

Ian M. Miller, PhD

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Blog: <http://coastnerd.blogspot.com>
YouTube: <https://www.youtube.com/user/CoastNerd>

PROFESSIONAL PROFILE

I am a Coastal Hazards Specialist for the Washington Sea Grant program, where I use applied research, outreach and science synthesis to build coastal community resilience to natural coastal hazards. I am also adjunct faculty at Peninsula College in Port Angeles, WA. My research interests include sea level, coastal geomorphology, sediment transport, biophysical interactions in the coastal environment and the application of these disciplines to management problems related to hazards and climate change. I also am interested in undergraduate education methods and pedagogy in the ocean and earth sciences.

ACADEMIC QUALIFICATIONS

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| 2011 | PhD. Department of Ocean Sciences, UC Santa Cruz. Dissertation titled, "Mixed beach morphodynamics and shoreline evolution on the dammed Elwha River Delta, Washington State, USA". Advisors: Drs. Gary Griggs, Jon Warrick, Noah Finnegan, and Chris Edwards. |
| 1996 | Bachelors of Science, cum laude. Degree in Environmental Science with an emphasis in Marine Ecology. Huxley College of Environmental Studies, Western Washington University. Advisor: Dr. Bert Webber. |
| 1995 | Quarter-in-residence. Oregon Institute of Marine Biology, University of Oregon. |
| 1994 | National Science Foundation Research Experience for Undergraduates Fellow. University of Hawaii at Manoa. Advisors: Drs. Ed Parnell and Craig Smith. |

PUBLICATIONS

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| 2019 | Miller, I.M. , Yang, Z., VanArendonk, N., Grossman, E., Mauger, G. S., Morgan, H., 2019. Extreme Coastal Water Level in Washington State: Guidelines to Support Sea Level Rise Planning. A collaboration of Washington Sea Grant, University of Washington Climate Impacts Group, Oregon State University, University of |
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Washington, and U.S. Geological Survey. Prepared for the Washington Coastal Resilience Project.

Yang, Z., Wang, T., Castrucci, L., and **I.M. Miller**. Submitted. Modeling assessment of storm surge in the Salish Sea. *Estuarine, Coastal and Shelf Science*.

Glover, H.E., Ogston, A.S., **Miller, I.M.**, Eidam, E.F., Rubin, S.P. and H.D. Berry. 2019. Impacts of suspended sediment on nearshore benthic light availability following dam removal in a small mountainous river: In-situ observations and statistical modeling. *Estuaries and Coasts*. DOI:10.1007/s12237-019-00625-y

Warrick, J.A., Stevens, A.W., **Miller, I.M.**, Harrison, S.R., Ritchie, A.C. and G. Gelfenbaum. 2019. World's largest dam removal reverses coastal erosion. *Scientific Reports*.

Zurbuchen, J., Simms, A.R., Warrick, J.A., and **I.M. Miller**. Accepted. Characterizing the stratigraphic signature of mouth-bar welding on wave-dominated deltas: Insights from ground-penetrating radar on the Elwha River Delta, Washington. *Sedimentology*

2018 Ritchie, A.C., Warrick, J.A., East, A.E., Magirl, C.S., Stevens, A.W., Bountry, J.A., Randle, T.J., Curran, C.A., Hildale, R.C., Duda, J.J., Gelfenbaum, G.R., **Miller, I.M.**, Pess, G.R., Foley, M.M., McCoy, R., and A.S. Ogston. 2018. Morphodynamic evolution following sediment release from the world's largest dam removal. *Scientific Reports* 8: e13279. DOI:10.1038/s41598-018-30817-8

Miller, I.M. 2018. A coastal scientist's perspective on dam removal. *International Water Power and Dam Construction*. December 2018: pp. 42-44

Miller, I.M., Morgan, H., Mauger, G., Newton, T., Weldon, R., Schmidt, D., Welch, M., Grossman, E. 2018. Projected Sea Level Rise for Washington State – A 2018 Assessment. A collaboration of Washington Sea Grant, University of Washington Climate Impacts Group, Oregon State University, University of Washington, and US Geological Survey. Prepared for the Washington Coastal Resilience Project. Available at <http://www.wacoastalnetwork.com/wcrp-documents.html>

Norheim, R.A., Mauger, G.S., and **I.M. Miller**, 2018. Guidelines for Mapping Sea Level Rise. Report prepared for the EPA National Estuary Program (NEP). Climate Impacts Group, University of Washington, Seattle.

