course #	Title (credits) (co-Instructor)	Date	Enrollment	Rating
GenSt 197h	Tides, Twisters and Gyres (2) (Rhines)	1998(W)	14	3.9
HA&S 222	Sewage, Science, and Society (5)	2001 (Sp)	18	4.9
HA&S 220	Sci. & Politics of Sewage in PS (5)	2002 (F)	19	4.6

Graduate:

Course #	Title (credits) (co-Instructor)	Date	Enrollment	Rating
OCN 548	Dynamics of Estuaries (3) (Gregg)	1994 (F)	7	3.85
OCN 569	Dynamics of Estuaries (3) (Gregg)	1995 (F)	5	4.1
	PO Grad Student Research Seminars, (1)	1996 (Sp)		
	PO Grad Student Research Seminars, (1)	1996 (F)		
OCN 501	Estuarine Circ. & Mixing (3) (Gregg)	1996 (F)	4	4.2
OCN 501	Estuarine Circ. & Mixing (3) (Gregg)	1999 (W)	7	4.23
OCN 578	Estuarine & Coastal Fluid Dyn. (9) (Geyer)	2003 (S)	12	(NR)
OCN 539	Bio-Physical Interactions (1) (Grunbaum)	2004 (W)	9	3.9

Graduate Students Advised Currently

Member, Committees for (in option) *current*

Fritz Stahr	PhD	1994-1998	reading committee
Jody Klymak	PhD	1995-2001	reading committee
Xuemei Zhang		1995-1997	
Jen MacKinnon	PhD	1996-2002	
Gabe Vecchi	MS	1996-1997	

Steve Goodson	MS	1996-1997	
Liz Elliott		1996-1997	
Sim Larkin	PhD	1996-2000	reading committee
Jonathan Lilly	MS	1996-1997	
Leif Thomas	MS	1997-2003	reading committee
Sean Schenk	MS	1997-1999	
Alana Althaus	MS	1998	
Neil Banas	MS	1998-2005	reading committee
Andrew Chiodi	MS	1998-2003	
<u>Amanda Babson</u>	<u>MS</u>	<u>1999-</u>	
<u>Eleanor Williams Frajka</u>		<u>2002-</u>	
<u>John Mickett</u>		<u>2004-</u>	
<u>Jonathan Kellogg</u>		<u>2004-</u>	
<u>Amy MacFadyen</u>		<u>2005-</u>	

Member, Committees for (out of option or School)

Jim Barnard (Mech. Eng.)	PhD	1995-2000	reading committee
Carol Lee (BioO)	PhD	1998	
Micaela Schnitzler (BioO)	MS	1998	
Cynthia Cudaback (Geophys.)	PhD	1998	
Beth Mullenbach (MG&G)	PhD	2000-2002	
Susanne Menden-Deuer (BioO)	PhD	2003-2004	
<u>Nathalie Hamel (AFS) GSR</u>		<u>2003-</u>	
<u>Tansy Clay (BioO)</u>		<u>2003-</u>	
Bob Hawley (ESS) GSR		2004	
<u>D. Preston Martin (MG&G)</u>		<u>2005-</u>	
<u>Eli Gurarie (QERM)</u>		<u>2005-</u>	

Chair, Committees for

<u>Wayne Martin</u>	<u>MS</u>	<u>1999-</u>	
<i>(Supported by ONR grant, and self)</i>			
<u>Ryan McCabe</u>	<u>MS</u>	<u>2000-</u>	
<i>(Supported by ONR, RRF, and NSF grants)</i>			
<i>Co-Advised by Barbara Hickey</i>			

Chair, Committees for Graduate Students Advised in Past

Dawn Ring	1996
Julian Douglass	1996-97
Tiangang Yu	1998-99

Postdoctoral Associates Advised Currently or in the past

Geno Pawlak	1998-2000 (Now on the faculty at Univ. Hawaii)
Kate Edwards	2000-2002 (Now at APL)
Neil Banas	2005-

Funded Research

"Oceanic General Circulation: Combined Forcing by Stress and Buoyancy", with Peter Rhines PI, NSF, \$793,406, 6/15/93-6/14/96 (21 mo).

"Meridional Circulation in the Deep Caribbean Driven by an Overflow Plume", with Peter Rhines PI, NSF, \$106,000, 6/1/94-11/30/96 (12 mo).

"Meridional Transport Across the Antarctic Circumpolar Current", NSF, \$213,500, 7/1/96-6/30/99 (12 mo).

