

W. WALDO WAKEFIELD -- CURRICULUM VITAE

Oregon State University
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EDUCATION

Ph.D. Oceanography, Scripps Institution of Oceanography
M.S. Oceanography, Oregon State University
B.S. Biology, Pennsylvania State University

POSITIONS HELD

*Oregon State University College of Earth, Ocean, and Atmospheric Sciences (CEOAS) and
Cooperative Institute for Marine Ecosystem and Resources Studies (CIMERS)*

2018-present: Courtesy Professor, Marine Resource Management Program CEOAS/CIMERS

2002-2018: Courtesy Associate Professor, CEOAS

NOAA / NMFS Northwest Fisheries Science Center

1999-2018: Fisheries Research Biologist, Fishery Resource Analysis and Monitoring Division

Rutgers University Institute of Marine and Coastal Sciences

1998-1999: Assistant Research Professor

1993-1998: Assistant Research Professor and Science Director for Mid-Atlantic Bight National
Undersea Research Center (NOAA's National Undersea Research Program)

University of Alaska Fairbanks

1991-1993: Affiliate Assistant Professor and Science Director for West Coast National
Undersea Research Center (NOAA's National Undersea Research Program)

NOAA/NMFS Southwest Fisheries Science Center

1990-1991: National Research Council, Research Associateship postdoc

Scripps Institution of Oceanography

1982-90: Graduate Research Assistant

Oregon State University, School of Oceanography

1981-1982: Research Assistant; 1978-81: Graduate Research Assistant; 1977-78: Teaching
Assistant

Academy of Natural Sciences of Philadelphia, Division of Limnology and Ecology

1975-1977: Biologist/Principal Investigator, Benedict Estuarine Research Laboratory, Maryland

1973-1975: Research Assistant, stream survey team, ANSP Museum in Philadelphia

AWARDS

- Scripps Institution of Oceanography, Institute of Marine Resources Fellow, 1982-1983
- Fager Memorial Award, Scripps Institution of Oceanography, 1985
- National Research Council, Research Associateship, 1990-1991
- Rutgers University, Faculty Academic Service Increment Program Award for 1994, 1997, 1998

- NOAA NMFS Northwest Fisheries Science Center Certificate of Recognition for Heceta Bank Research Project 1999/2000
- NOAA NMFS Northwest Fisheries Science Center Certificate of Recognition for Ocean Exploration Project off Oregon, 2001
- NOAA 2008 Bronze Medal Award for protecting U.S. west coast essential groundfish habitats via regulations to restrict fishing, buy-out trawlers, and create marine protected areas.

RECENT EXPERIENCE

Research and teaching related to marine habitat ecology and fish habitat assessment, fisheries oceanography, fisheries conservation engineering, and the application of advanced technologies.

AFFILIATIONS WITH PROFESSIONAL SOCIETIES

American Geophysical Union, The Oceanography Society, American Fisheries Society, American Society of Ichthyologists and Herpetologists, American Institute of Fishery Research Biologists, Gilbert Ichthyological Society, Marine Technology Society

