

Brad A. Seibel, Ph.D.
Comparative Environmental Physiology (CEPh)
College of Marine Science
University of South Florida
830 1st St SE, St. Petersburg, FL 33701
(cell) 401-744-4927, (email) seibel@usf.edu



APPOINTMENTS

2016-present Full Professor, College of Marine Science, University of South Florida
2015 Full Professor, Biological Sciences Department, University of Rhode Island
2009-2014 Associate Professor, Biological Sciences Department, University of Rhode Island,
2003-2009 Assistant Professor, Biological Sciences Department, University of Rhode Island,

EDUCATION

2001-2003 Postdoctoral Research Fellow.
Monterey Bay Aquarium Research Institute, Moss Landing, CA.
Metabolism of marine animals: implications for a high-CO₂ world.
Advised by Drs. B. Robison and J. Barry.

1999-2001 Postdoctoral Research Fellow.
Rosenstiel School of Marine and Atmospheric Science, University of Miami, FL.
Acid-base balance in marine animals in relation to oceanic carbon dioxide.
Advised by Dr. P. Walsh.

1998 Doctor of Philosophy.
Ecology, Evolution and Marine Biology, University of California, Santa Barbara, CA.
Metabolism and locomotion of cephalopods in relation to habitat depth.
Advised by Dr. James J. Childress.

1992 Bachelor of Arts in Biological Sciences.
University of California, Santa Barbara, CA.

ADDITIONAL TRAINING

2008 Marine Biological Laboratory course in *Optical Microscopy*, Woods Hole, MA.
1999 Student, *Antarctic Biology Training Course*. National Science Foundation, United States Antarctic Program.

RESEARCH INTERESTS

- Biological oceanography, contribution of marine organisms to biogeochemical cycles
- Organismal response to climate change, ocean deoxygenation and ocean acidification
- Pelagic and polar ecology and evolution
- Environmental physiology of marine animals

FIELD EXPERIENCE

- Principal Investigator, McMurdo Station, Antarctica, 5 seasons (2001-2008)
- Principal Investigator, Palmer Station, Antarctica, 2 seasons (2014-2015)
- Chief Scientist, R/V *New Horizon*, Gulf of California, Mexico, June 2006
- Chief Scientist, R/V *New Horizon*, Gulf of California, Mexico, June 2007
- Chief Scientist, R/V *Knorr*, Eastern Tropical North Pacific, October 2007
- Chief Scientist, R/V *Seward Johnson*, Eastern Tropical North Pacific, January 2008
- Chief Scientist, R/V *New Horizon*, Gulf of California, Mexico, June 2010
- Chief Scientist, R/V *New Horizon*, San Clemente Basin, CA, October 2010

- Chief Scientist, R/V *Endeavor*, Oceanographers Canyon, May 2011
- Chief Scientist, R/V *New Horizon*, Gulf of California, Mexico, June 2011
- Chief Scientist, R/V *Endeavor*, Oceanographers Canyon, August 2014
- Chief Scientist, R/V *Oceanus*, Gulf of California, Mexico, May 2015
- Field team member on ~40 research cruises including ~3 years at sea (1992-2014)
- ~100 dives with manned and remotely operated submersibles
- Research certified SCUBA diver (130 ft) with more than 400 dives
- Research Assistant, United States Antarctic Program, *Long-term Ecological Research Project*, 1993.
- Research Assistant, *Kelp forest fish ecology*, Catalina Island Marine Science Center, 1992.

MAJOR GRANT SUPPORT

- 2015-2018 NOAA-OAR-CPO-2014-2004106 – Option 1. *Indicators of habitat change affecting three key commercial species of the U.S. Northeast Shelf: A design to facilitate proactive management in the face of climate change.* \$402,000 (Seibel budget). PI: Vincent Saba (NEFSC). Co-PIs: Brad Seibel (University of Rhode Island), Josh Kohut (Rutgers), Grace Saba (Rutgers), Enrique Curchitser (Rutgers), John Manderson (NEFSC), Jon Hare (NEFSC), David Richardson (NEFSC), Greg DiDomenico (Garden State Seafood Association), Peter Moore (MARACOOS).
- 2015-2018 National Science Foundation, Biological Oceanography. *A metabolic index to predict the consequences of expanding oxygen minimum zones for midwater ecosystems.* \$450,000, Seibel budget.
Lead PI, B. Seibel, with co-PIs C. Deutsch, C. Roman and K. Wishner
- 2014 Rhode Island Endeavor Program 2013-14. *A ship-based course benefiting the Marine Biology program at the University of Rhode Island.* 6 days at sea aboard the R/V *Endeavor*.
Lead PI, B. Seibel.
- 2013-2016 National Science Foundation, Ocean Acidification. *Ocean Acidification: Oxygen-limited CO₂ tolerance in Squids (Ommastrephidae and Loliginidae).* \$393,279.
Lead PI, B. Seibel.
- 2013-2016 National Science Foundation, Office of Polar Programs. *Synergistic effects of elevated carbon dioxide (CO₂) and temperature on the metabolism, growth, and reproduction of Antarctic krill (Euphausia superba).* \$250,861.
Lead PI, G. Saba (Rutgers Univ.), with Co-PI, B. Seibel.
- 2009-2014 Office of Naval Research. *Multidisciplinary University Research Initiative: Biological Response to the Polarized Underwater Light Field.* \$700,000 (URI budget).
Lead PI, M. Cummings (U. T. Austin), with Co-PI, B. Seibel and 10 others.
- 2011-2012 Champlin Foundation: *Scientific Diving as a Tool for Education, Research, and Outreach.* \$128,500.
Lead PI, A. Watson (URI), with Co-PI, B. Seibel and 4 others.
- 2009-2012 National Science Foundation, Biological Oceanography. *Midwater animal models: optical measurement of metabolic transitions in transparent biota.* \$210,000
Lead PI, B. Seibel, with Co-PI, S. Johnsen (Duke University).
- 2009-2012 National Science Foundation, Biological Oceanography. *Collaborative Research: Hypoxia and the ecology, behavior and physiology of jumbo squid.* \$330,944.
Lead PI, B. Seibel, with Co-PI, W. Gilly (Hopkins Marine Station).