"Physical and Biological Controls of CO₂ Levels in the Southern Ocean: A Multi Tracer Approach", Paul Quay PI, NSF-JGOFS, \$200,000, 8/1/96-7/31/98 (4 mo).

"Boundary Stress Over Rough Topography", ONR, \$95,000, 10/1/97-9/30/99 (10 mo).

"Boundary Stress Over Extreme Topography", Mike Gregg PI, SECNAV/CNO Chair and ONR Scholar Program, \$1,800,000, 6/1/97-3/14/02 (27 mo).

"CISNet In Situ and Remote Monitoring of Productivity and Nutrient Cycles in Puget Sound", with Al Devol, Steve Emerson, and Mary Jane Perry (UW) and Jan Newton (WA Ecology), NASA & EPA/NOAA, \$581,876, 10/1/98-9/30/01 (0 mo.).

"Natural variability of the physical environment and its effect on the marine ecosystem of Willapa Bay", with Barbara Hickey PI (UW Oceanography) and David Armstrong (UW Fisheries), Washington State Sea Grant, \$175,000, 6/1/99-11/30/00, (0.75 mo.).

"Ocean-Estuarine Coupling and Material Processing by Oysters", with David Armstrong and Curtis Roegner (UW Fisheries), Barbara Hickey (UW Oceanography), PM, Jennifer Ruesink (UW Zoology), Brett Dumbauld (WA DFW), and Jan Newton (WA DOE), Washington State Sea Grant, \$478,702, 1/1/01-12/31/03, (2.5 mo.).

"Observations of Tidal Headland Eddies in Deep Water," with Geno Pawlak (UH), NSF, \$310,000, 3/1/01-2/29/04, (8 mo.).

"Estuarine Adjustment and Sensitivity," NSF, \$256,513, 1/16/2002-2/28/2005, (15 mo.).

"Development of a Prototype Robotic Drifter Boat," UW Royalty Research Fund, \$27,264, 3/16/2002-3/14/2003, (0.25 mo.).

"Collaborative Research: Productivity, Biogeochemical Transformations and Cross-Margin Transport in an Eastern Boundary Buoyant Plume Region" NSF CoOP program, my portion is \$1,074,823, ~6/2003-2008, (18 mo.), Hickey PI.

"A Practical Educational Experience in Estuarine and Coastal Fluid Dynamics," (for FHL Summer School) NSF, \$19,791, 5/2003-2004. Funds for this class were also provided by the School of Oceanography, WHOI, and ONR.

“A Pilot Coastal Observatory for the Estuaries and Shores of Oregon and Washington,” NOAA, \$131,998, 7/1/2004-2/28/2006, (6 mo.), Antonio Baptista (OHSU) PI.

“Collaborative Research: Coastal Form Drag and Eddies,” with Geno Pawlak (UH), NSF, my portion is \$396,084, 9/16/2004-9/15/2007, (13 mo.).

“Remote Sensing and Modeling of Coherent Structures in River and Estuarine Flows,” (Andy Jessup, APL, PI), ONR, my portion is \$76,818, 5/1/2005-4/30/2010.

August 2005

CURRICULUM VITAE

NAME: PAUL EDWARD SMITH

POSITION: Adj. Professor of Oceanography
Integrative Oceanography Division
Biological Oceanography Curricular Group
Scripps Institution of Oceanography
University of California, San Diego
9500 Gilman Drive
La Jolla, California 92093-0203

Currently Visiting Scientist Southwest Fisheries Science Center

PREVIOUS POSITION: To 2002 -Supervisory Fishery Biologist (Research)
Leader of Survey Systems

PREVIOUS ORGANIZATION: National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Science Center
8604 La Jolla Shores Drive
La Jolla, California 92038

DISCIPLINE: Pelagic Ecology

EDUCATION: Ph.D., Zoology, University of Iowa, 1962

EXPERIENCE:

1963 - Present Research Fisheries Biologist
National Marine Fisheries Service
La Jolla, CA
1962 - 1963 Sverdrup Post-Doctoral Fellow
Scripps Institution of Oceanography
La Jolla, CA

HONORS AND AWARDS:

Department of Commerce Gold Medal, 1990
Sverdrup Post-Doctoral Fellowship, 1962
National Science Foundation Fellow 1962

PROFESSIONAL AFFILIATIONS:

Ecological Society of America
American Society of Limnology and Oceanography
American Society of Naturalists

SERVICE ON SCIENTIFIC COMMITTEES:

Student

2003 PhD Gerardo Aceves-Medina CICIMAR Committee
2003 PhD K Alexandra Curtis UCSD Scripps Institution of Oceanography Committee
2002 PhD Ruben Rodriguez Sanchez IPN CICIMAR Committee
2002 Megan C. Ferguson UCSD Scripps Institution of Oceanography Committee
2000 PhD Jana L. D. Davis, UCSD Scripps Institution of Oceanography Committee
1999 PhD Yanira Green CICESE, Ensenada Chair
1999 PhD Eva Coterio CICESE, Ensenada Committee
1999 PhD Shannon Cass-Calay UCSD, Scripps Institution of Oceanography Committee
1999 PhD Paul Dixon UCSD Scripps Institution of Oceanography Committee
1999 PhD Scott Rumsey UCSD, Scripps Institution of Oceanography Committee
1997 PhD Elizabeth A. Logerwell UC Irvine Committee
1997 PhD Karin A. Forney UCSD Scripps Institution of Oceanography Committee
1997 PhD Sue E. Moore UCSD Scripps Institution of Oceanography Co-Chair
1996 PhD Michael G. Hinton UCSD Scripps Institution of Oceanography Co-Chair
1996 MSc Michele L. G. Lyons UCSD, Scripps Institution of Oceanography Committee
1995 PhD Miguel A. Cisneros UC Davis Committee
1994 PhD David A. Demer UCSD Scripps Institution of Oceanography Committee
PhD 1994 Denzil G. M. Miller External Committee, University of Cape Town
MSc 1994 Lynne J. Shannon External Committee, University of Cape Town
PhD 1993 Debra L. Palka Committee, UCSD, Scripps Institution of Oceanography
MSc 1990 Carlos A. Villacastin-Herrero External Committee, University of Cape Town
PhD 1986 Peter A. Shelton External Committee, University of Cape Town
MSc 1986 Juan Felix Elorduy Garay Director, CICESE, Ecologia Marina Ensenada
PhD 1985 Ross Shotton External Committee, Dalhousie University, Nova Scotia
PhD 1984 M. Elizabeth Clarke Committee, UCSD, Scripps Institution of Oceanography
PhD 1982 Paul C. Fiedler Committee, UCSD Scripps Institution of Oceanography
MSc 1982 Stanley C Pillar External Committee, University of Cape Town
PhD 1980 J. Anthony Koslow Committee, UCSD, Scripps Institution of Oceanography
PhD 1979 Robert J. M. Crawford External Committee, University of Cape Town

PUBLICATIONS:

94. Diachok, O., S. Wales, P. Smith, A. Turgut, C. Scalabrin, and M. Richardson. (In preparation) Estimation of bio- and geo-acoustic parameters from transmission loss data in a well calibrated environment. *J. Acoust. Soc. Am.*

93. Diachok, O., S. Wales and P. Smith (2004). "Classification of bio-absorption lines at low frequencies: the Van Holliday connection", *J. Acoust. Soc. Am.*, 115.

92. Aceves-Medina, G., S. P. A. Jimenez-Rosenberg, A. Hinojosa-Medina, R. Funes-Rodriguez, R. J. Saldierna-Martinez, and P. E. Smith. 2004. Fish larvae assemblages in the Gulf of California, *Journal of Fish Biology* 65:832-847.

91. Aceves-Medina G, Jimenez-Rosenberg SPA, Hinojosa-Medina A, Funes-Rodriguez R, Saldierna RJ, Lluch-Belda D, Smith PE, Watson W. 2003. Fish Larvae from the Gulf of California. *Scientia Marina* 67 (1): 1-11 March 2003.