PUBLICATIONS

- Shenker, J. M., D. J. Hepner, P.E. Frere, L.E. Currence, and **W.W. Wakefield**. 1983. Upriver migration and abundance of naked goby (*Gobiosoma boscii*) larvae in the Patuxent River, Maryland. *Estuaries* 6: 36-42.
- Wakefield, W.W.** 1984. Feeding relationships within an assemblage of benthic fishes on the Oregon continental shelf. Masters Thesis, Oregon State University.
<https://ir.library.oregonstate.edu/?locale=en>
- Wakefield, W.W.**, and A. Genin. 1987. The use of a Canadian (perspective) grid in deep-sea photography. *Deep-Sea Research* 34:469-478. [https://doi.org/10.1016/0198-0149\(87\)90148-8](https://doi.org/10.1016/0198-0149(87)90148-8)
- Kaufmann, R.S., **W.W. Wakefield**, and A. Genin. 1989. Distribution of epibenthic megafauna and lebensspuren on two Central North Pacific seamounts. *Deep-Sea Research* 36:1863-1896. [https://doi.org/10.1016/0198-0149\(89\)90116-7](https://doi.org/10.1016/0198-0149(89)90116-7)
- Reimers, C.E., and **W.W. Wakefield**. 1989. Flocculation of siliceous detritus on the sea floor of a deep Pacific seamount. *Deep-Sea Research* 36:841-1862. [https://doi.org/10.1016/0198-0149\(89\)90115-5](https://doi.org/10.1016/0198-0149(89)90115-5)
- Wakefield, W.W.**, 1990. Patterns in the distribution of demersal fishes on the upper-continental slope off central California with studies on the role of ontogenetic vertical migration in particle flux. Ph.D. Thesis, Scripps Institution of Oceanography.
- Wakefield, W.W.**, and K.L. Smith, Jr. 1990. Ontogenetic vertical migration in *Sebastolobus altivelis* as a mechanism for transport of particulate organic matter at continental slope depths. *Limnology. Oceanography* 35:1314-1328. <https://doi.org/10.4319/lo.1990.35.6.1314>
- Smith, K.L. Jr., R. S. Kaufmann, and **W. W. Wakefield**. 1993. Mobile megafauna activity monitored with a time-lapse camera in the abyssal North Pacific. *Deep-Sea Research* 40: 2307-2324. [https://doi.org/10.1016/0967-0637\(93\)90106-D](https://doi.org/10.1016/0967-0637(93)90106-D)
- Adams, P.B., J.L. Butler, C.H. Baxter, T. E. Laidig, K. A. Dahlin, and **W. W. Wakefield** 1995. Population estimates of Pacific Coast groundfishes from video transects and swept-area trawls. *Fishery Bulletin* 93:446-455.
- O'Connell, V.M., **W.W. Wakefield**, and H.G. Greene. 1998. The use of a no-take marine reserve in the Eastern Gulf of Alaska to protect essential fish habitat, pp 127-134, *In* M.M.

