

CURRICULUM VITAE

Karen F. Wishner

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Education

Ph.D. in Oceanography, University of California, San Diego, Scripps Institution of Oceanography
B.A. in Biology with Honors, University of Chicago

Awards

National Merit Scholar
National Science Foundation Predoctoral Fellowship
Fellow, American Association for the Advancement of Science (AAAS) (1995)

Professional Experience

1993-Present	Professor	University of Rhode Island, Graduate School of Oceanography, Narragansett, Rhode Island
2001	Visiting Scientist	Observatoire Oceanologique, Station Zoologique, Villefranche-sur-Mer, France (sabbatical)
1986-1993	Associate Professor	University of Rhode Island, Graduate School of Oceanography, Narragansett, Rhode Island
1990	Visiting Scientist	Institute of Oceanographic Sciences Wormley, England (sabbatical)
1980-1986	Assistant Professor	University of Rhode Island, Graduate School of Oceanography, Narragansett, Rhode Island
1980	Visiting Lecturer	University of California, Santa Cruz
1979	Consultant	PA Engineering, Corte Madera, California
1977-1978	Instructor	Southwestern College, Chula Vista, California
1975-1978	Research Assistant	Dr. John McGowan, Scripps Institution of Oceanography
Summer 1972	Research Assistant	Dr. Thomas Schopf, Marine Biological Laboratory Woods Hole, Massachusetts

Sea Experience Summary

Approximately 25 months sea time including work with Deep Tow, Alvin, MOCNESS, small submersibles, ROVs
Chief scientist or co-chief scientist on 9 cruises: Alvin/Lulu (DOS 1, northwest Atlantic), Alvin/Atlantis II (Santa Catalina Basin), Delta/Powell (Gulf of Maine), Endeavor 174 (SCOPEX, Great South Channel in southern Gulf of Maine), Endeavor 176 (SCOPEX, Great South Channel), Alvin/Atlantis II (Volcano 7, eastern tropical Pacific), Endeavor 196 (SCOPEX 89, Great South Channel), Seward Johnson/Sea Link (Gulf of Maine), Endeavor 301 (GLOBEC, Georges Bank). Co-mentor on 2014 UNOLS Chief Scientist training cruise (Sargasso Sea). Faculty mentor on 2018 Rhode Island Endeavor Program (RIEP) undergraduate Honors cruise
Ships: Endeavor, Melville, Atlantis II, Lulu, Knorr, Agassiz, Gyre, Washington, Cape Hatteras, E.B. Scripps, Delaware II, Powell, Seward Johnson, Discovery II, Thompson, R. H. Brown, Atlantic Explorer, Sikuliaq, E/V Nautilus
Submersibles/ROVs: Alvin, Delta, Johnson Sea Link, Hercules.
Geographic regions: northwest and northeast Atlantic, Gulf Stream and Sargasso Sea, California Borderland, central and equatorial Pacific, mid-ocean ridges, (Atlantic and Pacific), Red Sea,

Antarctic, Gulf of Maine and Georges Bank, Eastern Tropical Pacific, Arabian Sea, underwater volcanos/seamounts (Caribbean, Mexico), regional Rhode Island

Areas of Scientific Interest

Marine zooplankton ecology especially zooplankton distributions and biological – physical interactions, deep-sea biology, mesopelagic biology, oxygen minimum zones, zooplankton and benthos in oxyclines, copepod ecology, whale – zooplankton interactions, seamounts, hydrothermal vents, benthic-pelagic coupling

Professional Organizations

Associated Society of Limnology and Oceanography (ASLO); American Association for the Advancement of Science (AAAS); American Geophysical Union (AGU); The Oceanography Society (TOS)
ASLO: Co-Chair of 1999 ASLO Aquatic Sciences Meeting in Santa Fe, Elected Board Member-at-Large 1996 - 1999 (Member of Awards, Meetings, and Human Resources Committees), Member of URI Organizing Committee for 1986 ASLO meeting (AV Director),
AAAS: Selected as Fellow 1995; Elected Member of Nominating Committee 1991 - 1994

Bibliography (* most significant publications)

