

Wendel W. Raymond

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EDUCATION

- University of Alaska Fairbanks**, Juneau, AK 2020
PhD – Fisheries
Dissertation: Sea otters in southeast Alaska: subsistence harvest and ecological effects in seagrass communities
- Oregon State University**, Corvallis, OR 2012
B.S. – Biology, marine concentration, chemistry minor
Cum Laude, Research Fellow

EXPERIENCE

- University of Washington – Friday Harbor Laboratories**, Friday Harbor, WA
Nearshore Ecology Research Scientist Feb. 2021 - Present
- Data visualization and synthesis lead for floating canopy kelp indicator as part Puget Sound Vital Signs program. Collaboration with WA Department of Natural Resources.
 - Project lead for qualitative and quantitative assessment of heatwave induced mass mortality of intertidal shellfish. Collaboration with Jamestown S’Klallam, Swinomish and other WA tribes, state and federal agencies, and multiple university partners.
 - Project lead for research and monitoring of watershed – estuary connectivity, including research on biology, ecology, and habitat and how these relate to changing ecological regimes. Collaboration with San Juan County and local non-profits.
 - Field and data management assistant for long term monitoring of nearshore/intertidal communities. Collaboration with WA Department of Natural Resources.
- University of Alaska Fairbanks**, Juneau, AK
Graduate Research Assistant Aug. 2019 – May 2020
Trophic linkages in eelgrass ecosystems. Project design and management, hiring, mentoring, and supervising undergraduate research assistants, permitting, field and lab work, small boat operations, coordination with project partners, data management and analysis.
- NSF Graduate Research Fellow* 2015 – 2020
Investigating sea otter – eelgrass relationships with a focus on field surveys and community biomarker analysis. See details above.
- Alaska Sea Grant Graduate Student Research Fellow* Aug. 2014 – Aug. 2016
Patterns and effects of subsistence sea otter harvest in southeast Alaska. Procurement, analysis, and management of USFWS subsistence sea otter harvest database, coordination with academic and USFWS collaborators.
- University of Washington – Friday Harbor Laboratories**, Friday Harbor, WA
Research Technician Jun. 2012 – Aug. 2014
Impacts of shoreline armoring on Puget Sound beaches. Intertidal fieldwork, processing invertebrate samples, coordination of interdisciplinary team, data management and analysis of biological field and lab data.
- Research Technician* Jun. 2012 – Sept. 2013
Spatial subsidy and trophic connectivity between nearshore macrophyte production and subtidal food webs. Subtidal fieldwork, designing and maintaining lab and field experiments, data management and analysis.

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NSF Research Experience for Undergraduates Jun. 2011 – Aug. 2011
Marcoalg feeding preferences of sea urchins. Assisting with multiple graduate student research projects, subtidal field work, maintaining lab and field experiments, data management and analysis.

Oregon State University, Corvallis, OR
Research Technician Oct. 2009 – Jun. 2012
Ecological effects of invasive lionfish. Data quality control, subtidal fish community surveys, care of aquarium animals. Independent research project on competition for shelter between invasive lionfish and native Nassau grouper.

PUBLICATIONS (†undergraduate mentee)

In prep

Borup M†, Eckert GL, **Raymond WW**. *In prep*. Sea otters reduce benthic mesopredator predation in Southeast Alaska seagrass communities. *Marine Ecology Progress Series*.
Stephens TA, Shields M†, Borup M†, **Raymond WW**, Eckert GL. *In prep*. Bioturbation by sea otters reduces the extent of intertidal seagrass in Southeast Alaska. *Proceedings of the National Academy of Sciences*.

Published

Raymond WW, Barber J, Dethier M, Harley C, King T, Paul B, Speck C, Tobin E, Raymond A, McDonald PS. 2022. Assessment of an unprecedented heatwave on Salish Sea shellfish. *Ecology*. doi: 10.1002/ecy.3798.