- 2006-2009 National Science Foundation, Polar Programs. *Collaborative Research: RUI – Impacts of elevated PCO₂ on pteropod molluscs in the Ross Sea*. \$189,897.
Lead PI, V. Fabry (California State University), with Co-PI, B. Seibel.
- 2006-2009 National Science Foundation, Biological Oceanography. *Zooplankton in the Redoxcline of the Cariaco Basin: Impact on biogeochemical cycling*. \$218,561.
Lead PI, K. Daly (U. South Florida), with Co-PIs, B. Seibel and K. Wishner (URI).
- 2005-2008 National Science Foundation, Biological Oceanography. *Physiological basis of vertical migration in the jumbo squid, *Dosidicus gigas**. \$303,957.
Lead PI, B. Seibel, with Co-PI W. Gilly (Stanford University, Hopkins Marine Station).
- 2005 State of Rhode Island, Endeavor Program. *Blue water optical studies in support of Rhode Island private industry, URI academics, RI*. \$70,000.
Lead PI, J. Sullivan (URI), with Co-PIs, B. Seibel and H. Dierssen (U. Connecticut).
- 2005-2007 NOAA-NERRS. *Effects of winter temperature on population dynamics of *Mnemiopsis leidyi* in Narragansett*. \$40,000.
Lead PI, B. Sullivan (URI), with Co-PIs, B. Seibel and J. Costello (Providence College).
- 2001-2003 National Science Foundation/Polar Programs. *Temperature Compensation in Antarctic Pteropods*. \$164,180.
Lead PI, R. Dudley (UC Berkeley) with Co-PIs, B. Seibel and J. Rosenthal.

MINOR GRANT SUPPORT

- 2013 Company of Biologists Small Meetings Grant - World Congress of Malacology, Azores. Symposium on *Climate Change and Molluscan Ecophysiology*, \$4000.
- 2008 University of Rhode Island Council for Research, Proposal Development Program. *Optical physiology of transparent animals*, \$3,935.
- 2004 University of Rhode Island Council for Research, Proposal Development Program. *Temperature acclimation of locomotory system in pteropod mollusks*, \$8,890.
- 2003 Curriculum Improvement Grant, University of Rhode Island, \$2000.
- 1999 Journal of Experimental Biology Travelling Fellowship, \$1500.
- 1998 Graduate Dissertation Fellowship, Graduate Division, University of California, Santa Barbara, \$4000.
- 1998 Nejat B. Ezal Memorial Fellowship, \$4000.
- 1997 Instructional Improvement, Academic Senate Committee on Effective Teaching, University of California, Santa Barbara, \$1200.

CITATIONS (GOOGLE SCHOLAR)

Full list of publications may be found at: <http://goo.gl/RdqIA>

Total Citations: 3755

h-index: 29 (largest number “h”, such that h publications have at least h citations)

i10-index: 46 (number of publications with at least 10 citations)

BOOKS OR CHAPTERS

- Pörtner, H. O., Seibel, B. A., Melzner, F., Gutowska, M. 2011. Ch. 9. Nekton. In *Ocean Acidification*. J. P. Gattuso, ed. Oxford University Press.
- Drake, B. G., E. A. Johnson, L. Hughes, B. A. Seibel, M. A. Cochrane, V. J. Fabry, L. Hannah, and D. Rasse. 2005. Ch. 18: Synergistic Effects. In: *Climate Change and Biodiversity*. T. E. Lovejoy and L. Hannah, eds. Yale University Press. 424 pp.

Seibel, B. A. and V. J. Fabry. 2003. Marine Biotic Response to Elevated Carbon Dioxide. In: *Climate Change and Biodiversity: Synergistic Impacts. Advances in Applied Biodiversity Science* 4. 59-67.

Ellis, R. and **B. A. Seibel**. *Cephalopods: The Natural & Unnatural History of Squid, Octopuses, Cuttlefish and Other Implausible Creatures*. In revision for University of Chicago Press.

PEER-REVIEWED PUBLICATIONS

Seibel, B. A. Cephalopod susceptibility to asphyxiation via ocean incalcescence, deoxygenation and acidification. *Physiology*. In press.

Deck, C. A., Bockus, A. B., **Seibel, B. A.**, and P. J. Walsh. 2016. Effects of short-term hyper- and hypo-osmotic exposure on the osmoregulatory strategy of unfed North Pacific spiny dogfish (*Squalus suckleyi*). *Comparative Biochemistry and Physiology A*. 193: 29-35.

Trueblood, L. A., S. Zylinski, B. H. Robison, **B. A. Seibel**. 2015. An Ethogram of the Humboldt squid *Dosidicus gigas* (Orbigny, 1835) as Observed from Remotely Operated Vehicles. *Behaviour*.

Deutsch, C., Ferrel, A., **Seibel, B. A.**, H. O. Pörtner, R. B. Huey. 2015. Climate change tightens a metabolic constraint on marine habitats. *Science* 348: 6239 pp. 1132-1135. DOI: 10.1126/science.aaa1605

Brietburg et al. 2015. And on top of all that...Coping with ocean acidification in the midst of many stressors. *Oceanogr.* 28(2): 48-61.

Elder, L. E. and **B. A. Seibel**. 2015. Thermal stress response to diel vertical migration in the hyperiid amphipod, *Phronima sedentaria*. *Comp. Biochem. Physiol. A*. 187: 20-26. doi:10.1016/j.cbpa.2015.04.008.

Elder, L. E. and **B. A. Seibel**. 2015. Ecophysiological implications of vertical migration into oxygen minimum zones for the hyperiid amphipod, *Phronima sedentaria*. *J. Plankton Res.* 0: 1-15. doi:10.1093/plankt/fbv066.

Seibel, B. A. 2015. Environmental physiology of the jumbo squid, *Dosidicus gigas*: Implications for changing climate. *Amer. Mal. Bull.* 33: 1-13

Marko, P. B., Carrington, E., Rosa, R., Giomi, F., Troschinski, S., and **B. A. Seibel**. 2015. Symposium on "Climate change and molluscan ecophysiology" at the 79th Annual Meeting of the American Malacological Society. *Amer. Mal. Bull.* 33, 1-6.