- *Wishner, K.F., Seibel, B.A., Roman, C., Deutsch, C., Outram, D., Shaw, C.T., Birk, M.A., Mislán, K.A.S., Adams, T.J., Moore, D., Riley, S. 2018. Ocean deoxygenation and zooplankton: very small oxygen differences matter. *Science Advances*
- Birk, M.A. Mislán, K.A.S., Wishner, K.F., Seibel, B.A. Metabolic adaptations of the pelagic octopod, *Japetella diaphana*, to oxygen minimum zones. *Deep-Sea Research Part I: Oceanographic Research Papers*. In revision 2018
- Seibel, B.A., Wishner, K.F. Mesopelagic community response to deoxygenation. In: IUCN Report: Ocean deoxygenation: everyone's problem. Causes, impacts, consequences and solutions. Invited chapter. In revision 2018
- Ballora, M., Roman, C., Pockalny, R., Wishner, K. 2018. Sonification and science pedagogy: Preliminary experiences and assessments of earth science data presented in an undergraduate general education course. The 24th International Conference on Auditory Display (ICAD 2018), 6 pp.
- Carey, S. Wishner, K. Siebe, C. Kelley, K., Phillips, B., Roman, C. Lubetkin, M., Morales-Dominguez, E. 2018. Exploring and mapping the Revillagigedo Archipelago World Heritage Site in Mexico. *Oceanography (Supplement)* 31(1):44-45.
- *Sutton, T.T., Clarke, M.R., Dunn, D.C., Halpin, P.N., Rogers, A.D., Guinotte, J., Bograd, S.J., Angel, M.V., Perez, J.A.A., Wishner, K., Haedrich, R.L., Lindsay, D.J., Drazen, J.C., Vereshchaka, A., Piatkowski, U., Morato, T., Blachowiak-Samolyk, K., Robison, B.H., Gjerder, K.M., Pierrot-Bults, A., Bernal, P., Reygondeau, G., Heino, M. 2017. A global biogeographic classification of the mesopelagic zone. *Deep-Sea Research Part I* 126:85-102. <http://dx.doi.org/10.1016/j.dsr.2017.05.006>
- *Seibel, B.A., Schneider, J.A., Wishner, K., Kaartvedt, S., and Daly, K. 2016. Hypoxia tolerance and metabolic suppression in oxygen minimum zone euphausiids: Implications for ocean deoxygenation and biogeochemical cycles. *Integrative and Comparative Biology* 56(4): 510-523. doi:10.1093/icb/icw091
- Wishner, K. F. Autobiographical sketch (invited). 2014. Women in Oceanography, a decade later. Special supplement of *Oceanography* 27(4):251.
- *Maas, A., Frazar, S. Outram, D. Seibel, B., and Wishner, K. 2014. Fine-scale vertical distribution of macroplankton and micronekton in the Eastern Tropical North Pacific in