Raymond, C., Conway-Cranos, L., Morgan, H., Faghin, N., Spilsbury Pucci, D., Krienitz, J., **Miller, I.M.**, Grossman, E. and Mauger, G., 2018. Sea level rise considerations for nearshore restoration projects in Puget Sound. A report prepared for the Washington Coastal Resilience Project.

- 2017 Rubin, S.P., **Miller, I.M.**, Foley, M.M., Berry, H.D., Duda, J.J, Hudson, B., Elder, N.E., Beirne, M.M., Warrick, J.A., McHenry, M.L, Stevens, A.W. and E.F. Eidam. 2017. Increased sediment load during a large-scale dam removal changes nearshore communities. PLoS ONE 12(12): e0187742.
<https://doi.org/10.1371/journal.pone.0187742>
- Garrison-Laney, C., and **I.M. Miller**. 2017. Tsunamis in the Salish Sea: Recurrence, Sources, Hazards. Field Trip Guidebook for Geological Society of America 2017 Meeting. Seattle, Washington; 22-25 October 2017
- Miller, I.M.** and Mastriani, E. 2017. Prioritizing flood risk reduction and ecosystem services on the Dungeness River delta: A parcel-scale analysis. Prepared for the Jamestown S’Klallam Tribe. Available at http://www.jamestowntribe.org/programs/nrs/nrs_Dungeness_River_Delta.htm
- Miller, I.M.**, Gray, H. and M.L. McHenry. 2017. Ediz Hook Phase 3 Beach Restoration and Nourishment: Intertidal Morphology Monitoring Summary. Report to the North Olympic Peninsula Lead Entity. Available via Researchgate.
- 2016 Stevens, A.W., Gelfenbaum, G., Warrick, J.A., **Miller, I.M.**, and Weiner, H.M., 2016, Bathymetry, topography, and sediment grain-size data from the Elwha River delta, Washington, September 2014 to July 2016: U.S. Geological Survey data releases, available at <https://www.sciencebase.gov/catalog/item/586c36a2e4b0f5ce109fa88c>
- Miller, I.M.**, Petersen, S., Fougerat, M., Pucci, D., Clark, L., and B. Wood. 2016. Sea Level Rise and Coastal Flood Risk Assessment: Island County, Washington. Published by Adaptation International.
- 2015 Petersen, S., Bell, J., **Miller, I.M.**, Jayne, C., Dean, K., Fougerat, M., 2015. *Climate Change Preparedness Plan for the North Olympic Peninsula*. A Project of the North Olympic Peninsula Resource Conservation & Development Council and the Washington Department of Commerce, funded by the Environmental Protection Agency. Available: www.noprkd.org
- Miller, I.M.**, Ogston, A.S., and Dolan, J. 2015. Sedimentology of intertidal deposits after dam removal on a coastal river. The Proceedings of the Coastal Sediment 2015.
- Warrick, J.A., Gelfenbaum, G., Stevens, A.W., **Miller, I.M.**, Kaminsky, G.M., and Foley, M.M. 2015. Coastal change from a massive sediment input: Dam Removal, Elwha River, Washington, USA. The Proceedings of the Coastal Sediments 2015.