Carey, S. et al. 2014. Cold Seeps Associated with a Submarine Debris Avalanche Deposit at Kick'em Jenny Volcano, Grenada (Lesser Antilles). *Deep-Sea Res.* 93: 156-160.

Maas, A. E., S. Frazar, D. Outram, B. A. Seibel and K. J. Wishner. 2014. Fine-scale vertical distribution of macroplankton and micronekton in an Eastern Tropical North Pacific in association with an oxygen minimum zone. *J. Plankton Res.* (2014) 0(0): 1-19. doi:10.1093/plankt/fbu077

Trueblood, L. A. and **Seibel, B. A.** 2014. Slow swimming, fast strikes: the advantage of tentacles for squids in 'competition' with fishes. *J. Exp. Biol.* 217, 2710-2716

Seibel, B. A., Häfker, S., Trübenbach, K., Zhang, J., Pörtner, H. O., Rosa, R. and Storey, K. B. 2014. Energy metabolism during hypoxic exposure in an oxygen minimum zone squid, *Dosidicus gigas*. *J. Exp. Biol.* 217, 2555-2568

Robison, B. H., Drazen, J. C., and **Seibel, B. A.** 2014. Protracted egg-brooding in a deep-sea octopus. *PLoS ONE*. 9(7): e103437.

Carey, S., Bell, K. L. C., Ballard, R. D., Roman, C., Dondin, F., Miloslavich, P., Gobin, J., **Seibel, B. A.**, Bell, R., Smart, C., Fuller, S. A., Siu, N., Connally, P., Blake, R., Wishner, K. and B. T. Phillips. 2014. Fluid/Gas Venting and Biological Communities at Kick'em Jenny Submarine Volcano, Grenada (West Indies). *Oceanogr.* 27: 38-41.

- Barry, J. P. Buck, K. R., Lovera, C., Brewer, P. G., Seibel, B. A., Drazen, J. C., Tamburri, M. N., Whaling, P. J., Kuhnz, L., and Pane, E. F. 2013. The response of abyssal organisms to low pH conditions during a series of CO₂-release experiments simulating deep-sea carbon sequestration. *Deep-Sea Res.* 92: 249-260. <http://dx.doi.org/10.1016/j.dsr2.2013.03.037>.
- Wishner, K., Outram, D., Seibel, B. A. and Daly, K. 2013. Zooplankton in the Eastern Tropical North Pacific: Boundary Effects of Oxygen Minimum Zone Expansion. *Deep-Sea Res.* 79: 122-140.
- Seibel, B. A.** and Childress, J. J. 2013. The real limits to marine life: a further critique of the *Respiration Index*. *Biogeosciences*. 10: 1-5.
- Trueblood, L. A. and Seibel, B. A. 2013. Critical depth in the jumbo squid, *Dosidicus gigas* (Ommastrephidae), living in oxygen minimum zones I. Oxygen consumption rates and critical oxygen partial pressures. *Deep-Sea Res. II.* 95: 218-224.
- Seibel, B. A. 2013. Critical depth in the jumbo squid, *Dosidicus gigas* (Ommastrephidae), living in oxygen minimum zones II. Blood-oxygen binding. *Deep-Sea Res. II.* 95: 139-144.
- Trübenbach, K., Pegado, M. R., **Seibel, B. A.**, and Rosa, R. 2013. Ventilation rates and activity levels of jumbo squids under metabolic suppression in the oxygen minimum zone. *J. Exp. Biol.* 216: 359-368.
- Mass, A. E., Wishner, K., and B. A. Seibel. 2012. Metabolic suppression in thecosomatous pteropods as an effect of low temperature and hypoxia in the Eastern Tropical North Pacific. *Mar. Biol.* 159:1955-1967.
- Dymowska, A., Manfredi, T., Rosenthal, J. C., and B. A. Seibel. 2012. Muscle ultrastructure and mitochondrial morphometrics in polar and temperate pteropods (Gymnosomata: Gastropoda). *J. Exp. Biol.* 215: 3370-3378.
- Rosa, R., L. Gonzales, H. M. Dierssen, and B. A. Seibel. 2012. Environmental determinants of latitudinal size trends in cephalopods. *Mar. Ecol. Prog. Ser.* 464: 153-165.
- Maas, A. E., Wishner, K., and **Seibel, B. A.** 2012. The metabolic response of pteropods to ocean acidification reflects natural CO₂-exposure in oxygen minimum zones. *Biogeosciences*. 9: 747-757.
- Mass, A. E., Seibel, B. A., and Walsh, P. J. 2012. Effects of Elevated Ammonia Concentrations on Survival, Metabolic Rates and Glutamine Synthetase Activity in the Antarctic Pteropod Mollusc *Clione limacine antarctica*. *Polar Biol.* DOI: 10.1007/s00300-012-1158-7.
- Seibel, B. A., Maas, A. E., and Dierssen, H. M. 2012. Energetic plasticity underlies variable response to ocean acidification in the Antarctic pteropod, *Limacina helicina*. *PLoS One*. 7: e30464.
- Maas, A. E., Elder, L. E., Dierssen, H. M. and **Seibel, B. A.** 2011. The metabolic response of Antarctic pteropods (Mollusca: Gastropoda) to food deprivation and regional productivity. *Marine Ecol. Prog. Ser.* 441: 129-139.
- Seibel, B. A. 2011. Critical oxygen levels and metabolic suppression in oceanic oxygen minimum zones. *J. Exp. Biol.* 214: 326-336.
- Hunt, B., Strugnell, J., Allcock, L., Bednarsek, N., Linse, K., Nelson, R. J., Pakhomov, E., Seibel, B. A., Steinke, D., and Würzberg, L. 2010. Poles apart: “Bipolar” pteropod species are genetically distinct. *PLoS One* 5(3): 1-4.
- Rosa, R. and Seibel, B. A. 2010. Living on the surface: the physiological demands and ecological tradeoffs of an epipelagic existence in paper nautilus, *Argonauta nouryi*. *ICES J. Mar. Science.* 67: 1494-1500.
- Rosa, R., and Seibel, B. A. 2010. Slow pace of life of the Antarctic colossal squid. *J. Mar. Biol. Ass. U. K.* 90: 1375-1378.

