

STEPHEN MORGAN BOLLENS
Professor and Director

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Vancouver, WA 98686-9600	

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
Harvard University, Graduate School of Education, Institutes of Higher Education, Management and Leadership in Education	2007

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 - 2004
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 of Sciences, Vancouver Campus, Washington State University	2004 - present
Director, School of Earth and Environmental Sciences, Washington State University (System-wide)	2006 - 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
Panel Member, National Science Foundation, Coastal Ocean Processes Program	2003
Panel Member, Science Program, California Bay-Delta Authority	2005

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* 28: 473-485.
42. 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.* 134: 481-495.

43. 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.* 67: 442-461.
44. Visintainer*, T. A., S. M. **Bollens**, and C. Simenstad. 2006. Community Composition and Diet of Fishes as a Function of Tidal Channel Geomorphology. *Mar. Ecol. Prog. Ser.*, 321: 227-243.
45. Slaughter+, A., S. M. **Bollens**, and G. Rollwagen Bollens. 2006. Grazing Impact of Mesozooplankton in an Upwelling Region of Northern California, 2000-2003. *Deep-Sea Res. II*, 53: 3099-3115.
46. Papstephanou*, K., S. M. **Bollens**, and A. Slaughter+. 2006. Cross-shelf Distribution of Copepods, and the Role of Event-Scale Winds in a Northern California Upwelling Zone. *Deep-Sea Res. II*, 53: 3078-3098.
47. Johnson*, T. M., S. M. **Bollens**, and A. M. Sanders+. In Revision. 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. In Revision. 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. 2006. Vertical distribution of micro- and nanoplankton in the San Francisco Estuary, in relation to hydrography and predators. *Aquatic Microbial Ecology*, 44: 143-163.
50. Largier, J., M. Roughan, C. Kaplan, E. Dever., K. Lawrence, R. Kudela, S. M. **Bollens**, F. Wilkerson, D. Koracin, L. Botsford, N. Garfield. 2006. WEST: a northern California study of the role of wind-driven transport in the productivity of coastal plankton communities. *Deep-Sea Res. II*, 53: 2833-2849.
51. Cordell, J., M. Rasmussen, and S. M. **Bollens**. 2007. Biology of the introduced copepod *Pseudodiaptomus inopinus* in a northeast Pacific estuary. *Mar. Ecol. Prog. Ser.*, 333: 213-227.
52. Gifford*, S. M., G. Rollwagen-Bollens, and S. M. **Bollens**. 2007. Mesozooplankton omnivory in the upper San Francisco Estuary. *Mar. Ecol. Prog. Ser.* 348: 33-46.
53. Cohen*, S. and S. M. **Bollens**. 2008. Diet and growth of non-native Mississippi silversides and yellowfin gobies in restored and natural wetlands in the San Francisco Estuary. *Mar. Ecol. Prog. Ser.*, 368: 241-254.
54. Cordell, S. M. **Bollens**, R. Draheim, and M. Sytsma. 2008. Asian copepods on the move: recent invasions in the Columbia-Snake river system, USA. *ICES J. Mar. Sci.*, 65: 000-000.
55. Morgan, S. G., J. L. Fisher, A. J. Mace, L. Akins, A. M. Slaughter+ and S. M. **Bollens**. 2008. Does offshore transport of larvae lead to recruitment limitation in regions of strong