- Gelfenbaum, G., Stevens, A.W., **Miller, I.M.**, Warrick, J.A., Ogston, A.S., and Eidam, E. 2015. Large-scale dam removal on the Elwha River, Washington, USA: Coastal geomorphic change. *Geomorphology* (246) 649-668.
- 2014 Petersen, A., Hals, H., Rot, B., Bell, J., **Miller, I.M.**, Parks, J., and Stults, M. 2014. Climate change and the Jamestown S’Klallam Tribe: A customized approach to climate vulnerability and adaptation planning. *Michigan Journal of Sustainability*, Vol. 2. DOI: <http://dx.doi.org/10.3998/mjs.12333712.0002.003>
- 2013 **Miller, I.M.**, Shishido, C., Antrim, L, and Bowlby, E.C. (eds.) 2013. Climate Change and the Olympic Coast National Marine Sanctuary: Interpreting Potential Futures. Marine Sanctuaries Conservation Series ONMS-13-01. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 232 pp.
- Miller, I.M.** and Petersen, S. 2013. Sea Level Rise and Coastal Flooding. In: Jamestown S’Klallam Tribe, 2013. Climate Change Vulnerability Assessment and Adaptation Plan. Petersen, S., Bell, J. (eds.) A collaboration of the Jamestown S’Klallam Tribe and Adaptation International.
- 2012 **Miller, I.M.**, and Brennan, J. 2012. Debris Accumulation Scenarios in Washington State from the March 2011 Tōhoku Tsunami. Washington Sea Grant Technical Report WSG-TR-12-02.
- Miller, I.M.**, and Warrick, J.A. 2012. Measuring Sediment Transport and Bed Disturbance with tracers on a Mixed Beach. *Marine Geology* 299-302, 1-7.
- Warrick, J.A., Rosenberger, K., Lam, A., Ferreira, J., **Miller, I.M.**, Rippy, M., Svejksky, J., and Mustain, N., 2012, Observations of coastal sediment dynamics of the Tijuana Estuary Fine Sediment Fate and Transport Demonstration Project, Imperial Beach, California, U.S. Geological Survey Open-File Report 2012–1083, 29 p and data files.
- 2011 **Miller, I.M.** 2011. Mixed beach morphodynamics and shoreline evolution on the dammed Elwha River delta, Washington State, USA. Doctoral dissertation, UC Santa Cruz, Santa Cruz, CA.
- Miller, I.M.**, Warrick, J.A., Morgan, C., 2011. Observations of coarse sediment movements on the mixed beach of the Elwha Delta, Washington. *Marine Geology* 282, 201-214.
- Rubin, S.P., **Miller, I.M.**, Elder, N., Reisenbichler, R.R. and Duda, J.J. 2011. Nearshore Biological Communities Prior to Removal of the Elwha River Dams. In: Duda, J.J., Warrick, J.A., and Magirl, C.S., eds., Coastal habitats of the Elwha River, Washington— Biological and physical patterns and processes prior to dam

removal: U.S. Geological Survey Scientific Investigations Report 2011–5120, pp. 131-174.

Warrick, J.A., Stevens, A.W., **Miller, I.M.** and Gelfenbaum, G. 2011. Coastal Processes of the Elwha River Delta. In: Duda, J.J., Warrick, J.A., and Magirl, C.S., eds., Coastal habitats of the Elwha River, Washington— Biological and physical patterns and processes prior to dam removal: U.S. Geological Survey Scientific Investigations Report 2011–5120, pp. 112-130.

Warrick, J.A., Draut, A.E., McHenry, M.L., **Miller, I.M.**, Magirl, C.S., Beirne, M.M., Stevens, A.W. and Logan, J.B. 2011. Geomorphology of the Elwha River and its Delta. In: Duda, J.J., Warrick, J.A., and Magirl, C.S., eds., Coastal habitats of the Elwha River, Washington— Biological and physical patterns and processes prior to dam removal: U.S. Geological Survey Scientific Investigations Report 2011–5120, pp. 47-73.

Finlayson, D.P., **Miller, I.M.**, and Warrick, J.A., 2011, Bathymetry and acoustic backscatter—Elwha River Delta, Washington: U.S. Geological Survey Open-File Report 2011–1226.

Other

- Miller, I.M., 2013. Tsunamis in the Strait of Juan de Fuca. TsuInfo Alert: The Newsletter of the Washington State Tsunami Hazard Mitigation Program. Volume 15, Number 6.
- Miller, I.M., 2013. Data Collection and Processing: Elwha Estuary Survey, February 2013. A report for the Lower Elwha Klallam Tribe.
- Miller, I.M., and Dawson, E., 2013. Community College Students Experience Oceanographic Data Collection and Analysis. HOB0 e-news: Application Stories.
- Miller, I.M., 2004. “Elwha Restoration Project Makes Slow Progress” In: *Making Waves: Newsletter of the Surfrider Foundation*. June 2004.