- association with an oxygen minimum zone. *Journal of Plankton Research* 36 (6):1557-1575. doi:10.1093/plankt/fbu077
- *Levin, L.A., K-K Liu, K-C Emeis, D. L. Breitburg, J. Cloern, C. Deutsch, M. Giani, A. Goffart, E.E. Hofmann, Z. Lachkar, K. Limburg, S-M Liu, E. Montes, W. Naqvi, O. Ragueneau, C. Rabouille, S.K. Sarkar, D. Swaney, P. Wassman, and K.F. Wishner. 2015. Comparative biogeochemistry-ecosystem-human interactions on dynamic continental margins. *Journal of Marine Systems* 141:3-17. doi: 10.1016/j.marsys.2014.04.016
- Carey, S., K.L.C. Bell, R.D. Ballard, C. Roman, F. Dondin, P. Miloslavich, J. Gobin, B. Seibel, R. Bell, C. Smart, S.A. Fuller, N. Siu, P. Connally, R. Blake, K. Wishner, and B.T. Phillips. 2014. Fluid/gas venting and biological communities at Kick'em Jenny Submarine Volcano, Grenada (West Indies). *Oceanography (Supplement)* 27 (1):38-41.
- *Williams, R. L., S. Wakeham, R. McKinney, and K. F. Wishner. 2014. Trophic ecology and vertical patterns of carbon and nitrogen stable isotopes in zooplankton from oxygen minimum zone regions. *Deep-Sea Research I* 50:36-47. <http://dx.doi.org/10.1016/j.dsr.2014.04.008>
- *Wishner, K.F., D. M. Outram, B.A. Seibel, K. Daly, and R.L. Williams. 2013. Zooplankton in the Eastern Tropical North Pacific: Boundary effects of oxygen minimum zone expansion. *Deep-Sea Research I* 79:122-140. <http://dx.doi.org/10.1016/j.dsr.2013.05.012>
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- *Robinson, C., D.K. Steinberg, T.R. Anderson, J. Aristegui, C.A. Carlson, J.R. Frost, J-F Ghigliione, S. Hernandez-Leon, G.A. Jackson, R. Koppelman, B. Queguiner, O. Ragueneau, F. Rassoulzadegan, B. H. Robison, C. Tamburini, T. Tanaka, K.F. Wishner, J. Zhang. 2010. Mesopelagic zone ecology and biogeochemistry—a synthesis. *Deep-Sea Research II* 57:1504-1518, doi:10.1016/j.dsr2.2010.02.018, special IMBER Mesopelagic issue
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- *Wishner, K. F., C. Gelfman, M. M. Gowing, D. M. Outram, M. Rapien, and R. L. Williams. 2008. Vertical zonation and distributions of calanoid copepods through the lower oxycline of the Arabian Sea Oxygen Minimum Zone. *Progress in Oceanography* 78:163-191. doi:10.1016/j.pocean.2008.03.001
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- *Wishner, K., L. Levin, M. Gowing, and L. Mullineaux. 1990. Involvement of the oxygen minimum in benthic zonation on a deep seamount. *Nature* 346:57-59.
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- *Wishner, K., E. Durbin, A. Durbin, M. Macaulay, H. Winn, and R. Kenney. 1988. Copepod patches and right whales in the Great South Channel off New England. *Bulletin of Marine Science (Zooplankton Behavior Symposium issue)* 43:825-844.
- Wishner, K. F. and M.M. Gowing. 1987. *In situ* filtering and ingestion rates of deep-sea benthic boundary layer zooplankton in the Santa Catalina Basin. *Marine Biology* 94:357-366.
- *Wishner, K. F. and S. K. Allison. 1986. The distribution and abundance of copepods in relation to the physical structure of the Gulf Stream. *Deep-Sea Research* 33:705-731.
- Allison, S. K. and K. F. Wishner. 1986. Spatial and temporal patterns of zooplankton biomass across the Gulf Stream. *Marine Ecology Progress Series* 31:233-244.
- Gowing, M.M. and K. F. Wishner. 1986. Trophic relationships of deep-sea calanoid copepods from the benthic boundary layer of the Santa Catalina Basin, California. *Deep-Sea Research* 33:939-961.
- Wishner, K. F. and C. J. Meise-Munns. 1984. *In situ* grazing rates of deep-sea benthic boundary layer zooplankton. *Marine Biology* 84:65-74.
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- Wishner, K. F. 1980. Aspects of the community ecology of deep-sea, benthopelagic plankton, with special attention to gymnopleid copepods. *Marine Biology* 60:179-187.
- Wishner, K. F. 1979. The biomass and ecology of the deep-sea benthopelagic (near-bottom) plankton. Ph.D. Thesis, University of California, San Diego. 144 pp.

Recent Presentations at Scientific Meetings (*presenter underlined*)

- Wishner, K., Outram, D., Grassian, B. Habitat parameters for oxygen minimum zone copepods from the Eastern Tropical North Pacific. ASLO Ocean Sciences Meeting 2016, New Orleans, LA, Poster
- Wishner, K., Outram, D. Roman, C. Seibel, B. Shaw, C. Adams, T. Loeb, V. Moore, D., Riley, S. Small-scale biological and physical variability at midwater depths in the Eastern Tropical North Pacific oxygen minimum zone. ASLO/AGU/TOS Ocean Sciences Meeting, Portland OR, 2018.
- Shaw, C.T., Wishner, K., Outram, D., Roman, C. Smith-Mislan, A., Seibel, B. Euphausiid distribution in relation to low oxygen features in the Eastern Tropical Pacific. ASLO/AGU/TOS Ocean Sciences Meeting, Portland OR, 2018.
- Riley, S., Outram, D. Moore, D., Adams, T. Wishner, K. Interactions of euphausiid distributions in the Eastern Tropical North Pacific with the oxygen minimum zone. ASLO/AGU/TOS Ocean Sciences Meeting, Portland OR, 2018. Poster
- Ballora, M., Roman, C., Pockalny, R., Wishner, K. 2018. Sonification and science pedagogy: Preliminary experiences and assessments of earth science data presented in an undergraduate general education course. The 24th International Conference on Auditory Display (ICAD 2018), Michigan Technological University, 2018.
- Davis, C.V., Thunell, R.C., Wishner, K. Depth stratified planktic foraminifera assemblages from the Eastern Tropical North Pacific above and below the oxycline. Forams 2018: International Symposium on Foraminifera. Foraminifera in a Changing World, Session XII: Advances in planktonic foraminiferal ecology and population dynamics. Edinburgh, Scotland, 2018. Poster.
- Wishner, K. Roman, C., Seibel, B. Deutsch, C. Outram, D., Shaw, C.T., Smith-Mislan, A., Birk, M., Moore, D. Riley, S. Potential complexity of zooplankton responses to deoxygenation: very small oxygen differences matter. Conference: Ocean Deoxygenation: Drivers and Consequences Past Present Future, 2018, Kiel, Germany.
- Seibel, B., Deutsch, C., Wishner, K., Roman, C., Mislan, A., Shaw, C.T., Birk, M. Critical oxygen levels of marine animals and the consequences of ocean deoxygenation and warming. Invited, keynote talk, Conference: Ocean Deoxygenation: Drivers and Consequences Past Present Future, 2018, Kiel, Germany.
- Wishner, K., Roman, C., Seibel, B., Deutsch, C., Outram, D., Shaw, C.T., Smith-Mislan, A., Birk, M., Moore, D., Riley, S. Potential complexity of zooplankton responses to deoxygenation: very small oxygen differences matter. 15th Deep-Sea Biology Symposium, 2018, Monterey, CA.
- Haiat Sasson, K., Phillips, B.T., Carey, S., Roman, C.N., Seibe, C., Morales-Dominguez, E., Marsh, L., Wishner, K. Oxygen minimum zones and vertical zonation of benthic fauna in the Revillagigedo Archipelago, Mexico. 15th Deep-Sea Biology Symposium, 2018, Monterey, CA. Poster.
- Birk M.A., Mislan K.A.S., Wishner, K.F., Seibel B.A. How do mesopelagic octopods breathe in the OMZ? Cephalopod International Advisory Council, 2018, Saint Petersburg, FL
- Davis, C.V., Thunell, R.C., Wishner, K. Proxy potential of planktic foraminifera from low oxygen environments. American Geophysical Union, 2018, Washington DC. Poster