- Rosa, R., and Seibel, B. A. 2010. Metabolic physiology of the Humboldt Squid, *Dosidicus gigas*: implications for vertical migration in a pronounced oxygen minimum zone. *Prog. Oceanogr.* 86: 72-80.
- Seibel, B. A., Girguis, P. R., and Childress, J. J. 2009. Variation in evolved “limits to life” preclude universal tolerance indices: a critique of the “Respiration Index”. *Science* (e-Letters) <http://www.sciencemag.org/cgi/eletters/324/5925/347#12814>.
- Rosenthal, J. C., Seibel, B.A., Dymowska, A., and F. Bezanilla. 2009. Trade-off between aerobic capacity and locomotory activity in an Antarctic pteropod. *Proc. Natl. Acad. Sci.* 106: 6192-6196.
- Seibel, B. A. and Dierssen, H. M. 2009. Perspective: Animal function at the heart (and gut) of oceanography. *Science.* 323(5912): 343-344
- Rosa, R., Trueblood, L. A., and B. A. Seibel. 2009. Ecophysiological demands on scaling of aerobic and anaerobic metabolism of deep-sea gonatid squids. *Physiol. Biochem. Zool.* 82(5). DOI 10.1086/591950.
- Childress, J. J., Seibel, B. A., and Thuesen, E. V. 2008. Copepod metabolism data support “locomotor decline” and “visual interactions” hypotheses for the decline in metabolic rates of pelagic animals with image-forming eyes. Comment on Ikeda et al. *Mar. Ecol. Prog. Ser.* 373: 187-191.
- Rosa, R., and Seibel, B. A. 2008. Synergistic effect of climate-related variables suggests future physiological impairment in a top oceanic predator. *Proc. Nat. Acad. Sci.* 52. 20776-20780.
- Rosa, R., Dierssen, H. M., Gonzales, L., and **B. A. Seibel.** 2008. Large-scale diversity patterns of cephalopods in the open ocean and deep-sea. *Ecology.* 89: 3449-3461.
- Rosa, R., Dierssen, H. M., Gonzales, L., and **B. A. Seibel.** 2008. Ecological biogeography of cephalopod mollusks in Atlantic Ocean. Historical and contemporary causes of coastal diversity patterns. *Global Ecol. Biogeogr.* 17: 600-610.
- D. J. Staaf, S. Camarillo-Coop, S. H. D. Haddock, A. C. Nyack, J. Payne, R. Ramirez-Rojo, C. A. Salinas-Zavala, **B. A. Seibel,** L. Trueblood, C. Widmer, W. F. Gilly. 2008. Natural egg deposition by the Humboldt squid (*Dosidicus gigas*) in the Gulf of California and characteristics of paralarvae. *J. Mar. Biol. Ass. U.K.* 88: 759-770.
- Fabry, V. J., **Seibel, B. A.,** Feely, R. A., and Orr, J. C. 2008. Impacts of Ocean Acidification on Marine Fauna and Ecosystem Processes. *ICES J. Mar. Sci.* 65: 414-432.
- Aronson, R., Thatje, S., Clarke, A., Peck, L. S., Blake, D. B., Wilga, C. D., and Seibel, B. A. 2007. Climate change and invisibility of the Antarctic Benthos. *Annu. Rev. Ecol. Evol. Syst.* 38: 129-154.
- Caldeira, K. et al. (25 authors). 2007. Comment on “Modern-age buildup of CO₂ and its effects on seawater acidity and salinity. *Geophys. Res. Lett.* 34: L18608, doi: 10.1029/2006GL027288.
- Seibel, B. A., Dymowska, A., Rosenthal, J. C. 2007. Metabolic temperature compensation and coevolution of locomotory capacity in pteropod molluscs. *Integr. Comp. Biol.* 47: 880-891.
- Drazen, J. C. and Seibel, B. A. 2007. Depth-related trends in metabolism of benthic and benthopelagic fishes. *Limnol. Oceanogr.* 52: 2306-2316.
- Seibel, B. A. and Drazen, J. C. 2007. The rates of metabolism in marine animals: environmental constraints, ecological demands and energetic opportunities. *Phil. Trans. Roy. Soc. Lond. B.* 362: 2061-2078.