- Yoklavich (ed.), Marine harvest refugia for the west coast rockfish: A workshop. NOAA Technical Memorandum NMFS-SWFSC-255. 159 p.
- Greene, H.G. M.M. Yoklavich, R.M. Starr, V.M. O'Connell, **W.W. Wakefield**, D.E. Sullivan, J.E. McCrea, and G.M. Cailliet. 1999. A classification scheme for deep seafloor habitats. *Oceanologica Acta* 22:663-678. [https://doi.org/10.1016/S0399-1784\(00\)88957-4](https://doi.org/10.1016/S0399-1784(00)88957-4)
- Cailliet, G.M., A.H. Andrews, **W.W. Wakefield**, G. Moreno, and K.L. Rhodes. 1999. A comparison of the fish fauna from beam trawl samples, camera sled photographs and submersible observations in benthic deep-sea habitats off central California. *Oceanologica Acta* 22:579-592. [https://doi.org/10.1016/S0399-1784\(00\)88949-5](https://doi.org/10.1016/S0399-1784(00)88949-5)
- McRea Jr, J.E., H.G. Greene, V.M. O'Connell, and **W.W. Wakefield**. 1999. Mapping marine habitats with high resolution sidescan sonar. *Oceanologica Acta* 22(6):679-686.
- Weinberg, J.R., P.J. Rago, **W.W. Wakefield** and C. Keith. 2002. Estimation of tow distance and spatial heterogeneity using data from inclinometer sensors: an example using a clam survey dredge. *Fisheries Research* 55:49-61. [https://doi.org/10.1016/S0165-7836\(01\)00292-2](https://doi.org/10.1016/S0165-7836(01)00292-2)
- Yoklavich, M.M., C.B. Grimes, and **W.W. Wakefield**. 2003. Using laser line scan imaging technology to assess deepwater habitats in the Monterey Bay National Marine Sanctuary. *Marine Technology Society Journal* 37:18-26. <https://doi.org/10.1109/OCEANS.2003.178028>
- Bosley, K.L., W. Lavelle, R.D. Brodeur, **W.W. Wakefield**, R.L. Emmett, E.T. Baker, K.M. Rehmke. 2004. Feeding relationships among pelagic and benthic communities in relation to the hydrodynamics of Astoria Submarine Canyon, Oregon, USA. *Journal of Marine Systems* 50:21-37. <https://doi.org/10.1016/j.jmarsys.2003.06.006>
- Lauth, R.R., J. Ianelli, **W.W. Wakefield**. 2004. Estimating the size selectivity and catching efficiency of a survey bottom trawl for thornyheads, *Sebastolobus* spp., using a towed video camera sled. *Fisheries Research* 70:27-37. <https://doi.org/10.1016/j.fishres.2004.06.010>
- Lauth, R.R., **W.W. Wakefield**, and K. Smith. 2004. Estimating the density of thornyheads, *Sebastolobus* spp., using a towed video camera sled. *Fisheries Research* 70:39-48. <https://doi.org/10.1016/j.fishres.2004.06.009>
- Wakefield, W.W.**, C.E. Whitmire, J.E.R. Clemons, B.N. Tissot. 2005. Fish habitat studies: Combining high-resolution geological and biological data, pp 119-138. In P. W. Barnes and J. P. Thomas, editors. *Benthic habitats and the effects of fishing*. American Fisheries Society, Symposium 41, Bethesda, Maryland.
- Grimes, C.B., M. Yoklavich, **W. Wakefield**, and H.G. Greene. 2005. Using lasers to investigate deepwater habitats in the Monterey Bay National Marine Sanctuary off central California. p 204. In P.W. Barnes and J. P. Thomas, editors. *Benthic habitats and the effects of fishing*. American Fisheries Society, Symposium 41, Bethesda, Maryland.
- Romsos, C.G., C. Goldfinger, R. Robison, R.L. Milstein, J.D. Chaytor and **W.W. Wakefield**. 2007. Development of a regional seafloor surficial geologic habitat map for the continental margins of Oregon and Washington, USA. In B.J. Todd and H.G. Greene, eds., *Mapping the Seafloor for Habitat Characterization*. Geological Association of Canada, Special Paper 47, p. 219-243.
- Amend, M.R., M.M. Yoklavich, Y. Rzhhanov, C.B Grimes, and **W.W. Wakefield**. 2007. Mosaics of benthic habitats using laser line scan technology: it's in the details. In B.J. Todd and H.G. Greene, eds., *Mapping the Seafloor for Habitat Characterization*. Geological Association of Canada, Special Paper 47, 61-69.