TEACHING/EDUCATION

2018	Instructor , OCEA 101, Introduction to Oceanography. Peninsula College, Port Angeles, WA Co-Instructor , Ocean 492, Marine Sedimentary Processes: Elwha River Dam Removal Impacts Research Apprenticeship. University of Washington, Friday Harbor, WA. Lead Instructor: Dr. Andrea Ogston
2017	Instructor , OCEA 101, Introduction to Oceanography. Peninsula College, Port Angeles, WA

- 2016 **Co-Instructor**, Ocean 492, Marine Sedimentary Processes: Elwha River Dam Removal Impacts Research Apprenticeship. University of Washington, Friday Harbor, WA. Lead Instructor: Dr. Andrea Ogston
- 2015 **Instructor**, OCEA 101, Introduction to Oceanography. Peninsula College, Port Angeles, WA
- Mentor**, ENVIR 511, Environmental Management – Keystone Project. University of Washington, Seattle, WA.
- 2014 **Co-Instructor**, Ocean 492, Marine Sedimentary Processes: Elwha River Dam Removal Impacts Research Apprenticeship. University of Washington, Friday Harbor, WA. Lead Instructor: Dr. Andrea Ogston
- Mentor**, ENVIR 511, Environmental Management – Keystone Project. University of Washington, Seattle, WA.
- Instructor**, OCEA 101, Introduction to Oceanography. Peninsula College, Port Angeles, WA
- 2013 **Instructor**, OCEA 101, Introduction to Oceanography. Peninsula College, Port Angeles, WA
- 2012 **Instructor**, OCEA 101, Introduction to Oceanography. Peninsula College, Port Angeles, WA
- 2010 **Teaching Assistant**, Oceans 1, Introduction to Ocean Science. University of California Santa Cruz. Instructor: Dr. Chris Edwards
- 2009 **Teaching Assistant**, EART 105, Coastal Geology. University of California Santa Cruz. Instructor: Dr. Gary Griggs
- 2008 **Teaching Assistant**, Oceans 1, Introduction to Ocean Science. University of California Santa Cruz. Instructor: Dr. Chris Edwards
- 2001-2003 **Education Director**, Olympic Park Institute. Lake Crescent, WA. Field-based environmental science instruction for K-12 students.
- 1997-2001 **Field Instructor**, Olympic Park Institute. Lake Crescent, WA. Field-based environmental science instruction for K-12 students.
- 2001 **Program Director**, Sound Experience, Port Townsend, WA. Marine science education for K-8 students based off of the schooner *Adventuress*.

- 1999 **Marine Science Specialist**, Feiro Marine Life Center, Port Angeles, WA.
Marine Science Education for the public.
- 1998 **Field Educator**, Salish Sea Expeditions, Bainbridge Island, WA. Marine
science education for K-12 student based off of the yawl *Carlyn*.

STUDENT/INTERN MENTORSHIP

- 2019 Hannah Drummond (MS Candidate), Western Washington University
- 2018 Nathan Ganzhorn (undergraduate), Peninsula College
- 2017 Emily Scott (volunteer intern)
Laura Priddis (undergraduate), Huxley College on the Peninsulas
- 2015 Jacob Melly (undergraduate), Huxley College on the Peninsulas
Dana Wu (post-graduate), Citizen Action Training School Program
Matthew Teich, (graduate), University of Washington
- 2014 Kasten Turrey (high school), North Olympic Peninsula Skills Center
Jennifer Hartke (undergraduate), Huxley College of the Environment
Ammon Dodson (undergraduate), Peninsula College
Austin Law (undergraduate), University of Washington
Katherine Eacrett, (undergraduate), Peninsula College
- 2013 Eliza Dawson (undergraduate), Peninsula College
Sara Rahmani (undergraduate), Everett Community College
Peter Steelquist (undergraduate), Evergreen State College
Kevin Simans (undergraduate), University of Washington
Leah Miyamoto (undergraduate), University of Washington
Rachel Williams (undergraduate), University of Washington
- 2012 Kelly Sullivan (undergraduate), University of Washington
Kassandra Grimm (undergraduate), Huxley College on the Peninsulas
Caitlin Shashido (graduate), University of Washington
Chris Clark (undergraduate), Huxley College on the Peninsulas

OTHER PROFESSIONAL EXPERIENCE

- 2003-2006 **Washington Field Coordinator**, Surfrider Foundation
- 2000-2001 **Research Cruise Technician**, Olympic Coast National Marine Sanctuary