- upwelling? Mar. Ecol. Prog. Ser. Submitted.
56. Marko*, L. and S. M. **Bollens**. 2008. Ichthyoplankton of the Lower Columbia River Estuary in Relation to Environmental Variables. Est Coastal Shelf Sci. Submitted
 57. Hoffman*, E. and S. M. **Bollens**. 2008. Macrozooplankton Community Dynamics in Relation to Environmental Variables in Willapa Bay, Washington, USA. Estuaries and Coasts. Submitted.
 58. Cordell, J.R., Tear, L.M., and **Bollens**, S.M. 2008. Modelling physico- chemical factors affecting occurrences of a non-indigenous planktonic copepod in northeast Pacific estuaries. Submitted to Biological Invasions.
 59. Bochdansky, A. and S. M. **Bollens**. 2008. Thin layer formation during runaway stratification in a tidally dynamic estuary. Cont. Shelf Res. Submitted.
 60. Bochdansky A. B., S. M. **Bollens**, G. C. Rollwagen-Bollens, and A. H. Gibson. 2008. The effect of microzooplankton and copepods on vertical carbon fluxes in and around phytoplankton thin layers. Limnol. Oceanogr. Submitted.
 61. Breckenridge*, J. and S. M. **Bollens**. 2008. Biological Thin Layer Formation in Response to Physical Thin Layers: Interactions Between the Larval Decapod, *Neotrypaea californiensis*, Salinity and Light. Cont. Shelf Res. Submitted
 62. Breckenridge*, J. and S. M. **Bollens**. 2008. Vertical Distribution and Migration of Decapod Larvae in relation to Light and Tides in Willapa bay, Washington. Mar Ecol Prog Ser. Submitted.

* **Students** under my direct supervision.

+ **Technicians** under my direct supervision.

Postdoctoral Investigators under my direct supervision.

Non-refereed Publications

63. **Bollens**, S. M., B. W. Frost, and H. R. Schwaninger*. 1989. Seasonal abundance patterns in the ichthyoplankton and zooplankton of a temperate fjord, with comments on the match-mismatch hypothesis. Rapp. P.-v. Reun. Cons. int. Explor. Mer. 191: 456.
64. Madin, L. P., E. F. Horgan, B. K. Sullivan, G. Klein-MacPhee, S. M. **Bollens** and M. Butler⁺. 1997. Estimating the impact of invertebrate predation on target species of copepods on Georges Bank. International Council for Exploration of the Seas 1997 Annual Science Conference, ICES CM 1997/T:16, 14 pp.
65. Solow, A., H. Franklin⁺ and S. M. **Bollens**. 1997. Retrospective analysis of variability in zooplankton community composition of Georges Bank and the Northwest Atlantic. International Council for Exploration of the Seas 1997 Annual Science Conference, ICES CM 1997/T:48, 15 pp.

66. Kimmerer, W., C. Peñalva, S.M. **Bollens**, S. Avent*, and J. Cordell. 1999. Zooplankton in the Lower San Francisco Estuary. Interagency Ecological Program Newsletter. Spring 1999.
67. Avent*, S.R., S.M. **Bollens**, W. Kimmerer, and J. Cordell. 2000. Copepods invade the San Francisco estuary. Ballast Exchange Newsletter, Univ. California Ballast Sea Grant Outreach Project. 2: 4-5.
68. Simenstad, C. and S. M. **Bollens**. 2002. Into the BREACH: Tidal Marsh Restoration in the San Francisco Estuary. Estuarine Research Federation Newsletter. 28(4): 18-21

* **Students** under my direct supervision.

+ **Technicians** under my direct supervision.

GRANTS AWARDED

- Bollens**, S. M., C. S. Davis, and B. W. Frost, Co-Principal Investigators: "Modeling the upper ocean production dynamics of plankton and larval pollock in the Bering Sea." National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Coastal Ocean Program, 1 October 1991 - 30 September 1993, \$122,400, plus three year extension through 30 September 1996, \$141, 616. \$264,000
- Miller, B. S., S. M. **Bollens**, B. W. Frost, and K. Bailey, Co-Principal Investigators: "Recruitment fisheries oceanography of Pacific hake in Dabob Bay, Puget Sound." Sea Grant, National Oceanic and Atmospheric Administration, 1 February 1993 - 31 January 1996. \$89,000
- Bollens**, S. M., Principal Investigator: "Experimental studies of vertical migration in larval reef fishes." National Oceanic and Atmospheric Administration, subcontract from the University of Miami, 1 April 1993 – 31 May 1993, \$18,940; extended from 1 July 1994 - 1 January 1995 \$23,460
- Bollens**, S. M., Principal Investigator: "Towards a comprehensive theory on habitat (depth) selection and foraging behavior in marine zooplankton." Woods Hole Oceanographic Institution, 1 June 1993 - 30 May 1995. \$15,000
- Bollens**, S. M., Principal Investigator: "Field manipulation studies of the growth and behavior of larval reef fishes", National Oceanic and Atmospheric Administration, subcontract from the University of Miami, 1 July 1993 - 31 June 1996 (includes several extensions). \$101,666
- Bollens**, S. M., C. S. Davis, and A. Solow, Co-Principal Investigators: "US GLOBEC: Georges Bank Zooplankton and Storm Effects: Historical Data Analysis and Comparison with Model Results." National Oceanic and

