

Dr. Richard M. Starr

Research Faculty Moss Landing Marine Laboratories
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Education: B.A. with distinction, 1973, University of Virginia, Environmental Sciences, M.S. 1976, Oregon State University, Physical Geography, D.Sc., 2002, Universidad Autónoma de Baja California Sur, Coastal Zone Management

Employment: 2003- present: Research Faculty Moss Landing Marine Labs; 2009-2016: Director, University of California Sea Grant Extension Program 1993-2009: Marine Advisor, University of California Sea Grant Extension Program; 1987-1993: Oregon Department of Fish and Wildlife Marine Habitat and Shellfish Program Manager; 1981-1987: Principal Investigator Oregon Department of Fish and Wildlife: Marine Habitat Project, Scallop Ecology Project, Pink Shrimp Ecology Project, Squid Ecology Project, Squid Hydroacoustic Assessment Project; 1980-1981: Research Associate Oregon State University, Gray Whale Tagging Project. 1978-1980: Researcher Oregon Department of Fish and Wildlife, Estuarine and Wetland Inventory Project; 1976-1978: Estuarine and Wetland Ecologist, Lincoln County Planning Department.

Teaching Positions: Adjunct Professor, Moss Landing Marine Labs 2003- present; Adjunct Professor, California State University Monterey Bay, 1995-2003, Instructor Linn-Benton Community College 1976, 1977, 1978, 1986; Instructor Sitka Center for Art and Ecology 1982; Teaching Assistant Oregon State University 1975; Teaching Assistant Marine Advisory Program 1980.

Professional Affiliations: American Fisheries Society; Western Society of Naturalists, AAAS

Delegations, Committees, Task Forces:

Science Advisor to California Marine Protected Area Monitoring Initiative: Present
Reserve Advisory Committee, Elkhorn Slough National Estuarine Research Reserve: 1993-present, Committee Chair: 1994-95
Research Activities Panel, Monterey Bay National Marine Sanctuary: 1993-present. Committee Vice-Chair: 1995-2001
Science Advisory Committee to California Marine Life Protection Act Initiative 2005-2006
Alternate, CDFG Marine Life Protection Act Working Group 2002-2004
California Department of Fish and Game Squid Fishery Advisory Committee: 1998-1999
President, Board of Directors S.E.A. Lab Monterey Bay: 1996-2005
Scientific Advisory Panel for Marine Reserves, Pacific Ocean Cons. Network: 1998-1999
Alternate, Sanctuary Advisory Committee, Monterey Bay Natl. Marine Sanctuary: 1998-2001
Board of Directors, Santa Cruz Museum Association: 1993-95
Sanctuary Education Panel, Monterey Bay National Marine Sanctuary: 1993-1997
Research Advisory Committee, Elkhorn Slough National Estuarine Research Reserve: 1993 - 2004. Committee Chair: 1996-1998
Planning Faculty Search Committee, CSU Monterey Bay: 1994-1995.
Pacific Northwest State-Federal Placer Minerals Task Force: Oregon Delegate 1989-91
American Delegation of Shellfish Researchers to China: 1987
Scientific Advisory Committee, Oregon Ocean Resources Task Force: 1986-90

Research Cruises:

SCUBA research: 30 years field research Alaska, Oregon, California, Belize, Mexico, Spain
Submersible research: 18 research cruises; 168 dives: Mermaid II (2), Delta (158), DeepSee (8)
Submersible Pilot: 6 Deepworker Dives
Chief Scientist for 10 fishery research cruises from 1981-1987
Chief Scientist for biological studies on 20-scientist, multi-disciplinary study of geological and biological resources associated with Oregon nearshore mineral deposits: 1990
Chief Scientist on submersible cruises to study rockfishes: 1991-93, 1997-98, 2004, 2007, 2008
Lead ichthyologist on National Geographic Submersible Expedition off Costa Rica 2009
PI on telemetry research project to study lingcod movements: 1999-2002
PI on telemetry research project to study prickly shark movements: 1999, 2000
PI on telemetry research project to study movements of fishes in Carmel Bay 2004-2010
PI on tag-recapture research project to study fishes off Duxbury Reef, CA 2005-2008
PI on video surveys of deep-water fishes associated with fishery closures 2012-present
Co-PI to collect baseline information on new MPAs 2007-present
Co-PI on multi-disciplinary team using a submersible to study a methane vent: 1990
Co-PI on project to study movements of Nassau groupers in Belize: 2001-2007
Co-PI on project to compare SCUBA and fishery surveys of nearshore ecosystems: 2003-2006
Co-PI on project to study Dusky groupers in Medes Islands Marine Reserve, Spain: 2003, 2006
Co-PI on project to study fish movements in Medes Islands Marine Reserve, Spain: 2007-2011
Co-PI on project to evaluate changes in fish populations after 15 years of fishery closures in CA

SELECTED PUBLICATIONS

Starr, R.M., E. Ballesteros, E. Sala, J.M. Llenas. 2018. Spawning behavior of the tiger grouper (*Mycteroperca tigris*) in a Caribbean atoll. *Environmental Biology of Fishes* doi.org/10.1007/s10641-018-0813-4

Denney, C., Fields, R., Gleason, M., Starr, R. 2017. Development of New Methods for Quantifying Fish Density Using Underwater Stereo-video Tools. *J. Vis. Exp.* (129), e56635, doi:10.3791/56635.