- Whitmire, C.E., R.W. Embley, **W.W. Wakefield**, S.G. Merle, and B.N. Tissot. 2007. Characterizing benthic habitats at Heceta Bank, Oregon. In B.J. Todd and H.G. Greene, eds., Mapping the Seafloor for Habitat Characterization. Geological Association of Canada, Special Paper 47, 111-126.
- Copps, S., M.M. Yoklavich, G. Parkes, **W.W. Wakefield**, A. Bailey, H.G. Greene, C. Goldfinger, and R.W. Burn. 2007. Applying Habitat Data to Fishery Management on the US West Coast. In B.J. Todd and H.G. Greene, eds., Mapping the Seafloor for Habitat Characterization. Geological Association of Canada, Special Paper 47, 451-462.
- Greene, H. G., V.M. O'Connell, **W.W. Wakefield**, and C. Brylinsky. 2007. The offshore Edgecumbe Lava Field, southeastern Alaska: Geologic and habitat characterization of a commercial fishing ground. In B.J. Todd and H. G. Greene, eds., Mapping the Seafloor for Habitat Characterization. Geological Association of Canada, Special Paper 47, 277-296.
- Stoner, A.W., C.H. Ryer, S.J. Parker, P.J. Auster, and **W.W. Wakefield**. 2008. Evaluating the role of fish behavior in surveys conducted with underwater vehicles. *Canadian Journal of Fisheries and Aquatic Sciences* 65:1230-1243. <https://doi.org/10.1139/F08-032>
- Tissot, B.N., **W.W. Wakefield**, M.A. Hixon, and J.E.R. Clemons. 2008. Twenty years of fish-habitat studies on Heceta Bank, Oregon, pp 203-217. In J.R. Reynolds and H.G. Greene (eds), *Marine Habitat Mapping Technology for Alaska*, Alaska Sea Grant College Program, University of Alaska Fairbanks. <https://doi:10.4027/mhmta.2008>.
- Juan Jordá, M.J., J.A. Barth, M.E. Clarke and **W.W. Wakefield**. 2009. Groundfish species associations with distinct oceanographic habitats off the Pacific Northwest Coast. *Fisheries Oceanography* 18:1-19. <https://doi.org/10.1111/j.1365-2419.2008.00489.x>
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- Hart, T.D., J.E.R. Clemons, **W.W. Wakefield**, and S.S. Heppell. 2010. Day and night abundance, distribution, and activity patterns of demersal fishes on Heceta Bank, Oregon. *Fishery Bulletin* 108(4):466-477.
- Yoklavich, M., K. Blackhart, S.K. Brown, C. Greene, T. Minello, Tom Noji, M. Parke, F. Parrish, K. Smith, R. Stone, and **W.W. Wakefield**. 2010. Marine fisheries habitat assessment improvement plan. Report of the National Marine Fisheries Service Habitat Assessment Improvement Plan Team. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/SPO-108, 115 p. <https://repository.library.noaa.gov/view/noaa/3724>
- Hannah, R.W. S.A. Jones, M.J.M. Lomeli, and **W.W. Wakefield**. 2012. Trawl net modifications to reduce the bycatch of eulachon (*Thaleichthys pacificus*) in the ocean shrimp (*Pandalus jordani*) fishery. *Fisheries Research* 110:277-282. <https://doi.org/10.1016/j.fishres.2011.04.016>
- Getsiv-Clemons, J.E.R., **W.W. Wakefield**, C.E. Whitmire, and I.J. Stewart. 2012. Identifying potential habitats from multibeam echosounder imagery to estimate abundance of groundfish: a case study at Heceta Bank, Oregon, USA. In: P.T. Harris and E.K. Baker (Eds.), *Seafloor Geomorphology as Benthic Habitat: GeoHab Atlas of Seafloor Geomorphic Features and Benthic Habitats*, Elsevier, Amsterdam, 569-586.
- Lomeli, M.J.M., and **W.W. Wakefield**. 2012. Efforts to reduce Chinook salmon (*Oncorhynchus tshawytscha*) and rockfish (*Sebastes* spp.) bycatch in the U.S. west coast Pacific hake