Atmospheric Administration, Climate and Global Change Program, 1 July 1993 - 31 June 1996.	\$126,000
Madin, L. P and S. M. Bollens , Co-Principal Investigators: "US GLOBEC: Effects of predation of fish and invertebrates on target species of fish and copepods on Georges Bank." National Oceanic and Atmospheric Administration, Climate and Global Change Program, 1 July 1993 - 30 June 1998. Funded as a collaborative proposal with B. Sullivan and G. Klein-MacPhee (University of Rhode Island) and M. Grosslein and M. Fogarty (National Marine Fisheries Service).	\$360,000
Bollens , S. M., Principal Investigator: "High-frequency bioacoustic techniques applied to habitat (depth) selection in marine zooplankton: theory and experimental tests", Office of Naval Research (Young Investigator Award), 1 May 1994 - 30 April 1998.	\$299,910
Madin, L. P., S. M. Bollens , and J. E. Craddock, Co-Principal Investigators: "Distribution, biomass and ecological role of macrozooplankton and fishes in the Arabian Sea and equatorial Indian Ocean." National Science Foundation, 1 February 1995 - 31 January 1998. Funded as a collaborative proposal with P. Kremer (University of Southern California).	\$359,219
Madin, L. P. and S. M. Bollens , Co-Principal Investigators: "Assessment of benthic and benthopelagic predator fauna on Georges Bank." National Undersea Research Program, National Oceanic and Atmospheric Administration, 1 March 1995 - 28 February 1996.	\$35,307
Bollens , S. M., and J. H. Steele, Co-Principal Investigators: "Predation closure in modeling the Arabian Sea ecosystem: Model extension and data assimilation." Naval Research Laboratory – Office of Naval Research, 15 April 1995- 14 April 1998.	\$225,000
Bollens , S. M. and B. W. Frost, Co-Principal Investigators: "Modeling the upper ocean production dynamics of plankton and larval pollock in the Bering Sea." National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Coastal Ocean Program, 1 October 1996 - 30 September 1997.	\$65,000
Bollens , S. M., Principal Investigator: "Invasion of San Francisco Bay by Exotic (Non-indigenous) Species of Zooplankton", San Francisco State University, 1 January 1997 - 30 June 1997.	\$5,000
Bollens , S. M., Principal Investigator: "Effects of Massive Flooding in January 1997 on the Zooplankton of San Francisco Bay", United States Geological Survey, 1 April 1997 - 30 September 1997.	\$15,000