2000	Salmon Redd Surveys , North Olympic Salmon Coalition
2000	Bering Sea Groundfish Observer , Alaskan Observers, Inc.
1998	Program Director , Saltash Mountain Summer Camp, Farm and Wilderness
1993	Shellfish Stock Assessment Technician , Washington State Department of Fisheries

GRANTS, AWARDS and HONORS

2019	<ul style="list-style-type: none"> • Outstanding Community Impact Award, University of Washington College of the Environment
2018	<ul style="list-style-type: none"> • Exceptional Faculty Grant Award, Peninsula College • US Geological Survey Unit Award for Excellence of Service for the Elwha River Science Team
2017	<ul style="list-style-type: none"> • Co-Investigator, “Competing water use in the face of climate change: Integrated analysis to support water resource planning for extreme events”. Grant from National Oceanic and Atmospheric Administration Sectoral Applications Research Program (NOAA SARP)
2016	<ul style="list-style-type: none"> • Co-Investigator, “Improving risk communication and leveraging existing programs in Washington State to build capacity and enhance resilience in coastal communities”. Grant from National Oceanic and Atmospheric Administration
2015	<ul style="list-style-type: none"> • Co-Investigator, “Progress towards a new sedimentary and ecological equilibrium: Habitat modification due to the Elwha Dam removal”. With University of Washington Department of Oceanography. Funded by Washington Sea Grant
2014	<ul style="list-style-type: none"> • Co-Investigator, “Planning for Climate Change on the North Olympic Peninsula”. With the North Olympic Peninsula Resource Conservation and Development Council and Adaptation International. Contract #14-63401-004
2013	<ul style="list-style-type: none"> • Co-Investigator, “Engaging Communities in a Coastal Resilience Network in Washington State”. Grant from National Oceanic and Atmospheric Administration

- Co-Investigator, “Student Opportunities in Field Research: Engaging West End Natural Resources Students in Shoreline Monitoring”. Grant from the North Olympic Marine Resources Committee
- 2012
- Co-Investigator, “Historical Analysis of Marine Debris from the Washington Coast”. Grant from the North Olympic Marine Resources Committee
 - Collaborator, “Climate Change Vulnerability Assessment and Adaptation Plan for the Jamestown S’Klallam Tribe”. Sub-contract from Adaptation International.
- 2011
- Co-Investigator, “Olympic Coast National Marine Sanctuary Climate Change Vulnerability Assessment”. Contract from the Office of National Marine Sanctuaries, National Oceanic and Atmospheric Administration.
- 2009
- Student Poster Award, Puget Sound/Georgia Basin Ecosystem Conference
 - Friends of Long Marine Lab Student Research Grant
 - Center for the Dynamics and Evolution of the Land-Sea Interface Graduate Student Research Grant
- 2008
- Thomas Pratte Memorial Scholarship
 - Meyers Oceanography and Marine Biology Trust Grant
- 2005
- Principal Investigator, Puget Sound Action Team Public Involvement and Education (PIE) Grant
- 2004
- National Oceanic and Atmospheric Administration Environmental Hero Award

COMMITTEE AND SPECIAL SERVICE

CURRENT

- Member, Strait Ecosystem Recovery Network Technical Review Committee 2015-present
- Member, North Olympic Peninsula Lead Entity Technical Review Group 2014-present
- Ex-officio Member, North Olympic Coast Marine Resources Committee 2013-present
- Development Committee Member, Feiro Marine Life Center 2012-present
- Member, Strait Ecosystem Recovery Network (a Local Integrating Organization of the Puget Sound Partnership) 2012-present

PAST

- Member, Feeder Bluff Technical Advisory Committee, WA 2012-2013

- Department of Ecology
- Member, Three Crabs Restoration Project Technical Review Committee 2013
 - Alternate, Washington Coast Marine Advisory Committee Science Seat 2011-2013
 - Member, Scientific Advisory Team for West Coast Governors Alliance West Coast Hazards Map 2011-2012
 - Member, University of Washington College of the Environment Science Communication Task Force 2012-2013
 - Member, Organizing Committee. Elwha Science Symposium 2011, 2012
 - Member, Clallam County Marine Resources Committee 2003-2006
 - Member, North Olympic Land Trust Board 2003-2006
 - Member, Washington State BEACH Program Guidance Committee 2003-2006
 - Alternate, Washington State Oil Spill Advisory Committee 2003-2006
 - Member, Washington State Oil Spill Contingency Plan Rule-Making Committee 2003-2006
 - Member, Northwest Straits Commission Education Sub-committee 2006
 - Contributor, Puget Sound Partnership Environmental Caucus 2006