Raymond WW, Schram J, Eckert GL, Galloway AWE. 2021. Effect of sea otters on the trophic structure of Southeast Alaska eelgrass beds. *Marine Ecology Progress Series*. doi.org/10.3354/meps13819.

Raymond WW, Hughes B, Stephens TA, Mattson C†, Bolwerk A, Tinker MT, Eckert GL. 2021. Testing the generality of apex predator mediated trophic cascades in seagrass meadows. *Oikos*. doi.org/10.1111/oik.07681.

Whalen M, ... et al. **Raymond WW**,... Duffy JE. 2020. Climate drives the geography of marine consumption by changing predator communities. *PNAS*. <https://doi.org/10.1073/pnas.2005255117>.

Prentice C, Poppe KL, Lutz M, Murray M, Stephens TA, Spooner A, Hessing-Lewis M, Sanders-Smith R, Rybczyk JM, Apple J, Short F, Gaeckle J, Helms A, Mattson C†, **Raymond WW**, Klinger T. 2020. A synthesis of blue carbon stocks, sources and accumulation rates in eelgrass (*Zostera marina*) meadows in the Northeast Pacific. *Global Biogeochemical Cycles*. doi.org/10.1029/2019GB006345.

Raymond WW, Tinker MT, Benter B, Kissling M, Gill V, Eckert GL. (2019). Location specific factors influence patterns and effects of subsistence sea otter harvest in southeast Alaska. *Ecosphere*. doi.org/10.1002/ecs2.2874.

Stephens TA, Hughes BB, Kroeker KJ, Hessing-Lewis M, Monteith Z, Morris M, **Raymond WW**. (2019). Between a rock and a soft place: surfgrass also colonizes sediments without attachment to rock. *Ecology*. doi 10.1002/ecy.2791.

Tinker MT, Gill V, Esslinger GG, Bodkin J, Monk M, Mangel M, Monson DH, **Raymond WW**, Kissling M. (2019). Trends and carrying capacity of sea otters in Southeast Alaska. *J Wildlife Manag.* 83:1-17.

Dethier MN, **Raymond WW**, McBride AN, Toft JD, Cordell JR, Ogston AS, Heerhartz SM, Berry HD (2016) Multiscale impacts of armoring on Salish Sea shorelines: Evidence for cumulative and threshold effects. *Estuar Coast Shelf Sci* 175:106–117.

Raymond WW, Albins MA, Pusack TJ (2015) Competitive interactions for shelter between invasive Pacific red lionfish and native Nassau grouper. *Environ Biol Fishes* 98:57–65.

Raymond WW, Lowe A, Galloway AWE (2014) Degradation state of algal diets affects fatty acid composition but not size of red urchin gonads. *Mar Ecol Prog Ser* 509:213–225.

Dethier MN, Brown AS†, Burgess S†, Eisenlord ME, Galloway AWE, Kimber J†, Lowe AT, O’Neil CM†, **Raymond WW**, Sosik EA., Duggins DO (2014) Degrading detritus: Changes in food quality of aging kelp tissue varies with species. *J Exp Mar Bio Ecol* 460:72–79.

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REPORTS

Raymond WW, Berry H, Claar D, Naar N, Woodard T, Shull S, Mumford T, Dowty P, Christiaen B, Ferrier L, Ledbetter J, Dethier MN, Spaulding E. In prep. Floating kelp canopies: a new Vital Sign indicator in Puget Sound, Indicator Options. Washington Department of Natural Resources
Berry H, Naar N, Woodard T, Shull S, Mumford T, **WW. Raymond**, Dowty P, Christiaen B, Ferrier L, Ledbetter J, Dethier MN, Spaulding E. 2022. Floating kelp canopies: a new Vital Sign indicator in Puget Sound, Initial Scoping. Washington Department of Natural Resources.