- Bollens, S. M.**, Principal Investigator: "Experimental Investigation of Salinity and Nutrient Effects on Florida Bay Plankton and Larval Sea Trout", Sea Grant, National Oceanic and Atmospheric Administration, 1 August 1997 - 31 July 1998. \$31,000
- Bollens, S. M.**, Principal Investigator: "U.S. GLOBEC: Field Studies on Predation Mortality of Copepods and Fish Larvae on Georges Bank." National Science Foundation, 15 November, 1996 - 31 October, 1999. Funded as a collaborative proposal with L. P. Madin (Woods Hole Oceanographic Institution). \$162,819
- Madin, L. P. and S. M. **Bollens**, Co-Principal Investigators: "US GLOBEC: Planktonic hydroids as predators on larval fish and copepods on Georges Bank." National Science Foundation, 1 November 1996 - 31 October 1999. Funded as a subcontract from B. Sullivan's and G. Klein MacPhee's (University of Rhode Island) parent GLOBEC grant from NSF. \$84,000
- Solow, A. and S. M. **Bollens**, Co-Principal Investigators: "US GLOBEC: Retrospective Studies of Variability in Zooplankton Composition on Georges Bank and the Northwest Atlantic." National Science Foundation, 1 November 1996 - 31 October 2000. \$165,000
- Arp, A., S. M. **Bollens**, and J. T. Hollibaugh, Co-Principal Investigators: "Student and Visiting Scientist Housing for The Romberg Tiburon Center", National Science Foundation, 1 May 1997 - 30 April 1999. \$100,000
- Arp, A., S. M. **Bollens**, R. Dugdale, W. Kimmerer, and F. Wilkerson, Co-Principal Investigators: "FSML: Upgrade of the Scientific Capabilities of the Romberg Tiburon Center's Research Vessel." National Science Foundation, 1 September 1997 - 31 August 1998. \$99,000
- Bollens, S. M.**, Principal Investigator: "Studies of Selenium Bioaccumulation in Zooplankton in the San Francisco Bay Delta." United States Geological Survey, 15 August 1998 - 31 August 2000. \$39,888
- Bollens, S. M.**, Principal Investigator: "Georges Bank Zooplankton Data Analysis." Woods Hole Oceanographic Institution, 1 July 1998 - 30 June 1999. \$10,000
- Frost, B. W., J. R. Cordell, and S. M. **Bollens**, Co-Principal Investigators: "Effects of the invasive Asian copepod Pseudodiaptomus on Pacific Northwest estuaries." Sea Grant, National Oceanic and Atmospheric Administration, 1 February 1998 - 31 January 2001. \$182,462
- Bayliss, F T., A. J. Arp, S. M. **Bollens**, I. Erden, N. Gerber, S. Gronert, P.

Palmer, E. Routman, U. Simonis, T. Smith and G. Spicer. "San Francisco State University's Beckman Scholars Program." Beckman Foundation, 1 June 1998 - 30 September 1999.	\$70,400
Bayliss, F. T., S. M. Bollens , and L. Marquez-Magaña,. "SFSU Project for Undergraduate Student Enhancement in Science". Department of Defense, Office of Naval Research, 1 August 1998 - 30 June 2003.	\$2,242,000
Bollens , S. M., Principal Investigator: "U.S. GLOBEC: Predation impacts on target species: Role of frontal processes and small predator species." National Science Foundation, 1 January 1999 - 31 December 2001. Funded as a collaborative proposal with L. Madin (WHOI), B. Sullivan and G. Klein-MacPhee (URI) for a total of \$800,000.	\$269,441
Dugdale, R, S. M. Bollens , F. Wilkerson, W. Kimmerer, J. Thompson, D. Julian and A. Arp, Co-Principal Investigators. "Ecological Indicators Of Ecosystem Condition in the San Francisco Estuary, Environmental Protection Agency, 1 October 1999 – 31 September 2002.	\$891,000
Arp, A., S. M. Bollens , and W. Cochlan, Co-Principal Investigators: "FSML: Upgrade of the Seawater System and Animal Care Facilities at the Romberg Tiburon Center for Environmental Studies", National Science Foundation, 1 November 1999 - 31 September 2000.	\$99,000
Bollens , S. M., Principal Investigator: "CoOP: The Role of Wind-Driven Transport in Shelf Productivity: Zooplankton Population Maintenance, Grazing, and Reproductive Response." National Science Foundation, 1 November 1999 – 31 October 2006.	\$820,182
Bollens , S. M., Principal Investigator: "Zooplankton Behavioral Responses to Thin Layers", Office of Naval Research, 1 January 2000 - 31 December 2001.	\$199,941
Bollens , S. M., Principal Investigator: "Habitat Assessment of Herring and Native Oyster in San Francisco Bay", University of California, Davis/San Francisco Airport Commission, 15 February 2000 - 14 February 2001.	\$58,135
Kimmerer, W., S. M. Bollens , and W. Bennett, Co-Principal Investigators: "Effects of Non-Indigenous Zooplankton and Clams on the San Francisco Estuary Food Web", CALFED Bay/Delta Program, 1 April 2000 - 31 July 2003	\$826,930
Bollens , S. M., Principal Investigator: "Understanding Tidal Marsh Processes and Patterns: Fishes and Invertebrates." CALFED Bay/Delta Program (Sub-contract from UW); 1 April 2000 - 31 July 2004, Funded as a collaborative proposal with S. Simenstad (lead PI, UW), D. Reed (UNO)	