- (*Merluccius productus*) fishery using an open escape window bycatch reduction device. Fisheries Research 119-120:128-132. <https://doi.org/10.1016/j.fishres.2011.11.003>
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- Lomeli, M.J.M., and **W.W. Wakefield**. 2013. A flexible sorting grid to reduce Pacific halibut (*Hippoglossus stenolepis*) bycatch in the U.S. west coast groundfish bottom trawl fishery. Fisheries Research 143:102-108. <https://doi.org/10.1016/j.fishres.2013.01.017>
- Bryan, D.R., K.L. Bosley, A.C. Hicks, M.A. Haltuch, and **W.W. Wakefield**. 2014. Quantitative video analysis of flatfish herding behavior and impact on effective area swept of a survey trawl. Fisheries Research 154:120–126. <https://doi.org/10.1016/j.fishres.2014.02.007>
- Keller, A. A., **W.W. Wakefield**, C. Whitmire, B.H. Horness, M.A. Bellman, and K.L. Bosley. 2014. Distribution of demersal fishes along the U.S. west coast (Canada to Mexico) in relation to spatial fishing closures (2003-2011). Marine Ecology Progress Series 501:169–190. <https://doi.org/10.3354/meps10674>
- Stinton, A., L. Ciannelli, D.C. Reese, and **W.W. Wakefield**. 2014. Using in situ video analysis to assess juvenile flatfish behavior along the Oregon central coast. CalCOFI Reports 55:158-168.
- Blackhart (editor), K. 2014. Northwest Regional Habitat Assessment Working Group Members: Barnas, K., R. Brodeur, R. Emmett, C. Greene, P. Lawson, M. McClure, J. Stadler, J. Thorson, and **W. Wakefield** (Chair, Northwest Regional Habitat Assessment Working Group). 2014. Habitat assessment prioritization for West Coast stocks. Report of the Northwest and Southwest Regional Habitat Assessment Prioritization Working Groups. Internal report, NMFS White Paper. Office of Science and Technology, NMFS, NOAA. Silver Spring, MD. 199 p. Corrected edition, December 2014.
- Yoklavich, M. and **W.W. Wakefield**. 2015. Pacific Coast Region. In: NMFS. Our living oceans: habitat. Status of the habitat of U.S. living marine resources. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-75, 327 p. doi: 10.7755/TMSPO.75
- Keller, A.A., L. Ciannelli, **W.W. Wakefield**, V. Simon, J.A. Barth, and S.D. Pierce. 2015. Occurrence of demersal fishes in relation to near-bottom oxygen levels within the California Current large marine ecosystem. Fisheries Oceanography 24:162-176. <https://doi.org/10.1111/fog.12100>
- Lomeli, M.J.M., and **W.W. Wakefield**. 2015. Testing of Pacific halibut bycatch reduction devices in two US West Coast bottom trawl fisheries. In: G.H. Kruse, H.C. An, J. DiCosimo, C.A. Eischens, G.S. Gislason, D.N. McBride, C.S. Rose, and C.E. Siddon (eds.), Fisheries Bycatch: Global Issues and Creative Solutions. Alaska Sea Grant, University of Alaska Fairbanks. <http://doi.org/10.4027/fbgics.2015.01>
- Boehm, A.B., M.Z. Jacobson, M.J. O'Donnell, M. Sutula, **W.W. Wakefield**, S.B. Weisberg, and E. Whiteman. 2015. Ocean acidification science needs for natural resource managers of the North American west coast. Oceanography 28:170-181. <https://doi.org/10.5670/oceanog.2015.40>
- Lomeli, M.J.M., and **W.W. Wakefield**. 2016. Evaluation of a selective flatfish sorting grid bycatch reduction device in a U.S. west coast bottom trawl fishery. Fisheries Research 183:294-303. <https://doi.org/10.1016/j.fishres.2016.06.011>

- Bizzarro, J.J., M.M. Yoklavich, and **W.W. Wakefield**. 2017. Diet composition and foraging ecology of U.S. Pacific Coast groundfishes with applications for fisheries management. *Environmental Biology of Fishes* 100:375–393. <https://doi.org/10.1007/s10641-016-0529-2>
- Keller, A.A., L. Ciannelli, **W.W. Wakefield**, V. Simon, J.A. Barth, and S.D. Pierce. 2017. Species-specific responses of demersal fishes to near-bottom oxygen levels within the California Current large marine ecosystem. *Marine Ecology Progress Series* 568:151-173. <https://doi.org/10.3354/meps12066>
- Lomeli, M.J.M., O.S. Hamel, **W.W. Wakefield**, and D.L. Erickson. 2017. Improving catch utilization in the U.S. West Coast groundfish bottom trawl fishery: An evaluation of T90-mesh and diamond-mesh cod ends, *Marine and Coastal Fisheries*, 9:149-160. <https://doi.org/10.1080/19425120.2016.1274697>
- Klinger, T., E.A. Chornesky, E.A. Whiteman, F. Chan, J.L. Largier, and **W.W. Wakefield**. 2017. Using integrated, ecosystem-level management to address intensifying ocean acidification and hypoxia in the California Current Large Marine Ecosystem. *Elementa: Science of the Anthropocene*, 5:16. <https://doi.org/10.1525/elementa.198>
- Lomeli, M.J.M., and **W.W. Wakefield**, and B. Herrmann. 2017. Testing of two selective flatfish sorting-grid bycatch reduction devices in the U.S. West Coast groundfish bottom trawl fishery, *Marine and Coastal Fisheries*, 9:597-611. <https://doi.org/10.1080/19425120.2017.1388888>
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- Sobocinski, K.L., L. Ciannelli, **W.W. Wakefield**, M.E. Yergey, A. Johnson-Colegrove. 2018. Distribution and abundance of juvenile demersal fishes in nearshore habitats of the Oregon coast in relation to summer hypoxia and other environmental variables. *Estuarine, Coastal and Shelf Science* 205:75-90. <https://doi.org/10.1016/j.ecss.2018.03.002>
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- Lomeli, M.J., S.D. Groth, M.T. Blume, B. Herrmann, and **W.W. Wakefield**. 2018. Effects on the bycatch of eulachon and juvenile groundfishes by altering the level of artificial illumination along an ocean shrimp trawl fishing line. *ICES Journal of Marine Science* 75: 2224-2234. <https://doi.org/10.1093/icesjms/fsy105>
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- Stimpert, A.K., B.C. Madrigal, **W.W. Wakefield**, and M.M. Yoklavich. 2019. Acoustic characterization of underwater mobile survey vehicles and their contribution to the