90. Smith, P. E. and H. G. Moser. 2003. Long- term trends and variability in the larvae of Pacific sardine and associated fish species of the California Current region. *Deep Sea Research II Deep-Sea Research II* 50:2519– 2536.
89. Moser, H. G., R. L. Charter, P. E. Smith, D. A. Ambrose, W. Watson, S. R. Charter, and E. M. Sandknop. 2002. Distributional atlas of fish larvae and eggs from MANTA surface samples collected on CalCOFI surveys from 1977 to 2000. California Cooperative Oceanic Fisheries Investigations Atlas No. 35 La Jolla, California.
88. Logerwell, E. A. and P. E. Smith. 2001. GIS mapping of survivors' habitat of pelagic fish off California. pp 51-64 in "Proceedings of the first International Symposium on Geographic Information Systems (GIS) in Fishery Science" (ed.) Nishida, T., P. J. Kailola, C. E. Hollingworth Fishery GIS Research Group Saitama, Japan. Abstract
87. McFarlane, G.A., Baumgartner, T.R., Smith, P.E., Hunter, J.R. 2001. Climate Variability and North Pacific Sardine Populations and Fisheries. Abstract
86. Smith PE. 2001. Garth I. Murphy - 1923-2001 - In Memoriam. California Cooperative Oceanic Fisheries Investigations Reports 42: 8-8 October 2001.
85. Moser HG, Charter RL, Watson W, Ambrose DA, Hill KT, Smith PE, Butler JL, Sandknop EM, Charter SR. The CalCOFI Ichthyoplankton Time Series: Potential contributions to the management of rocky-shore fishes. California Cooperative Oceanic Fisheries Investigations Reports 42: 112-128 October 2001.
84. Logerwell, E. A., B. Lavaniegos, and P. E. Smith. 2001. Spatially-explicit bioenergetics of Pacific sardine in the Southern California Bight: are mesoscale eddies areas of exceptional prerecruit production?. pp 391-406 in 'Beyond El Nino' , F. Chavez (ed) Progress in Oceanography 49
83. Logerwell, E. A. and P. E. Smith. 2001. Mesoscale eddies and survival of late stage Pacific sardine (*Sardinops sagax*) larvae. *Fisheries Oceanography* 10:1,13-25.
82. Smith, P. E., Horne, J. K., and Schneider, D. C. 2001. Spatial dynamics of anchovy, sardine, and hake pre-recruit stages in the California Current. *ICES Journal of Marine Science*, 58: 1063-1071. Abstract
81. Smith, Paul E. 2000. Chapter 2. Pelagic fish early life history: CalCOFI Overview. pp 8 to 23 in 'Fisheries Oceanography: An Integrative Approach to Fisheries Ecology and Management', Paul J. Harrison and Timothy R. Parsons Eds., Blackwell Science Ltd., Oxford, UK. Fish and Aquatic Resources Series, No. 4.
80. Hayward TL, Baumgartner TR, Checkley DM, Durazo R, Gaxiola-Castro G, Hyrenbach KD, Mantyla AW, Mullin MM, Murphee T, Schwing FB, Smith PE, Tegner MJ. The state of the California Current in 1998-1999: Transition to cool-water conditions. California Cooperative Oceanic Fisheries Investigations Reports 40: 29-62 October 1999.
79. Horne, J. K., P. E. Smith, D. C. Schneider. 1999. Comparative examination of scale-explicit biological and physical processes: recruitment of Pacific Hake (*Merluccius productus*). *Canadian Journal of Fisheries and Aquatic Sciences* 56(Suppl. 1): 170-179.
78. Gartz, R. G., L. W. Miller, R. W. Fujimura, and P. E. Smith. 1999. Measurement of larval striped bass (*Morone saxatilis*) net avoidance using evasion radius estimation to improve estimates of abundance and mortality. *JOURNAL OF PLANKTON RESEARCH*, MAR, 21:3:561-580.
77. Nonacs, P., P.E. Smith, and M. Mangel. 1998. Modeling foraging in the northern anchovy (*Engraulis mordax*): individual behavior can predict school dynamics and population biology. *Can. J. Fish. Aquat. Sci.* 55:1170-1188. Abstract