MEDIA

New study: 2021 heat wave created 'perfect storm' for shellfish die-off. UW News

TEACHING

University of Washington – Friday Harbor Laboratories, Friday Harbor, WA

Lecturer

Fall 2021

FHL 472: Biodiversity and Monitoring for Estuarine Ecosystems (15 crd). Research apprenticeship focused on estuarine ecosystems. Students complete an independent research project with support from instructors.

University of Alaska Fairbanks, Juneau, AK

Adjunct Instructor

May 2019

FISH 414 Field Methods in Marine Ecology and Fisheries (3 crd). Two-week intensive course based in Juneau, AK. Instruction on theory and practice of field and laboratory techniques, data management and analysis applicable to marine ecology and fisheries.

Graduate Teaching Assistant

May 2015

FISH 414 Field Methods in Marine Ecology and Fisheries (3 crd).

Oregon State University, Corvallis, OR

Undergraduate Teaching Assistant

Sept. 2011 – Mar. 2012

BI 211 & BI 212 (4 crd each). Assisted graduate teaching assistant with laboratory section.

Prepared lab materials, assisted with instruction and student evaluation.

GRANTS AND AWARDS

- 2021 Washington Sea Grant – Program Development. Assessing impacts of June 2021 heatwave on intertidal shellfish of the Salish Sea. PI: McDonald PS, Senior Personnel and lead author: Raymond WW. \$9,779.71
- 2018 Goetz Instrument Support Program – Awarded use of ASD HandHeld 2: Hand-held VNIR spectroradiometer and \$500 towards publication/travel.
- 2018 University of Alaska Fairbanks – College of Fisheries and Ocean Sciences Outstanding Graduate Student of the Year.
- 2017 North Pacific Research Board – Graduate Student Research Award. Sea otters and ecosystem function of eelgrass habitats in Southeast Alaska. \$25,000
- 2017 American Fisheries Society – Steven Berkley Marine Conservation Fellowship. A model for marine conservation: community structure and trophic mechanisms in Southeast Alaska eelgrass ecosystems. \$10,000
- 2017 Lerner-Gray Fund for Marine Research. Sea otters, seagrass, and fish communities in Southeast Alaska. \$1,000.
- 2017 Earthwatch Institute. The role of sea otters in seagrass in Southeast Alaska. PI Eckert GL, Co-PI Raymond WW. \$87,300
- 2015 NSF Graduate Research Fellowship Program. \$46,000/year for 3 years
- 2011 NSF Research Experience for Undergraduates (REU) summer internship. \$2000
- 2010 Oregon State University Undergraduate Research, Innovation, Scholarship & Creativity (URISC).

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\$2100.

SELECTED PRESENTATIONS(†undergraduate mentee)

Raymond WW, Barber J, Dethier M, Hayford H, Harley C, King T, Paul B, Speck C, Tobin E, Raymond A, McDonald PS. Assessment of an unprecedented heatwave on Salish Sea shellfish. Presentation and panel discussion at Salish Sea Ecosystem Conference. Apr. 2022.

Raymond WW, Berry H, Claar D, Naar N, Woodard T, Shull S, Mumford T, Dowty P, Christiaen B, Ferrier L, Ledbetter J, Dethier MN, Spaulding E. Development of a floating kelp canopy area indicator for the Puget Sound Partnership's Vital Signs. Presentation at the Salish Sea Ecosystem Conference. Apr. 2022.

Raymond WW, Barber J, Dethier M, Hayford H, Harley C, King T, Paul B, Speck C, Tobin E, Raymond A, McDonald PS. Assessment of an unprecedented heatwave on Salish Sea shellfish. Presentation at the Western Society of Naturalists Conference. Nov. 2021.

Borup M†, Eckert GL, **Raymond WW**. Sea otters reduce benthic mesopredator predation in southeast Alaska seagrass communities. Presentation at Western Society of Naturalists Nov. 2020.

Raymond WW, Schram J, Galloway AWE, Eckert GL. Trophic mysteries of the shallows: Unraveling eelgrass ecosystems in Southeast Alaska. Presentation at Coastal and Estuarine Research Federation. Mobile, AL. Nov. 2019.