and N. Nur (PRBO) for a total of \$1,042,246.	\$236,744
Bollens, S. M. , Principal Investigator: "Habitat Assessment of Herring and Native Oyster in San Francisco Bay", University of California, Davis/San Francisco Airport Commission, 15 February 2002 - 30 June 2003.	\$120,000
Bollens, S. M. , R. Dugdale, W. Kimmerer, F. Wilkerson, and W. Cochlan, Co-Principal Investigators: "Plankton Communities in South San Francisco Bay: Historical Data Analyses and Pilot Monitoring", City of San Jose, CA, 1 May 2001 - 30 June 2003,	\$506,000
Carpenter, E. J., A. Arp, and S. M. Bollens , Co-Principal Investigators: "FSML: Environmental Monitoring System for the Romberg Tiburon Center for Environmental Studies", National Science Foundation, 1 October 2001 – 30 September 2004.	\$79,927
Bollens, S. M. , Principal Investigator: "Ecology and efficacy of ballast water treatment", California State Water Resources Control Board, 1 May 2001 – 30 June 2002.	\$132,500
Bollens, S. M. , Principal Investigator: "Zooplankton Responses to Thin Layers: Integrating Behavior and Physiology", Office of Naval Research, 1 January 2002 - 30 September 2005.	\$245,000
Bollens, S. M. , Principal Investigator: "U.S. GLOBEC: Integration and Synthesis of the Georges Bank Broad-scale data sets." National Science Foundation, 28 February 2003 - 1 March 2007. (Funded as a collaborative proposal with 12 other PIs for a total of \$1,000,000).	\$86,421
Dugdale, R., S. M. Bollens , A. Arp and E. J. Carpenter, Co-Principal Investigators: "Acquisition of Isotope Tracer Instrumentation for the Romberg Tiburon Center", National Science Foundation, Major Research Instrumentation Program, 1 October 2002 – 30 September 2004	\$245,000
Bollens, S. M. , Principal Investigator: "Building Experimental Capacity to Assess Ballast Treatment Effectiveness and Residual Risk – 2002", United States Geological Survey (as a subcontract from the Northeast Midwest Institute), 1 June 2002 - 31 May 2004. (Funded as a collaborative proposal with 3 other co-PIs for a total of \$ 482,158)	\$91,700
Bollens, S.M. , E. J. Carpenter, R. Dugdale, N. Garfield, A. Arp and F. Wilkerson, Co-Principal Investigators, "CI-CORE: Establishment of a Prototype Monitoring Station at the Romberg Tiburon Center for Environmental Studies", National Oceanic and Atmospheric Administration, 1 September 2002 – 30 August 2003, (Submitted as a collaborative proposal with several other CSU campuses for a total of \$1,750,000)	\$494,223