76. Moser, H.G., N.C.H. Lo, and P.E. Smith. 1997. Vertical distribution of Pacific hake eggs in relation to stage of development and temperature. Calif. Coop. Oceanic Fish. Invest. Rep. 38:120-126.
75. Horne, J.K. and P.E. Smith. 1997. Space and time scales in Pacific hake recruitment processes: latitudinal variation over annual cycles. Calif. Coop. Oceanic Fish. Invest. Rep. 38:90-102. Manuscript in Adobe
74. Smith, P.E. 1995. Development of the population biology of the Pacific hake, *Merluccius productus*. Calif. Coop. Oceanic Fish. Invest. Rep. 36:144-152.
73. Smith, P.E. 1995. A warm decade in the southern California Bight. Calif. Coop. Oceanic Fish. Invest. Rep. 36:120-126.
72. Ohman, M.D. and P.E. Smith. 1995. A comparison of zooplankton sampling methods in the CalCOFI time series. Calif. Coop. Oceanic Fish. Invest. Rep. 36:153-158.
71. Lo, N.C.H., P.E. Smith, and J.L. Butler. 1995. Population growth of northern anchovy and Pacific sardine using stage-specific matrix models. Mar. Ecol. Progr. Ser. 127:15-26. Abstract
70. Hayward, T.L., D.R. Cayan, P.J.S. Franks, R.J. Lynn, A.W. Mantyla, J.A. McGowan, P.E. Smith, F.B. Schwing, and E.L. Venrick. 1995. The state of the California Current in 1994-1995: a period of transition. Calif. Coop. Oceanic Fish. Invest. Rep. 36:19-39.
69. Lyons, M. L. G., P. E. Smith, and H.G. Moser. 1994. Comparison of cross-shelf trends in Acoustic Doppler Current Profiler Amplitude and Zooplankton Displacement Volume in Southern California. Calif. Coop. Oceanic Fish. Invest. Rep. 35:240-245.
68. Hayward, T.L., A.W. Mantyla, R.J. Lynn, P.E. Smith, and T.K. Chereskin. 1994. The state of the California Current in 1993-1994. Calif. Coop. Oceanic Fish. Invest. Rep. 35:19-35.
67. Nonacs, P., P.E. Smith, A. Bouskila, and B. Luttbeg. 1994. Modeling the behavior of the northern anchovy, *Engraulis mordax*, as a schooling predator exploiting patchy prey. Deep-Sea Research Part II 41(1):147-170. Abstract
66. Butler, J.L, Smith P.E, and N.C.H. Lo. 1993. The Effect of Natural Variability of Life-History Parameters on Anchovy and Sardine Population Growth. Calif. Coop. Oceanic Fish. Invest. Rep. 34:104-111.
65. Moser, H.G. and P. E. Smith. 1993. Larval Fish Assemblages and Oceanic Boundaries. Bull. Mar. Sci. 53:283-289.
64. Moser H.G. and P.E. Smith. 1993. Larval Fish Assemblages of the California Current Region and Their Horizontal and Vertical Distributions Across a Front. Bull. Mar. Sci. 53:645-691. Abstract
63. Lo, N.C.H., J.R. Hunter, H.G. Moser, and P. E. Smith. 1993. A Daily Fecundity Reduction Method of Biomass Estimation with Application To Dover Sole, *Microstomus pacificus*. Bull. Mar. Sci. 53:842-863. Abstract
62. Smith, P.E. 1993. Balancing Sampling Precision and Fisheries Management Objectives - Minimal Methods. Bull. Mar. Sci. 53:930-935. Abstract
61. Smith, P.E., N.C.H. Lo, and J.L. Butler. 1992. Life-Stage Duration and Survival Parameters as Related to Interdecadal Population Variability in Pacific Sardine. Calif. Coop. Oceanic Fish. Invest. Rep. 33:41-49.
60. Lo, N.C.H., J.R. Hunter; H.G. Moser, P.E. Smith; and R.D. Methot. 1992. The Daily Fecundity Reduction Method - a New Procedure for Estimating Adult Fish Biomass. ICES J. Mar. Sci. 49:209-215.
59. Smith, P.E. 1990. Monitoring interannual changes in spawning area of Pacific sardine (*Sardinops sagax*). Calif. Coop. Oceanic Fish. Invest. Rep. 31:145-151.