Invited Talks (*selected*)

- Involvement of the Oxygen Minimum in benthic zonation on a deep-sea seamount. Institute of Oceanographic Sciences, Deacon Laboratory, Wormley, England, 1990.
- Whale / zooplankton / environment Interactions off Cape Cod. Plymouth Marine Biological Laboratory, Plymouth, England, 1990.

Copepod patches and right whales off the coast of New England, U.S.A. Universidade Federal do Parana, Centro de Estudos do Mar, Pontal do Sul, Brazil, 1994.

Effects of the Oxygen Minimum Zone on zooplankton. Department of Fisheries Science and Technology, College of Agriculture, Sultan Qaboos University, Muscat, Oman, 1995.

Zooplankton in crossovers and tidal fronts: Biological-physical interactions controlling zooplankton input onto Georges Bank (A US GOBEC project). Observatoire Oceanologique, Station Zoologique, Villefranche-sur-Mer, France, 2002

Zooplankton in the Oxygen Minimum Zone. CICESE (Ensenada, Mexico), 2008

Linking mesopelagic microbial and metazoan diversity to function: The metazoan perspective. IMBER IMBIZO Mesopelagic Workshop, Miami, 2008

Plankton, nekton, and biogeochemical boundaries in Oxygen Minimum Zones. Ocean Deoxygenation and Implications for Marine Biogeochemical Cycles and Ecosystems, a EUR-Oceans conference, Toulouse, France, 2011

Oxygen minimum zones, zooplankton layers, and global change. IMBIZO III Conference, Session on Hypoxia and Hypercapnia in Upwelling Systems. National Institute of Oceanography, Dona Paula, Goa, India. 2013

Biogeography and vulnerabilities of deep pelagic ecosystems from a copepod perspective. Global Ocean Biodiversity Initiative (GOBI) Deep Pelagic Biogeography Workshop, Glasgow, Scotland, 2013

Zooplankton ecology in oceanic oxygen minimum zones: Structure, trophic webs, and global change. 46th International Liège Colloquium. Low oxygen environments in marine, estuarine and fresh waters. Liège, Belgium, 2014

Zooplankton ecology in oceanic oxygen minimum zones. Universidad de Concepcion, Chile, Instituto Milenio de Oceanografía, 2014

Zooplankton ecology in oceanic oxygen minimum zones. Universidad de Antofagasta, Chile, 2014

Zooplankton ecology in oceanic oxygen minimum zones: Structure, trophic webs, and climate change. Inter-University Institute for Marine Sciences, H. Steinitz Marine Biology Laboratory, Eilat, Israel, 2015

From Chicago to the deep sea: Zooplankton, oxygen, and climate change. Rowley Honors Symposium, University of Chicago, 2016