- soundscape habitat of Pacific rockfishes. *Journal of the Acoustical Society of America Express Letters*, 146, EL45. <https://doi.org/10.1121/1.5109914>
- Lomeli, M.J.M., S.D. Groth, M.T.O. Blume, B. Herrmann, and **W.W. Wakefield**. 2020. The efficacy of illumination to reduce bycatch of eulachon and groundfishes before trawl capture in the eastern North Pacific Ocean shrimp fishery. *Canadian Journal of Fisheries and Aquatic Sciences*, 77: 44–54. <https://dx.doi.org/10.1139/cjfas-2018-0497>
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- Lomeli, M.J.M., **W.W. Wakefield**, B. Herrmann, C. Dykstra, A. Simeon, D. Rudy, J.V. Planas. 2021. Use of artificial illumination to reduce Pacific halibut bycatch in a U.S. West Coast groundfish bottom trawl. In: G.H. Kruse, C. Rooper, R. Novikov, and J. Planas (eds.), *Integrating biological research, fisheries science and management of Pacific halibut (*Hippoglossus stenolepis*) across the North Pacific*. *Fisheries Research*, 223, 105737. <https://doi.org/10.1016/j.fishres.2020.105737>
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- Howard, R.A., L. Ciannelli, **W.W. Wakefield**, and M.R. Fewings. 2021. The effects of climate, oceanography, and habitat on the distribution and abundance of northern California Current continental shelf groundfishes. *Fisheries Oceanography*, 30, 707-725. <https://doi.org/10.1111/fog.12553>
- Campbell, M.D., A. Huddleston, D. Somerton, M.E. Clarke, **W. Wakefield**, S. Murawski, C. Taylor, H. Singh, Y. Girdhar, and M. Yoklavich. 2021. Assessment of attraction and avoidance behaviors of fish in response to the proximity of transiting underwater vehicles. *Fishery Bulletin* 119:216-230. <https://doi.org/10.7755/FB.119.4.2>
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- Lockhart, K., L. Ciannelli, **W.W. Wakefield**. 2023. Comparative analysis of sampling methodologies for assessing abundance and distribution of young-of-the-year groundfishes in nearshore soft-sediment habitats. *Fisheries Research* 264, 106734. <https://doi.org/10.1016/j.fishres.2023.106734>
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OTHER PUBLICATIONS / REPORTS / ETC. (1994 TO PRESENT):

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- Wakefield, W.** 2020. Assessing benthic habitat impacts and recovery processes in association with major changes in spatial management of fisheries off the Oregon coast. Oregon Sea Grant 2020 State of Coast Conference, Virtual. November 5 and 6.
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Graduate Student Committees

Oregon State University: M Abele, M Agapito, R Carlile, G Christie, E. Conser, R Easton, T Hart, K Haven, Dylan Heppell, R Howard, MJ Juan Jorda, A Lanier, M Mann, C Romsos, A Sjostrom, N Strom, C Vestfals, C Whitmire; Other Universities: L Ferry, S Hagan, D Haroski, B Holladay, G Levai, S O'Brien, J Pirtle, T Shank