58. Mangel, M. and P.E. Smith. 1990. Presence-absence sampling for fisheries management. *Can. J. Fish Aquat. Sci.* 47:1875-1887.
57. Lluch-Belda, D., R.J. M. Crawford, T. Kawasaki, A.D. MacCall, R.H. Parrish, R.A. Schwartzlose, and P.E. Smith. 1989. World-wide fluctuations of sardine and anchovy stocks: the regime problem. *S. Afr. J. mar. Sci.* 8:195-205.
56. Paul E. Smith, Haydee Santander, and Juergen Alheit. 1989. Comparison of the mortality rates of sardine (*Sardinops sagax*) and anchovy (*Engraulis ringens*) eggs off Peru. *Fish. Bull., U.S.* 87(3):497-513.
55. Paul E. Smith, Mark D. Ohman, and Laurence E. Eber. 1989. Analysis of the patterns of distribution of zooplankton aggregations from an acoustic doppler current profiler. *Calif. Coop. Oceanic Fish. Invest. Rep.* 30:88-103.
54. Smith, Paul E. and H. Geoffrey Moser. 1988. CalCOFI time series: An overview of fishes. *Calif. Coop. Oceanic Fish. Invest. Rep.* 29:66-77.
53. Jahn, Andrew E. and Paul E. Smith. 1987. Effects of sample size and contagion on estimating fish egg abundance. *Calif. Coop. Oceanic Fish. Invest. Rep.* 28:171-177.
52. Moser, H. Geoffrey, Paul E. Smith, and Lawrence E. Eber. 1987. Larval fish assemblages in the California Current Region, 1954-1960, a period of dynamic environmental change. *Calif. Coop. Oceanic Fish. Invest. Rep.* 28:97-127.
51. Wolf, Patricia, Paul E. Smith, and Cheryl L. Scannell. 1987. The relative magnitude of the 1986 Pacific sardine spawning biomass off California. *Calif. Coop. Oceanic Fish. Invest. Rep.* 28:21-26.
50. Wolf, Patricia and Paul E. Smith. 1986. The relative magnitude of the 1985 Pacific sardine biomass off Southern California. *Calif. Coop. Oceanic Fish. Invest. Rep.* 27:25-31.
49. Smith, Paul E. 1985. A case history of an anti-El Niño to El Niño transition on plankton and nekton distribution and abundances. In: "El Niño North: Niño effects in the eastern subarctic Pacific ocean". ed. Warren S. Wooster and David L. Fluharty. pp 121-142. Washington Sea Grant Program, Univ. of Washington, Seattle, WA 98195 USA.
48. Smith, Paul E. and Roger P. Hewitt. 1985. Sea survey design and analysis for an egg production method of northern anchovy biomass assessment. In: "An egg production method for estimating spawning biomass of pelagic fish: Application to the northern anchovy, *Engraulis mordax*" ed. Reuben Lasker. NOAA Technical Report NMFS 36:17-26.

Andrew R. Solow
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

Professional Experience

- 1994-present Director, Marine Policy Center
Woods Hole Oceanographic Institution
- 1987-present Assistant Scientist, Associate Scientist, Senior Scientist
Woods Hole Oceanographic Institution
- 1985-1987 Post-doctoral Fellow
Woods Hole Oceanographic Institution

Education

- 1986 PhD, Geostatistics
Stanford University
- 1977 BA, Economics
Harvard University

Past and Present Memberships

- Editorial Board, Environmental and Ecological Statistics
- Editorial Board, Ecology
- Editorial Board, American Naturalist
- Chairman, U.S. EPA, MA DEP Outfall Monitoring Science Advisory Panel
- Member, National Academy of Sciences, Commission on Geosciences, Environment, and Resources
- Member, Hypoxia Work Group, White House Committee on Environment and Natural Resources
- Member, US Ocean Commission Science Panel

ROBERT B. SPIES

Applied Marine Sciences (retired from University of California); PO Box 315, Little River, CA 95456
WEB PAGE: www.amarine.com

Education: B.S., St. Mary's College, Moraga, California, 1965; M.S., University of Pacific, Dillon Beach, California, 1969; Ph.D., University of Southern California, Los Angeles, California, 1971

Awards and Fellowships: California State Scholarship, 196; St. Mary's College Scholarship Award, 1965; University of Pacific Research Assistantship, 1965; University of Southern California Assistantship, 1967; National Institute of Health Graduate Research Award, 1968; National Science Foundation, Summer Fellowship, 1969; Arthur Vining Davis Fellowship, 1969

Positions Held: Instructor, University of California, Los Angeles, 1968; Senior Research Officer, Ministry for Conservation, Melbourne, Australia, 1970-1973; Marine Scientist, Lawrence Livermore National Laboratory, Livermore, California, 1973-1991; President, Applied Marine Sciences, 1990-; Chief Scientist, *Exxon Valdez* Oil Spill Trustee Council, 1990-2001; Board of Directors of the Romberg Tiburon Center for Environmental Studies, 1993-2002; Board of Directors, Alaska SeaLife Center, 1994-; President, 2003-

Honors: American Men and Women of Science, 1977; Who's Who in California, 1982; Commendation Letter from US Attorney General, 1992

Major Research Interests: The fate and effects of contaminants (especially petroleum) in the aquatic environment; alteration of hormone production and balance by receptor-mediated contaminant effects; the effects of oil spills on ecosystems; the detection and quantification of polynuclear aromatic hydrocarbons and chlorinated aromatic hydrocarbons in sediments and organisms; the degradation and utilization of petroleum hydrocarbons in sediments; the utilization of petroleum and sewage carbon in nearshore marine food webs; natural isotopes in food webs as tracers; biological processes in natural petroleum seeps; benthic-pelagic coupling; biogeochemistry of oil-contaminated sediments; chemical tracers of street runoff; detecting community change in deep-water, hard-bottom communities; effects of contaminated sediments on marine organisms; design of programs to detect long-term change in benthic communities; applications of accelerator mass spectrometry in marine ecology.