Aspillaga, E., F. Bartumeus, R.M. Starr, À. López-Sanz, C. Linares, D. Díaz, J. Garrabou, M. Zabala, B. Hereu. 2017. Thermal stratification drives movement of a coastal apex predator. *Nature Scientific Reports*. 7:526. DOI:10.1038/s41598-017-00576-z.

Starr, R.M., M.G. Gleason, C.I. Marks, D. Kline, S. Rienecke, C. Denney, A. Tagini, J.C. Field. 2016. Targeting Abundant Fish Stocks While Avoiding Overfished Species: Video and fishing surveys to inform management after long-term fishery closures. *PLOS One*. 11(12): e0168645. doi:10.1371/journal.pone.0168645.

Greenley, A., K. Green, and R.M. Starr. 2016. Seasonal and ontogenetic movements of Lingcod (*Ophiodon elongatus*) in central California, with implications for marine protected area management. *California Cooperative Oceanic Fisheries Investigations*. Vol. 57, 2016.

Aspillaga, E., F. Bartumeus, C. Linares, R.M. Starr, À. López-Sanz, D. Díaz, M. Zabala, B. Hereu. 2016. Ordinary and extraordinary movement behaviour of small resident fish within

a Mediterranean Marine Protected Area. PLoS ONE 11(7): e0159813.
doi:10.1371/journal.pone.0159813

- Bjorkstedt, E., J. Field, M. Love, L. Rogers-Bennett, R. Starr. 2016. Marine fisheries. pp. 779-816 in: H. Mooney and E. Zavaleta (eds.) Ecosystems of California. University of California Press.
- Marks, C.I., R.T. Fields, J.C. Field, R.R. Miller, S.G. Beyer, S.M. Sogard, D. Wilson-Vandenberg, D. Howard, R.M. Starr. 2015. Changes in size composition and relative abundance of fishes in central California after a decade of spatial fishing closures. California Cooperative Oceanic Fisheries Investigations. Vol. 56, 2015
- Loury, E.K., S.M. Bros, D.A. Ebert, R.M. Starr, and G.M. Cailliet. 2015. Trophic ecology of the gopher rockfish *Sebastes carnatus* inside and outside of Central California marine protected areas. Marine Ecology Progress Series. doi: 10.3354/meps11420, Vol. 536: 229–241.
- Barnes, C.L., R.M. Starr, and P.N. Reilly. 2015. Growth, mortality, and reproductive seasonality of California halibut (*Paralichthys Californicus*): a biogeographic approach. California Cooperative Oceanic Fisheries Investigations. Vol. 56, 2015.
- Starr, R.M., D.E. Wendt, C.L. Barnes, C.I. Marks, D. Malone, G. Waltz, K.T. Schmidt, J. Chiu, A.L. Launer, N.C. Hall, N. Yochum. 2015. Variation in responses of fishes across multiple reserves within a network of marine protected areas in temperate waters. PLoS One. 10.1371/journal.pone.0118502
- Green, K.M., A.P. Greenley, and R.M. Starr. 2014. Movements of Blue Rockfish (*Sebastes mystinus*) off Central California with Comparisons to Similar Species. PLoS One. Vol. 9, Issue 6. e98976.
- Starr, R.M., K. Green and E. Sala. 2012. Deepwater fish assemblages at Coco Island National Park and Las Gemelas Seamounts, Costa Rica. Revista Biología Tropical. 60 (Suppl. 3): 347-362. Epub 2012 Dec 01.
- Starr, R.M., J. Cortés, C.L. Barnes, K. Green and O. Breedy. 2012. Characterization of deepwater invertebrates at Isla del Coco National Park and Las Gemelas Seamounts, Costa Rica. Revista Biología Tropical. 60 (Suppl. 3): 303-319. Epub 2012 Dec 01.
- Yochum, N., R.M. Starr, and D.E. Wendt. 2011. Utilizing Fishermen Knowledge and Expertise: Keys to Success for Collaborative Fisheries Research. Fisheries. Vol. 36 (12): 593-605.
- Green, K.M. and R.M. Starr. 2011. Movements of small adult black rockfish: Implications for the design of MPAs. Marine Ecology Progress Series. Vol. 14: 219–230.
- Carlisle, A.B. and R.M. Starr. 2010. The influence of tides on the rates of movement of female leopard sharks (*Triakis semifasciata*) in Elkhorn Slough, California. Environmental Biology of Fishes. 89:31–45.