- Samerotte, S. L., J. C. Drazen, G. L. Brand, B. A. Seibel, and P. H. Yancey. 2007. Correlation of trimethylamine oxide and habitat depth within and among species of teleost fishes: an analysis of causation. *Physiol. Biochem. Zool.* 80(2): 197-208.
- Seibel, B. A. 2007. On the depth and scale of metabolic rate variation: scaling of oxygen consumption and enzymatic activity in the Class Cephalopoda. *J. Exp. Biol.* 210: 1-11.
- Seibel, B. A., Robison, B. H., Haddock, S. D. H. 2005. Post-spawning egg-care by a squid. *Nature* 438: 929.
- Wishner, K. F., J. R. Graff, J. W. Martin, S. Carey, H. Sigurdsson, and B. A. Seibel. 2005. Are midwater shrimp trapped in the craters of submarine volcanoes by hydrothermal venting? *Deep-Sea Res.* 152: 1528-1535.
- Seibel, B. A., S. K. Goffredi, E. V. Thuesen, J. J. Childress, and B. H. Robison. 2004. Ammonium content and buoyancy in midwater cephalopods. *J. Exp. Mar. Biol. Ecol.* 313: 375-387.
- Seibel, B. A. and H. M. Dierssen. 2003. Cascading trophic impacts of reduced biomass in the Ross Sea, Antarctica: just the tip of the iceberg? *Biol. Bull.* 205 (2): 93-99.
- Seibel, B. A. and P. J. Walsh. 2003. Biological impacts of deep-sea carbon dioxide injection inferred from indices of physiological performance. *J. Exp. Biol.* 206: 641-650.
- Barry, J.P., B.A. Seibel, J.C. Drazen, M.N. Tamburri, K.R. Buck, et al. 2003. Deep-sea field experiments on the biological impacts of direct deep-sea CO₂ injection. Proceedings of the Second Annual Conference on Carbon Sequestration, Alexandria, Virginia. pp. 1-7. (Extended Abstract).
- Seibel, B. A. and P. J. Walsh. 2002. Trimethylamine oxide accumulation in marine animals: relation to acylglycerol storage? *J. Exp. Biol.* 205(3): 297-306.
- Seibel, B. A. and P. J. Walsh. 2002. Minimizing effects of CO₂ storage in oceans - Response (letters). *Science* 295(5553): 276.
- Seibel, B. A. and P. J. Walsh. 2001. Potential impacts of CO₂ injection on deep-sea biota. *Science.* 294(5541): 319-320.
- Seibel, B. A. and D. B. Carlini. 2001. Metabolism of pelagic cephalopods as a function of habitat depth: a reanalysis using phylogenetically independent contrasts. *Biol. Bull.* 201(1): 1-5.
- Seibel, B. A., F. G. Hochberg, and D. B. Carlini. 2000. Life history of *Gonatus onyx* (Cephalopoda: Teuthoidea): deep-sea spawning and post-spawning egg care. *Mar. Biol.* 137(3): 519-526
- Seibel, B. A. and J. J. Childress. 2000. Metabolism of benthic octopods (Cephalopoda) as a function of habitat depth and oxygen concentration. *Deep-Sea Res.* 47(7): 1247-1260
- Seibel, B. A., E. V. Thuesen and J. J. Childress. 2000. Light-limitation on predator-prey interactions: consequences for metabolism and locomotion in deep-sea cephalopods. *Biol. Bull.* 198: 284-298.
- Hunt, J. C. and B. A. Seibel. 2000. Life history of *Gonatus onyx* (Cephalopoda: Teuthoidea): ontogenetic changes in habitat, behavior and physiology. *Mar. Biol.* 136(3): 543-552.
- Seibel, B. A., F. Chausson, F. Lallier, J. J. Childress and F. Zal. 1999. Vampire blood: respiratory physiology of the Vampire Squid (Vampyromorpha: Cephalopoda) in relation to the oxygen minimum layer. *Experimental Biology Online.* 4(1).
- Archipkin, A. and B. A. Seibel. 1999. Statolith microstructure from hatchlings of the oceanic squid, *Gonatus onyx* (Cephalopoda, Gonatidae) from the Northeast Pacific. *J. Plankton Res.* 21(2): 401-404.

- Seibel, B. A., E. V. Thuesen and J. J. Childress. 1998. Flight of the Vampire: ontogenetic gait-transition in *Vampyroteuthis infernalis* (Cephalopoda: Vampyromorpha). *J. Exp. Biol.* 201(16): 2413-2424.
- Childress, J. J. and B. A. Seibel. 1998. Life at stable low oxygen: Adaptations of animals to oceanic oxygen minimum layers. *J. Exp. Biol.* 201: 1223-1232.
- Seibel, B.A., E. V. Thuesen, J. J. Childress, and L. A. Gorodezky. 1997. Decline in pelagic cephalopod metabolism with habitat depth reflects differences in locomotory efficiency. *Biol. Bull.* 192: 262-278.
- Seibel, B. A. and J. J. Childress. 1996. Deep-breathing cephalopods? *Nature.* 384: 421 (Corresp.).

MANUSCRIPTS IN PREPARATION OR SUBMITTED

- Seibel, B. A., Schneider, J., Wishner, K., Kaartvedt, S., and K., Daly. Compression of nighttime habitat depth in oxygen minimum zone euphausiids: implications for ocean deoxygenation. Submitted to *Integr. Comp. Biol.*
- Bockus, A. and **B. A. Seibel**. Trimethylamine oxide and lipid levels increase with depth in Hawaiian midwater fishes. Submitted to *Deep-sea Res.*
- Carey, S. et al. Hydrothermal Venting and Mineralization in the Crater of Kick'em Jenny Submarine Volcano, Grenada (Lesser Antilles). Submitted to *Geochemistry, Geophysics, Geosystems (G3)*.
- Nyack, A., R. Henry, and **B. A. Seibel**. Carbonic anhydrase in nektonic squids: relationship to habitat and lifestyle. Submitted to *Comp. Biochem. Phys. Part A*.
- Bockus, A. B. and **B. A. Seibel**. Ontogenetic osmotic shift and osmoregulatory divergence in spiny dogfish, *Squalus acanthias*. Submitted to *Journal Experimental Biology*.
- Nyack, A. and **B. A. Seibel**. Carbonic anhydrase activity in cephalopod gills correlates with metabolic rate: implications for ocean acidification tolerance. Submitted to *Biol. Bull.*
- Birk, M. A. and **B. A. Seibel**. In situ observations of egg masses of *Dosidicus gigas* (Ommastrephidae: Cephalopoda). In preparation for *Biological Bulletin*.
- Elder, L. E. and **B. A. Seibel**. Metabolism in Amphipoda as a function of temperature, body mass and predation strategy. In prep. for *Mar. Ecol. Prog. Ser.*
- Seibel, B. A.**, Haddock, S., Johnsen, S., and B. H. Robison. A bioluminescent "halo" in a sea angel: (Pteropoda: Gymnosomata) from bathypelagic waters. In prep. for *Biol. Bull.*
- Bockus, A., Saba, G., Shaw, C. T. and **B. A. Seibel**. Acid-base regulation and metabolism in Antarctic krill, *Euphausia superba*, in response to elevated carbon dioxide and temperature. In prep. for *ICES Journal of Marine Science*.
- Saba, G. E., Shaw, C. T., Bockus, A. B. and **B. A. Seibel**. Growth and nutrient excretion rates in Antarctic krill in response to elevated carbon dioxide and temperature. In prep for *ICES Journal of Marine Science*.
- Birk, M., McLean, E., and **B. A. Seibel**. Critical oxygen levels in the long-fin squid, *Doryteuthis pealeii*, as a function of temperature and carbon dioxide levels. In prep. for *J. Exp. Biol.*
- McLean, E. and **B. A. Seibel**. Effect of ocean acidification on growth and energetics in juvenile lobster. In prep. for *Biogeosciences*.