JOURNALS REVIEWED

- Water
- Oceanography
- Earth Surface Process and Landforms
- Coastal Management Journal
- Journal of Marine Science and Engineering
- Geologica Acta
- Marine Geophysical Research
- Arctic
- Taylor and Francis (textbook)

CURRENT MEMBERSHIPS

American Geophysical Union. Member Since 1 January 2008

Northwest Science Association.

American Association of Underwater Sciences. Member Since 7 April 2008

Coastal Education and Research Foundation. Member Since 1 January 2009

Divers Alert Network. Member since 22 January 2008

The Oceanography Society

SPECIALTY COURSES

- **Ocean Observing Initiative Data Lab Workshop.** 40-hour course, 18-23 August 2019. Course by Rutgers University. Bellingham, WA

- **Coastal Inundation Mapping.** 16-hour course, 29-30 January 2018. Course by NOAA's Office for Coastal Management. Lacey, Washington
- **Planning for Meaningful Evaluation.** 16-hour course, 4-5 February 2015. Course by NOAA's Office for Coastal Management. Seattle, WA
- **Coastal Flood Risk Reduction.** 8-hour course, 21 February 2013. Course by the National Disaster Preparedness Training Center. Port Angeles, WA
- **Preparing Students in Two-Year Colleges for Geosciences Degrees and Careers.** 24-hour workshop, July 18-21, 2012. Course by SAGE2YC (<http://serc.carleton.edu/sage2yc/index.html>). Tacoma, WA.
- **Coastal Community Resilience.** 8-hour course, June 2011. Course by the National Disaster Preparedness Training Center. Port Angeles, WA
- **NOAA Ocean Satellite Data.** 20 hour course, 23-25 March 2011. Instructed by David Foley, Elliot Hazen and Cara Wilson. OSU, College of Oceanic and Atmospheric Sciences, Corvallis, OR.
- **SWAN Wave Modelling.** 8 hour course, 2/9/2010 and 2/16/2010. Instructed by Dr. Andre van de Westhuysen, Deltares. USGS Pacific Marine Science Center, Santa Cruz, CA
- **Vertical Geodetic and Tidal Datums.** 24 hour course, April 2009. Instructed by staff of the National Geodetic Survey and NOAA. USGS Pacific Marine Science Center, Santa Cruz, CA.
- **Modelling with Delft3D.** 40 hour course. Instructed by Dr. Edwin Elias, USGS. USGS Pacific Marine Science Center, Santa Cruz, CA
- **UC Santa Cruz Scientific Diving.** Completed June 2008. Instructed by Steve Clabuesch. UC Santa Cruz, Santa Cruz, CA.
- **GIS For the Management Practitioner.** 8 hour course, May 2006. Instructed by Dr. Dwight Barry, Peninsula College. Peninsula College, Port Angeles, WA
- **Coastal Management in Washington State.** 16 hour course, April 2006. Coastal Training Service
- **Cold Water Survival.** Federal Fisheries Observer Training. Anchorage, AK, February 2000

CERTIFICATIONS

First Aid

- WMI Wilderness First Responder (Lapsed)
- DAN Oxygen First Aid for SCUBA Diving Injuries
- AHSI Basic Life Support

SCUBA

- University of Washington Scientific Diver (2011-Current)
- University of California Scientific Diver (2008-2011)
- NAUI NITROX Diver
- NAUI Master SCUBA Diver

- NAUI Advanced SCUBA
- NAUI Specialty Diver (Teaching Assistant)
- NAUI Rescue Diver
- University of Hawaii Scientific Diver, 100fsw Depth Qualified (1996)
- NASDS Open Water Diver (certified 1994)

Boat Operations

- American Watercraft Association Responder
- US Department of the Interior Marine Operators Certification Course (re-certified May 2018)
- CA Department of Boating and Waterways
- U.S. Navy Sailing Qualification (“Class A”)