- Starr, R.M., M. Carr, D. Malone, A. Greenley, and S. McMillan. 2010. Complementary Sampling Methods to Inform Ecosystem-Based Management of Nearshore Fisheries. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science*. 2:159–179.
- Dawson, C.L. and R.M. Starr. 2009. Movements of subadult prickly sharks, *Echinorhinus cookei*, in the Monterey Canyon. *Marine Ecology Progress Series*. Vol. 386: 253–262.
- Wendt, D.E. and R.M. Starr. 2009. Collaborative Research: An Effective Way to Collect Data for Stock Assessments and Evaluate Marine Protected Areas in California. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science*. 1:315–324.
- Carlisle, A.B. and R.M. Starr. 2009. Habitat use, residency, and seasonal distribution of female leopard sharks (*Triakis semifasciata*) in Elkhorn Slough, California. *Marine Ecology Progress Series*. Vol. 380: 213–228.
- Starr, R.M. and M.M. Yoklavich. 2008. Monitoring MPAs in Deep Water off Central California: 2007 IMPACT Submersible Baseline Survey. California Sea Grant College Program Publication T-067. 24 pp.
- Starr, R.M., E. Sala, E. Ballesteros, and M. Zabala. 2007. Spatial dynamics of the Nassau grouper (*Epinephelus striatus*) in a Caribbean atoll. *Marine Ecology Progress Series*. Vol. 343:239-249.
- Starr, R.M., V. O'Connell, and S. Ralston. 2004. Movements of lingcod (*Ophiodon elongatus*) in southeast Alaska: potential for increased conservation and yield from marine reserves. *Canadian Journal of Fisheries and Aquatic Sciences*, Vol. 61, No. 7. pp. 1083 -1094.
- Starr, R.M., J.M. Cope, and L.A. Kerr. 2002. Trends in fisheries and fishery resources associated with the Monterey Bay National Marine Sanctuary from 1981–2001. California Sea Grant College System Publication T- 046. 156 pp.
- Sala, E., E. Ballesteros, R.M. Starr. 2001. Rapid decline of Nassau grouper spawning aggregations in Belize: Fishery management and conservation needs. *Journal American Fisheries Society*. Vol. 26. No. 10. pp. 23-30.
- Greene, H.G., M.M. Yoklavich, V.M. O'Connell, R.M. Starr, W.W. Wakefield, C.K. Brylinsky, J.J. Bizzarro, and G.M. Cailliet. 2000. Mapping and Classification of Deep Seafloor Habitats. ICES paper CM 2000/T:08. 11 pp.
- Starr, R.M., J.N. Heine, and K.A. Johnson. 2000. *In situ* techniques for tagging and tracking rockfishes. *North American Journal of Fisheries Management*, Vol. 20:597-609.
- Greene, H.G., M.M. Yoklavich, R.M. Starr, V.M. O'Connell, W.W. Wakefield, D.E. Sullivan, J.E. McRea, and G.M. Cailliet. 1999. A seafloor classification scheme for deep water marine benthic and fisheries habitats. *Oceanologica Acta*, Vol. 22 (6): 663-678.
- Stanbury, K.B. and R.M. Starr. 1999. Applications of geographic information systems (GIS) to habitat assessment and marine resource management. *Oceanologica Acta*, Vol. 22 (6): 699-703.

Starr, R.M. 1998. Design principles for rockfish reserves on the U.S. West Coast. pp. 50-63 in: Yoklavich, M. (ed.) Marine harvest refugia for west coast rockfish: a workshop. NOAA, NMFS Tech. Memo. NOAA-TM-NMFS-SWFSC-255. 159 pp.

Starr, R.M. and K.A. Johnson. 1998. Goal oriented marine reserves: A zoogeographic approach. pp. 262-272 in: O.T. Magoon, H. Converse, B. Baird, and M. Miller-Henson, eds. California and the world ocean '97. Taking a look at California's ocean resources: an agenda for the future. American Society of Civil Engineers, Reston, Virginia.

Starr, R.M., D.S. Fox, M.A. Hixon, B.N. Tissot, G.E. Johnson, and W.H. Barss. 1996. Comparison of submersible-survey and hydroacoustic-survey estimates of fish density on a rocky bank. Fishery Bulletin. 94:113-123.

Pearcy, W.G., D.L. Stein, M.A. Hixon, E.K. Pikitch, W.H. Barss, and R.M. Starr. 1989. Submersible observations of deep-reef fishes of Heceta Bank, Oregon. Fishery Bulletin. 87:955-965.