PRESENTATIONS

- 2016 *Cephalopod susceptibility to asphyxiation via ocean incalescence, deoxygenation and acidification.* UNC Charlotte. Invited Seminar.
- 2016 *Physiology of vertical migrators in oxygen minimum zones.* Society for Integrative and Comparative Biology. Invited symposium speaker.
- 2015 *Predicting the response of marine organisms to climate change.* Scripps Institute of Oceanography. Invited seminar.
- 2015 *Predicting the response of marine organisms to climate change.* Rutgers University. Invited seminar.
- 2015 Palmer Station, Antarctica. Science Talk. *Euphausiid susceptibility to ocean acidification?*
- 2015 Society of Integrative and Comparative Biology. *The “Out of Classroom” Experience: Teaching Marine Biology at the University of Rhode Island.* Webb, J., Seibel, B. and Hobbs, N.-V.
- 2014 *Physiological indices of environmental tolerance.* Horn Point Laboratory, Invited seminar.
- 2014 First Ocean Global Change Biology Gordon Research Conference. *Critical depth: integrating the physiological responses to deoxygenation, warming and acidification in vertically mobile marine animals,* Invited Speaker.
- 2014 First Ocean Global Change Biology Gordon Research Conference. The synergistic effects of ocean acidification and warming on Antarctic Krill (*Euphausia superba*): Acid-base balance, metabolism and growth. Bockus, A., Saba, G., and B. A. Seibel.
- 2013 World Congress of Malacology, Azores. *Symposium on Climate Change and Molluscan Ecophysiology,* Co-organizer and speaker.
- 2013 University of South Florida. *Egg development and parental care in deep-sea animals.*
- 2013 Amer. Soc. Limnol. Oceanogr., New Orleans, co-organizer and speaker for: *Oxygen minimum zones and climate change.*
- 2012 PICES Symposium on Effects of natural and anthropogenic stressors in the North Pacific ecosystems: Scientific challenges and possible solutions. *Critical oxygen levels in expanding oxygen minimum zones.* Hiroshima, Japan, Invited Lecture.
- 2012 Scripps Institute of Oceanography, Invited Lecture.
- 2012 Norwegian University of Science and Technology, Invited Lecture.
- 2012 Amer. Soc. Limnol. Oceanogr., Salt Lake City, Utah. Co-Organizer and speaker for: *Adaptation to High CO₂ Oceans: From Experimental Evolution to Naturally CO₂ Rich Habitats.*
- 2011 IFM-Geomar, Kiel, Germany, Invited Lecture.
- 2011 NordCEE (Center for Earth Evolution), University of Odense, Denmark, Invited Lecture.
- 2011 Eur-Oceans Conference on Ocean Deoxygenation. Round-table discussion on the “Respiration Index”. (Invited).
- 2011 European Geophysical Union, Ocean acidification in polar oceans.
- 2011 URI Honors Colloquium, Vetlesen Lecture Series. The State of our Oceans. *Ocean Acidification: The ‘other CO₂ problem’* (Invited).
- 2011 IPCC, Ocean Acidification Workshop, Invited participant and poster presentation.

- 2011 5th Conference on Zooplankton Production, Pucon, Chile, Symposium on Ocean Acidification, *Zooplankton response to ocean acidification: knowns, unknowns and the unknowable*. (Invited).
- 2010 Amer. Soc. Limnol. Oceanogr., Portland. (Contributed talks, 4).
- 2010 Company of Biologists, Symposium on Biology of Energy Expenditure, *Metabolic suppression in oceanic oxygen minimum zones* (Invited).
- 2010 Amer. Physiol. Soc. - Global change and global science: Comparative physiology in a changing world, *Oceanic animals in expanding oxygen minimum zones*, Invited Speaker.
- 2009 University of Maine, Department of Marine Science, Invited Lecture.
- 2009 University of South Florida, Department of Marine Science, Invited Lecture.
- 2009 University of California, Berkeley. Hansen Lecture in Integrative Biology. *Hypoxia and the physiology, ecology and behavior of the jumbo squid*, Dosidicus gigas (Invited).
- 2009 Amer. Soc. Limnol. Oceanogr., Nice, France. Co-Organizer and speaker for Symposium: Biology and Biogeography of Oceanic Oxygen Minimum Zones.
- 2008 Brown University, Department of Ecology and Evolution, Invited lecture.
- 2008 Amer. Soc. Limnol. Oceanogr., *Metabolic response to ocean acidification*.
- 2008 Amer. Soc. Limnol. Oceanogr., Contributed co-authored poster.
- 2008 AAAS, Boston, Co-authored talk, *Climate change and invasibility of the Antarctic benthos*.
- 2008 Soc. Integr. Comp. Biol., Contributed co-authored talks (2).
- 2007 GLOBEC-CLIOTOP, Climate impacts on oceanic predators, La Paz, Mexico, Contributed talk.
- 2007 OCB Scoping Workshop for Ocean Acidification Research, San Diego, CA, Invited plenary.
- 2007 World Congress of Malacology, Antwerp, Belgium, Contributed co-authored talk.
- 2007 Soc. Integr. Comp. Biol, Contributed co-authored talks (3).
- 2006 Symposium: APS Comparative Physiology. Symposium on Fuel Selection. *Fuel selection in vertically migrating zooplankton*. (Invited).
- 2006 CLIOTOP: Squid as predators in oceanic ecosystems. *Vertical migration in jumbo squid* (Invited).
- 2006 Scripps Institute of Oceanography, *Metabolic rates of marine animals* (Invited).
- 2006 Gordon Research Conference, Metabolic basis of ecology. *On the depth and scale of metabolic rate variation*.
- 2006 Amer. Soc. Limnol. Oceanogr. Contributed poster.
- 2006 Soc. Integr. Comp. Biol. Contributed co-authored talk.
- 2005 Society for Experimental Biology. Symposium on Environmental constraints on locomotion. *The rates of metabolism in marine animals: environmental constraints, ecological demands and energetic opportunities* (Invited).
- 2005 SUNY, Stonybrook, Invited Lecture.
- 2005 UMass Boston, Invited Lecture.
- 2005 IUPS Physiological Congress, San Diego. *Metabolic scaling in cephalopods* (Invited).
- 2004 Deep-sea Fisheries Symposium, Ocean Life Institute, WHOI, Contributed talk.