Raymond WW, Tinker MT, Kissling M, Benter B, Gill VA, Eckert GL. Patterns and effects of sea otter harvest in Southeast Alaska. Presentation at Southeast Environmental Conference. Craig, AK. Sept. 2019.

Raymond WW. ShoreZone as a tool for nearshore ecology in Southeast Alaska. Presentation at ShoreZone Partners Meeting, Portland, OR. July 2019.

Raymond WW, Bell TW. Using reflectance to estimate condition of giant kelp (*Macrosystis pyrifera*) and its relationship to environmental variability. Poster at International Seaweed Symposium, Jeju South Korea. April 2019.

Raymond WW, Hughes B, Stephens TA, Mattson C†, Bolwerk A, Eckert GL. Ecological relationships between recovering sea otters and eelgrass communities in southeast Alaska. Presentation at Alaska Marine Science Symposium. Anchorage, AK. Jan. 2019.

COMMUNITY ENGAGEMENT AND INVITED TALKS (*distance delivery)

Oct. 2021 Guest speaker: Assessment of an unprecedented heatwave on Salish Sea Intertidal Shellfish. Washington Shellfish Co-Managers Technical Meeting.

Oct. 2021 Guest speaker: Assessment of an unprecedented heatwave on Salish Sea Intertidal Shellfish. Puget Sound Ecosystem Monitoring Program.

Nov. 2020 Guest lecture*: Trophic cascades in southeast Alaska. UAF FISH 676 Aquatic Food Web Ecology. Instructor: Dr. Anne Beaudreau

May 2020 Guest speaker*: Sea otters and southeast Alaska. Second grade class at Trinity Basin Preparatory, Fort Worth TX.

Oct. 2018 Guest lecture: Competition and resource partitioning. UAF FISH 676 Aquatic Food Web Ecology. Instructor: Dr. Anne Beaudreau.

Sep. 2018 Guest lecture: Introduction to git and GitHub. UAF FISH 692 Data Wrangling Case Studies. Instructor: Dr. Franz Mueter.

Aug. 2018 Engagement: Eelgrass walk. Hydaburg Culture Camp. Hydaburg, AK.

Apr. 2018 Engagement: Field gear. University of Alaska Fisheries Days at Juneau UAF Lena Point.

Apr. 2015 Guest speaker: Identifying ecological roles of sea otters in Southeast Alaska. Ted Steven Marine Research Institute, Juneau Alaska. Hiram College Alaska Fisheries Course. Juneau, AK.

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- Apr. 2014 Guest lecture: Data management and analysis. Jefferson Community School. Port Townsend, WA.
- Aug. 2013 Seminar speaker: Effects of fresh and aged kelp diets on red urchins. Friday Harbor Laboratories, Friday Harbor, WA.

SERVICE

Leadership:

2019: Member CFOS Student Advisory Committee
2018 – 2019: Member UAF Graduate Academic and Advisory Committee
2017 – 2019: President of American Fisheries Society Juneau student subunit
2014 – 2017: Graduate student health insurance coordinator, American Fisheries Society Juneau student subunit

Journal reviews:

Deep Sea Research II, Marine Biology Progress Series, Marine Biology, Marine Biology Research, Journal of Experimental Marine Biology and Ecology, Estuaries and Coasts, Hydrobiologia.

Grant reviews:

North Pacific Research Board

Community:

2020 – Present: Ski Patroller – Hurricane Ridge Ski Area

SKILLS AND CERTIFICATIONS

Software:

R/RStudio, git/GitHub, ESRI ArcGIS Pro, ESRI Drone2Map, MS Office suite, Adobe Premier Pro, Adobe Illustrator

Certifications:

Outdoor Emergency Care (Ski Patrol), AMSEA small boat operator, Washington State Boater Card, PADI Divemaster, DAN O2 provider, CPR/AED.