Zooplankton and ocean deoxygenation, plus data exploration with sonification. Pennsylvania State University, State College, PA. Arts and Design Research Incubator (ADRI) Lecture Series 2018

Recent News Media and Social Media

Outreach and press related to **RIEP Endeavor cruise (Apr 2018) as part of Honors class HPR230G CSI Oceans**

Youtube video (Gal Jennings) <https://www.youtube.com/watch?v=ydYbSHwUpus>
 Facebook live events (Inner Space Center) (Apr 5, 6, 7): 3 events, over 1700 views as of Apr 20, 2018. <https://www.facebook.com/innerspacecenter>
 Inner Space Center Website: <http://innerspacecenter.org/live-video/endeavor-live/>
 #EndeavorLive hashtag (Inner Space Center) including photos, comments
 Berounsky, V. Not your typical undergraduate class: #EndeavorLive. GSO (B)log, On the Waterfront 5/16/18 and June 10, 2018 (V. 6 (18), v.6 (20)). B(log) v. 1 (4).

Zooplankton species named in my honor by scientists to whom I sent samples

Chaetognath *Heterokrohnia wishnerae* (Casanova 1992)
 Copepod *Parkius karenwishnerae* (Ferrari and Markhaseva 1996)

Professional Activities, Teaching, and Service Summary

Teaching: Undergraduate classes: Deep-Sea Biology, Oceanography, Honors class CSI Oceans, Individual Study. Graduate classes: Biological Oceanography, Marine Plankton, Marine Zooplankton Ecology, Marine Zooplankton, Hydrothermal Vents, Oxygen Minimum Zones, Individual Study

Hands-on training and education at sea and in the lab for undergraduate and graduate students

SURFO mentor (undergraduate NSF REU program), Coastal Fellow mentor

Telepresence K-12 class interactions and media reports with Inner Space Center from E/V Nautilus (Nov 2017) and R/V Endeavor (Apr 2018)

Former graduate students and present position: Stuart Allison, MS (Professor, Knox College, Galesburg, IL), Paul Joyce, PhD (Dean, Sea Education Association (SEA Semester), Woods Hole), Carin Ashjian, PhD (Senior Scientist, WHOI), Lisa Kann, PhD (Senior Scientist, PGDx, Baltimore, MD, biotech industry), Jennifer Saltzman, PhD (Director of Outreach Education, School of Earth Sciences, Stanford University), Mary Rapien, PhD (Faculty, Bristol Community College), Rebecca Williams (community college instructor)

Major funding (mostly NSF): SCOPEX (South Channel Ocean Productivity Experiment), JGOFS: Arabian Sea (Joint Global Ocean Flux Study), Georges Bank GLOBEC, Eastern Tropical Pacific (ETP) Project, National Academies Keck Futures Initiative (NAKFI) Discovering the Deep Blue Sea, Metabolic Index Project

URI ADVANCE grant co-PI (NSF program to increase women science faculty)

Scientific meeting sessions convened and chaired: AGU/ASLO Ocean Sciences Meeting: Chair, Zooplankton I session 1986; Convenor and Chair of special session on Cetacean/Plankton/Ecosystem Interactions 1990, Co-Convenor and Co-Chair of special sessions on Oxygen Minimum Zones at 2009 ASLO Aquatic Sciences Meeting (Nice, FR), 2010 AGU/ASLO/TOS Ocean Sciences Meeting (Portland, OR), 2013 ASLO Aquatic Sciences Meeting (New Orleans, LA). Co-chair and co-organizer of special Deoxygenation sessions (oral and poster) 2018 AGU/ASLO/TOS Ocean Sciences Meeting (Portland, OR)

Journal reviewer for Deep-Sea Research Parts I and II, Limnology and Oceanography, Nature, Marine Ecology Progress Series, Progress in Oceanography, Marine Biology, Ecology, Global Change Biology, Continental Shelf Research, Bulletin of Marine Science, ICES Symposium volumes, Academic Press, Aquatic Living Resources, Hydrobiologia, Indian Journal of Marine Science, Polar Biology, Journal of Plankton Research, African Journal of Marine Science, Journal of Marine Systems, Proceedings of the Royal Society Part B, EOS, Oceanography, Nature Geoscience, Biogeoscience, Conservation Biology, PLOS One, IUCN

Proposal reviewer: NSF, NOAA, scientific agencies of UK, Canada, and Chile

UNOLS: Co-mentor on UNOLS Chief Scientist training cruise, Sargasso Sea, 2014

Co-organizer of UNOLS Chief Scientist Training Event, GSO, 2018