- 2004 University of Connecticut Avery Point Marine Laboratory (Invited).
- 2004 Graduate School of Oceanography, University of Rhode Island (Invited).
- 2003 10th Deep-sea Biology Symposium, Oregon Coast, Contributed co-authored talk.
- 2003 Amer. Soc. Limnol. Oceanogr., Salt Lake City, Utah, Contributed talk.
- 2002 Western Society of Naturalists, Monterey, CA, Contributed talk.
- 2002 Evergreen State College, Olympia Washington, Invited Lecture.
- 2002 McMurdo Station, Antarctica, Science Lecture Series, Invited Lecture.
- 2001 Amer. Geophys. Union, Eos Trans. AGU, Contributed co-authored talk.
- 2001 Moss Landing Marine Laboratories, Invited Lecture.
- 2001 Amer. Soc. Limnol. Oceanogr., Contributed talk.
- 2001 University of British Columbia, Canada, *Metabolic cold adaptation* (Invited).
- 2001 California State University, San Marcos, *Marine biotic response to CO₂* (Invited).
- 1999 Santa Clara University, CA, Invited Lecture.
- 1999 5th International Congress Physiology, Calgary, *Scaling in marine animals* (Invited).
- 1998 Roscoff Biological Station, France, *Biology of Vampyroteuthis infernalis* (Invited).
- 1997 Amer. Soc. Naturalists, La Paz, Mexico, Contributed talk.
- 1997 Deep-sea Biology Symposium, Monterey, California, Contributed talk.
- 1998 Company of Biologists Special Symposium, Monterey, CA, co-authored: *Life in stable low oxygen: adaptations of animals to oceanic oxygen minimum layers* (Invited).

TEACHING EXPERIENCE

- 2003-2013 University of Rhode Island, Department of Biological Sciences, Kingston, RI
1. *Pelagic Ecology* (New Course: at sea aboard the *R/V Endeavor*)
 2. *Invertebrate Zoology*
 3. *Marine Biology* (60 students each semester)
 4. *Introduction to Marine Biology*
 5. *Marine Environmental Physiology*
 6. *Comparative Physiology* (Repeating graduate course, various topics)
 7. *Biological Oceanography* (Repeating graduate course, various topics)
 8. *Advanced Ecology* (Graduate Course)
 9. *Human Physiology Lecture and Laboratory* (250 students)
- 1995-1996 Moorpark College, Department of Science and Engineering, Moorpark, CA
1. *Marine Life and Environment*, Instructor (25 students)
 2. *Principles of Biology*, Instructor (70 students)
- 1995-1998 University of California, Santa Barbara, Ecology, Evolution and Marine Biology, Santa Barbara, CA
1. *Integrative Physiology*, Teaching Assistant
 2. *Deep-sea Biology*, Teaching Assistant

UNDERGRADUATE MENTORING AND ADVISING

- 2003-present Undergraduate advising, 30+ students each semester at URI
- 2014 Hosted workshops on *How to apply to Graduate School*.
- 2013 Worked with applicants on application essays for NOAA Hollings Scholarship awardees (Katharine Egan, Emily Bishop, and Nicole Marone, and finalist, Emily Thomsen) for the

prestigious, nationally competitive scholarships (2 years scholarship and summer internship at a NOAA lab).

2010-present	Mentored Undergraduate Laboratory Assistants (15 students)
2003-2010	Mentored Undergraduate Students in Independent Studies Projects (8 students)
2010	Advised Undergraduate Honors Project (Kristina Camarena)
2004	Advised Senior Honors Thesis Project (Anne Farahi)

GRADUATE AND POSTDOCTORAL MENTORING

Degrees Conferred

- Leanne Elder, Ph.D. Conferred 2013, Major Advisor
- Al Nyack, Ph.D. Conferred 2013, Major Advisor
- Kathleen Turner, MS conferred 2013, GSO, Committee Member
- Rebecca Williams, Ph.D. Conferred, 2013, Committee Member
- Paul Suprenand, Ph.D. Conferred 2013, Univ. South Florida, Committee Member
- Jack Szczepanski, Ph.D. conferred 2012, Committee Member
- Jason Ramsay, Ph.D. conferred 2012, Committee Member
- Amy Maas, Ph.D. conferred 2011, Major Advisor
- Christine Cass, Ph.D. Conferred 2011, Univ. South Florida, Committee Member
- Shannon Gerry, Ph.D. conferred 2010, Committee Member
- Lloyd Trueblood, Ph.D. conferred 2010, Major Advisor
- Jason Graff, Ph.D. conferred 2010, Committee Member
- Jocelyn Dolce, MS conferred 2009, Committee Member
- Sarah Marnell, MS conferred 2008, Major Advisor
- Howard Chang, Ph.D. conferred 2007, Committee Member
- Agnieszka Dymowska, MS conferred 2006, Major Advisor
- Jay Dimond, MS conferred 2006, Committee Member
- Debra Petrak, Ph.D. conferred 2006, Committee Member
- Lindsay Sullivan, Ph.D. conferred 2006, Committee Member
- Kate Hagstrom, Ph.D. conferred 2006, Committee Member
- Mary Rapien, Ph.D. conferred 2005, Committee Member
- Leslie Gillon, MS. conferred 2005, Committee Member
- Ladd Rutheford, MS. conferred 2005, Evergreen State College, Committee Member

Continuing Students

- Brennan Phillips, Ph.D. student, GSO, Committee Member
- Abigail Bockus, PhD student, current, Major Advisor
- Mathew Birk, Ph.D. student, current, Major Advisor
- Erin McClean, Ph.D. student, current, Major Advisor

Postdoctoral Researchers

- Dr. Agnieszka Dymowska, Postdoctoral Researcher 2015-16, Major Advisor
- Dr. Rui Rosa, Postdoctoral Researcher 2006-09, Major Advisor
- Dr. Stephanie Bush, Postdoctoral Fellow 2010-12, Major Advisor

ADMINISTRATIVE ACTIVITIES

- Faculty search committee member, *Biology Department Chair*, 2014
- Faculty search committee member, *Teaching Specialist in Biology*, 2014.
- Space Allocation Committee, College of Environment and Life Sciences.
- Dive Control Board, Member, 2012.
- IEB Graduate Committee, 2012-2014.
- Administered 9 major grants (NSF and ONR) totaling ~\$3.0M.
- Lead research expeditions to remote locations with dozens of participating organizations.
- Seawater oversight committee, Graduate School of Oceanography, 2014.
- Chair, faculty search committee, *Global Change Biologist*, 2011.
- Co-authored Strategic Plan for Biology Department Research Activities, 2010.