- Bollens, S.M., E. J. Carpenter, R. Dugdale, N. Garfield, A. Arp and F. Wilkerson, Co-Principal Investigators, “CI-CORE: Further Development of a Prototype Monitoring Station at the Romberg Tiburon Center for Environmental Studies”, National Oceanic and Atmospheric Administration, 1 September 2003 – 30 August 2004, (Submitted as a collaborative proposal with several other CSU campuses for a total of \$950,000) \$125,000**
- Bollens, S. M., Principal Investigator: "Ecology and efficacy of ballast water Treatment: II", California State Lands Commission, 1 January 2003 – 31 December 2003. \$66,250**
- Bollens, S.M., S. W. Siegel, N. M. Kelly, V. T. Parker, M. Vasey, J. Callaway, J. N. Collins, and N. Nur, Co-Principal Investigators: "Integrated Regional Wetlands Monitoring: Component I: Physical Processes, Plants, Birds and Landscape Ecology", CALFED Bay Delta Program, 1 January 2003 - 31 December 2006. \$2,449,847**
- Bollens, S.M., C. Simenstad, E. J. Carpenter, R. Dugdale and F. Wilkerson, Co-Principal Investigators: "Integrated Regional Wetlands Monitoring: Component II: Fishes, Invertebrates, Primary Production and Nutrients", CALFED Bay Delta Program, 1 January 2003 - 31 December 2006. \$1,309,318**
- Frost, B. W. and S. M. Bollens, Co-Principal Investigators: "Larval Pacific hake, *Merluccius productus*, and plankton dynamics in Dabob Bay, Washington", Washington State Sea Grant, National Oceanic and Atmospheric Administration, 1 July 2003 – 30 June 2004. \$10,000**
- Bollens, S. M. and G. C. Rollwagen Bollens, Co-Principal Investigators: "Protistan Microzooplankton in the Suisun Bay Food Web: Source or Sink?", CALFED Bay Delta Program, 1 August 2003 - 31 July 2006 \$229,340**
- Bollens, S.M., E. J. Carpenter, R. Dugdale, N. Garfield, A. Arp and F. Wilkerson, Co-Principal Investigators, “CI-CORE: Continued Development of a Prototype Monitoring Station at the Romberg Tiburon Center for Environmental Studies”, National Oceanic and Atmospheric Administration, 1 September 2004 – 30 August 2005, (Submitted as a collaborative proposal with several other CSU campuses for a total of \$1,750,000) \$375,000**
- Rau, G., S. M. Bollens, and N. Welschmeyer, Co-Principal Investigators: “Carbon Dioxide as a Biocide for Ship Ballast Water: A Laboratory-Scale Study.” Sea Grant, National Oceanic and Atmospheric Administration/ U.S. Fish and Wildlife Service, 16 September 2004 – 31 December 2006. (\$20,000 to WSU via sub-contract from UCSC) \$145,000**

Manning, B., S. M. Bollens , A. Ishimura and B. Laforce, Co-Principal Investigators: "Acquisition of an X-ray Diffractometer for Environmental and Materials Chemistry Research", National Science Foundation, Major Research Instrumentation Program, 1 October 2004 – 30 September 2006	\$190,000
Ristow, S., S. M. Bollens , S.M., and K. Patten, Co-PI's. "Research into alternative controls of ghost and mud shrimp in Willapa Bay"; Washington State University Agricultural Research Station; 1 July 2005 – 30 June 2009	\$800,000
Bollens , S.M., G. Rollwagen Bollens, and A. Bochdansky, Co-PI's. "Grazing impacts of diverse zooplankton taxa on thin layers"; Office of Naval Research; 1 January 2006 – 31 December 2008	\$279,247
Bollens , S.M., and G. Rollwagen Bollens, Co-PI's. "Biotic Assessment of Vancouver Lake;" Clark County/Vancouver Lake Watershed Partnership; 1 April 2007 – 31 March 2008	\$100,247
Rollwagen-Bollens, G., S. M. Bollens , T. Nelson, A. Kennedy, and B. Tissot, Co-PIs. "GK12: Partners in Discovery on the Columbia River," National Science Foundation; 1 February 2008 – 31 January 2013	\$2,711,198
Bollens , S.M., Principal Investigator. "Understanding the Dynamics of Nuisance Algae Blooms in Vancouver Lake," Murdock Charitable Trust, Partners in Science Program; 1 April 2008 – 31 March 2009	\$15,000
Bollens , S.M., and G. Rollwagen Bollens, Co-PI's. "Grazing Impacts and the Biotic Assessment of Vancouver Lake;" Clark County/Vancouver Lake Watershed Partnership; 1 April 2008 – 31 March 2009	\$85,000
Bollens , S.M., Principal Investigator. "Expanding teaching laboratory capabilities in Science and mathematics at WSU Vancouver," Murdock Charitable Trust; 1 January 2009 – 31 December 2010	\$292,228
Bollens , S. M., Principal Investigator: "Understanding Tidal Marsh Processes and Patterns: BREACH III." CALFED Bay-Delta Authority/US Fish and Wildlife Service (CESU); 1 June 2007 - 31 May 2010, submitted as a collaborative proposal with S. Simenstad (lead PI, UW), D. Reed (UNO) and N. Nur (PRBO) for a total of \$2,342,246; WSU total = \$246,744. Verbally approved in December 2006; official notification pending.	\$246,744