Other Professional Activities (selected): Editorial Board, *Marine Environmental Research*, 1993-; Editor 1987-1993; 2001-; Editorial Board, *Aquatic Toxicology*, 1996-; Member, Consulting Board, Southern California Coastal Water Project, 1986-1989; Member, Environmental Biology Review Panel, US Environmental

Protection Agency, 1982-1984; Member, Regional Effects Technical Advisory Committee, California Regional Water Quality Control Board, 1983-1986; Contributor, National Research Council's Report, *Oil In the Sea*, 1985; Chairman, Technical Advisory Committee, San Francisco Bay-Delta Project, 1987-1989. Member, National Research Council, Panel on Particulate Wastes, Committee on Systems; Assessment of Marine Environmental Monitoring, 1987-1989; Scientific Peer Review Committee, Orange County Sanitation Districts, 1988-. Member, Technical Review Committee, San Francisco Bay-Delta Aquatic Habitat Institute, 1990-; Member, Steering Committee, University of California at Santa Barbara, MMS Educational

Initiative, 1990-; Member, Workshop Panels on Polynuclear Aromatic Hydrocarbons (1988) and Genetic Effects of Sediment Contaminants (1990), Corps of Engineers, Waterways Experiment Station Participant, Workshop to Assess NOAA's National Status and Trends, Program, 1987; Participant, National Research Council, Workshop on Science and Litigation, September, 1991; Participant, National Research Council, Workshop on Coastal Science and Policy; Interactions in the United States, Irvine, CA, 1992; National Research Council, Committee on Exploitation of the Alaskan Outer Continental Shelf, 1992; Invited by the Minister of Transport in Great Britain and Governor of Alaska to visit the site of the *Sea Empress* Oil Spill in Wales, 1996; Member, Scientific Advisory Committee, UC System-wide Lead Campus Program in Exotoxicology, UC Davis. 1998-;

Member, Public Advisory Committee, University of California Toxic Substances Research and Teaching Program, 2000-Member, Interim Science Board, CALFED Restoration Program, Sacramento, CA. 1999-

Member, National Research Council, Committee on Oil in the Sea: Inputs, Fates, and Effects, 2000

Review of proposals, papers and dissertations for: Environmental Protection Agency, National Center for Environmental Research; National Oceanographic and Atmospheric Administration; National Science Foundation; National Research Council; Natural Environment Research Council (United Kingdom); European Congress of Limnology and Oceanography; International Joint Commission (Great Lakes); Massachusetts Sea Grant; Georgia Sea Grant; State of Alaska; Estuarine Research Federation; Department of Energy; National Undersea Research Center; University of California, Davis; University of California, Santa Barbara; University of Maryland; CRC Press; American Chemical Society, Petroleum Research Fund; Southern California Coastal Water Research Project; Hudson River Foundation; John Simon Guggenheim Foundation; *Aquatic Toxicology*; *Canadian Journal of Fisheries and Aquatic Sciences*; *Environmental Toxicology and Chemistry*; *Journal of Experimental Marine Biology and Ecology*; *Marine Biology*; *Marine Ecology Progress Series*; *Marine Pollution Bulletin Science*

SELECTED PUBLICATIONS (peer reviewed: 50+ total)

- 1975 R.B. Spies Uptake of technetium from seawater by red abalone *Haliotis rufescens*, *Health Phys.* 29, 695-699.
- 1979 R.B. Spies and P.H. Davis. The infaunal benthos of a natural oil seep in the Santa Barbara Channel. *Mar. Biol.* 50, 227-237.
- 1981 R. B. Spies, K. Marsh and J. R. Kercher. Dynamics of radionuclide exchange in the calcareous algae *Halimeda* at Enewetak Atoll. *Limnol. Oceanogr.* 26, 74-85.
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