- Developed Outcomes Assessment program for Biology Department, 2008.
- Human Anatomy/Physiology revision committee, 2004.
- Graduate Committee, 2005-2008.
- Budget Committee, 2008, 2010.
- Faculty search committee member, *Senior Marine Biologist*, 2005
- Small boat oversight committee, 2005.
- Seawater system revision oversight committee, 2004.
- Committee to evaluate URI 101, University-wide introductory course, 2007.

SCHOLASTIC ACTIVITIES AND ACADEMIC COMMUNITY SERVICE

- GO₂Ne, Global Ocean Oxygen Network. Intergovernmental Oceanographic Commission – Ocean Science Section. UNESCO
- Councilor-at-large, American Malacological Society, 2014-2017
- NSF Proposal Review Panelist, 2014.
- Participated in the NSF- Ocean Acidification PI workshop, 2013.
- Invited public lecture: Vetlesen Lecture Series on the State of our Oceans, Univ. Rhode Island.
- Intergovernmental Panel on Climate Change: Ocean Acidification Workshop, Japan, January 2011.
- Contributed to the Ocean Carbon and Biogeochemistry FAQs about ocean acidification (www.epoca-project.eu/index.php/FAQ.html).
- Instructor for the OCB short course on ocean acidification, Woods Hole, MA.
- Reviewed the Congressional Research Service Report on Ocean Acidification.
- Plenary speaker and participant in NSF (OCB)-sponsored workshop: *Ocean acidification*.
- Antarctic Biology Course workshop, Catalina Island, 2003.
- Department of Energy workshop on ocean disposal of carbon dioxide, MBARI, 2000.
- Refereed papers and proposals for more than a dozen journals and funding agencies.
- Gordon Research Conference on the *Metabolic Basis of Ecology*, July 2006.

PUBLIC AND COMMUNITY OUTREACH

- Robison et al. 2014 featured in Discover Magazine's top 100 science discoveries of 2014.
- Co-PI, PARKA (Planting Antarctica in Kansas) Project. COSEES education program, 2013-2014.
- Ocean acidification webcast, *Jason Project*, 2013.
- Invited participant, Rhode Island Environmental Leaders Day (hosted by Senator Whitehouse), 2013, 2014.
- Biologists, *EV Nautilus Exploration Program and Ocean Exploration Trust*, 2012-2013.
- Invited lecture on deep-sea biology, Rhode Island Power Squadron, 2013.
- Invited lecture on extreme environments, Paul Cuffee School, Providence 2012-2013.
- Invited lecture on ocean acidification, America's Cup, 2012.
- Invited lecture on deep-sea biology, Harris Elementary School, Woonsocket, RI.
- Invited lecture on ocean acidification, the Lincoln Public Library, Lincoln, RI, 2010.
- Organized *Diversity Week* activities for the College of Environment and Life Sciences, URI.
- Invited lecture on extreme environments, Roger Williams Zoo, Docent Training Program, 2010.
- Invited lecture on extreme environments, Gilbert Middle School, Warwick, Rhode Island.
- Organized marine science field trip for Westerly Public Schools (Tower Street School Kindergarten).
- Invited lecture on deep-sea biology, Rhode Island Rotary Club.
- Scientific Advisor for Exhibit, *The Deep* (Claire Nouvian, curator). Paris Museum of Natural History.
- Research featured in dozens of news outlets including the *New York Times*, *San Francisco Chronicle*, *Science News*, *BBC World News*, *Discover Channel*, *National Public Radio*, and *National Geographic*.
- Contributed to children's encyclopedia, Seibel, B. A. *Octopuses, Squids and Other Cephalopods*, in *The New Book of Knowledge* Grolier, Scholastic, Danbury, CT, 2004.
- Instructor, *Marine Environment*, Senior Summer School, Santa Barbara, CA, 1996.
- Contributed photographs and text to many books and websites.

PROFESSIONAL ASSOCIATIONS

- American Malacological Society
- American Society of Limnology and Oceanography
- American Physiological Society
- Society for Integrative and Comparative Biology

REFERENCES

Graduate Advisor and Comparative Physiologist

Dr. James J. Childress
Professor of Ecology, Evolution and Marine Biology
University of California, Santa Barbara
childres@lifesci.ucsb.edu

Graduate Committee Member and Comparative Biochemist

Dr. Raul K. Suarez
Professor of Ecology, Evolution and Marine Biology
University of California, Santa Barbara
suarez@lifesci.ucsb.edu

Postdoctoral Advisor and Comparative Physiologist

Dr. Patrick J. Walsh
Professor, Department of Biology
Canada Research Chair, Environmental Health and Genomics
Centre for Advanced Research in Environmental Genomics (CAREG)
University of Ottawa, 30 Marie Curie, Ottawa, ON K1N 6N5, Canada
pwalsh@uottawa.ca

Postdoctoral Advisor and Biological Oceanographer

Dr. Bruce Robison
Senior Scientist
Monterey Bay Aquarium Research Institute
Moss Landing, CA
robr@mbari.org

Collaborator and Biological Oceanographer

Dr. Karen Wishner
Professor, Graduate School of Oceanography
University of Rhode Island, Narragansett, RI
kwishner@gso.uri.edu

Collaborator and Animal Biologist

Dr. Sönke Johnsen
Professor, Biological Sciences
Duke University
sjohnsen@duke.edu

Collaborator and Comparative Biochemist

Dr. Kenneth B. Storey
Canada Research Chair in Molecular Physiology and Professor of Biochemistry
Carleton University, Dept. of Biology or Dept. of Chemistry
1125 Colonel By Drive, Ottawa, Ontario, Canada K1S 5B6
kenneth_storey@carleton.ca

Collaborator and Marine Ecologist

Dr. Ron K. O'Dor
Senior Scientist, Census of Marine Life, CORE
Suite 420, 1201 New York Ave. NW, Washington, DC 20005
rodor@coreocean.org