COURSES TAUGHT

<u>Course Title</u>	<u>Institution</u>	<u>Dates</u>
Ocean and Coastal Processes (team taught)	East/West Marine Biology Program Friday Harbor Laboratories/ Northeastern University	Autumn 1991
Biological Oceanography	Hatfield Marine Science Center Oregon State University	Summer 1992
Biological Oceanography (team taught)	Woods Hole Oceanographic Institution/ Massachusetts Institute of Technology Joint PhD Program	1993 - 1995

At San Francisco State University

<u>Course Title</u>	<u>Course No.</u>	<u>Date</u>	<u>Student Evaluation Score (1 - 5)*</u>
Biological Oceanography	BIOL 582	Spring 1997	2.07
Plankton Ecology	BIOL 863	Spring 1997	1.17
Principles of Ecology	BIOL 313	Autumn 1997	1.14
Biological Oceanography	BIOL 582	Spring 1998	1.09
Plankton Ecology	BIOL 863	Spring 1999	1.27
Principles of Ecology	BIOL 313	Spring 1999	1.30
Biological Oceanography	BIOL 582	Autumn 1999	2.15
Fisheries Oceanography	MSCI 885	Spring 2001	1.33
Biological Oceanography	BIOL 582	Autumn 2001	1.63
Plankton Ecology	BIOL 863	Spring 2002	1.56
Biological Oceanography	BIOL 582	Autumn 2003	1.40

* Mean score (1=highest; 5=lowest) of responses to "Rank overall performance of instructor."

At Washington State University

<u>Course Title</u>	<u>Course No.</u>	<u>Date</u>	<u>Student Evaluation Score (1 - 5)*</u>
Columbia River Ecology	BIOL 565	Spring 2005	4.13
Biological Oceanography	BIOL 565	Autumn 2005	4.11

* Mean score (1=lowest; 5=highest) of responses to "Rank overall performance of instructor."

SUPERVISION AND MENTORING OF STUDENT RESEARCH

Graduate Students

Dewayne Fox§	MS Student (Committee-member) UW	1993 - 1996
Gorka Sancho	PhD Student (Committee-member) WHOI-MIT	1994 - 1996
Sarah Mincks*§	MA Student (Committee Chair), SFSU	1996 - 1998
(Currently in Ph.D. Program at University of Hawaii)		
Ladd Lougee*§	MA Student (Committee Chair), SFSU	1997 - 2000
Christa Speekmann*§	MA Student (Committee Chair), SFSU	1997 - 2000
(Currently in Ph.D. Program at University of Texas)		
Dave Purkerson*§	MA Student (Committee Chair), SFSU	1998 - 2000
Ulises Ricoy	MA Student (Committee Chair), SFSU	1998 - 2000
Gretchen Stoltz*§	MA Student (Committee Chair), SFSU	1998 - 2001
(Currently in Ph.D. Program at Louisiana State University)		
Harmon Brown*§	MA Student (Committee Chair), SFSU	1999 - 2001
(Currently in Ph.D. Program at Louisiana State University)		
Tessa Johnson*§	MA Student (Committee Chair), SFSU	1999 - 2002
Sean Avent*§	MA Student (Committee Chair), SFSU	1999 - present
Darren Gewant*§	MA Student (Committee Chair), SFSU	1999 - 2003
Jeff Dorman*§	MA Student (Committee Chair), SFSU	2000 - 2002
Rian Hooff*§	MA Student (Committee Chair), SFSU	2000 - 2002
Tansy Clay*§	MA Student (Committee Chair), SFSU	2000 - 2002
(Currently in Ph.D. Program at University of Washington)		
Tammie Visintainer*§	MA Student (Committee Chair), SFSU	2000 - 2003
Kathy Papstephanou*§	MA Student (Committee Chair), SFSU	2001 - 2004
Amy Federline Dean*§	MA Student (Committee Chair), SFSU	2001 - 2004
Toni Ignoffo*§	MA Student (Committee Chair), SFSU	2001 - 2004
Julia Fulmer*§	MA Student (Committee Chair), SFSU	2002 - 2004
Scott Gifford*§	MA Student (Committee Co-Chair), SFSU	2003 - 2006
Sahrye Cohen*§	MA Student (Committee Chair), SFSU	2003 - 2006
Ian McComas§	MS Student (Committee Chair), WSU	2005 - present
Lisa Marko	MS Student (Committee Chair), WSU	2005 - present
Joanne Breckenridge§	MS Student (Committee Chair), WSU	2006 - present
Kate Olsen	MS Student (Committee Chair), WSU	2006 - present
Laura Friedenber	MS Student (Committee Chair), WSU	2006 - present

Eileen Graham§	MS Student (Committee Chair), WSU	2006 – present
Joel Quenette§	MS Student (Committee Chair), WSU	2007 – present
Jennifer Duerr	MS Student (Committee Co-Chair), WSU	2007 – present

Undergraduate Students

Heidi Schwaninger*§	Undergraduate (REU) Student	U. Washington, 1987 - 1989
Tom Lin*§	Undergraduate (REU) Student	U. Washington, 1987 - 1989
Sidney J. Watts*	Undergraduate (REU) Student	U. Washington, 1988 - 1989
Kenneth J. Way*	Undergraduate (REU) Student	U. Washington, 1989 - 1990
Gregg E. Savage	Undergraduate (REU) Student	Woods Hole Ocean. Inst., 1994
Stephanie Concelman*§	Undergraduate (REU) Student	Woods Hole Ocean. Inst., 1995
Brenda Burkhalter*	Post-baccalaureate Guest Student	Woods Hole Ocean. Inst., 1995
Sean Avent*§	Post-baccalaureate Guest Student	Woods Hole Ocean. Inst., 1996
Kristie McCauley	Post-baccalaureate Guest Student	Woods Hole Ocean. Inst., 1996
Sarah Mincks*§	Post-baccalaureate Guest Student	Woods Hole Ocean. Inst., 1996
Paul Gundelfinger	Independent Research (BIO 699)	SFSU, 1997
Steve Lowe	Independent Research (BIO 699)	SFSU, 1997
Harmon Brown§	Independent Research (BIO 699)	SFSU, 1997 - 1998
Darren Gewant§	Independent Research (BIO 699)	SFSU, 1997 - 1998
Devlin Dubriwny	Independent Research (BIO 699)	SFSU, 1998
Patty Fata§	Independent Research (BIO 699)	SFSU, 1998
Toni Ignoffo	Independent Research (BIO 699)	SFSU, 2000

* **Students** under my direct supervision with whom I've co-authored publications in scientific journals (see above).

§ **Students** under my direct supervision with whom I've co-authored presentations at scientific conferences (see below).