

Aaron W. E. Galloway, Ph.D.

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RESEARCH INTERESTS

I am a marine and freshwater ecologist, working primarily on trophic interactions at the base of the food web (algae and primary consumers) using fatty acids and stable isotope biomarkers. My interests also include natural resource management, wildlife ecology, and citizen science. My experiential teaching approach has been honed in K-12, undergraduate, and graduate classes, with an emphasis on mentoring.

APPOINTMENTS (courses taught in bold)

- Instructor (Scheduled), **Ecology Between & Below Pacific Tides (with Scientific Diving option)**.* University of Washington (UW), Friday Harbor Labs (FHL). Session B Summer 2015.
- Postdoctoral Research Associate, Faculty, Washington State University, School of the Environment, Pullman WA, USA.* Supervisor: Stephanie Hampton. September 2014 – Present.
- Visiting Postdoctoral Researcher, Stockholm University, Department of Ecology, Environment and Plant Sciences, Sweden (Home Institution: UC Davis).* Supervisor: Monika Winder. November 2013-14.
- Postdoctoral Researcher, University of Eastern Finland, Department of Biology, Joensuu, Finland.* Supervisor: Paula Kankaala. June 2013-November 2013.
- Graduate Research Assistant, University of Washington (UW), School of Aquatic and Fishery Sciences, Friday Harbor Labs (FHL).* Supervisors: Sebens, Duggins, Dethier, Brett, Simenstad. 2007-2013.
- Graduate Teaching Fellow, National Science Foundation (NSF) Ocean and Coastal Interdisciplinary Science (OACIS) GK-12 Program Fellowship, **Biology**.* Spring Street Int. School, FHL, UW. 2012-13.
- Graduate Teaching Assistant, **Marine Invertebrate Zoology**.* FHL, UW. Spring 2012.
- Graduate Teaching Fellow, **Oceanography, Physics, Chemistry**.* NSF OACIS GK-12, Friday Harbor High School, FHL, UW. 2010-11.
- Graduate Teaching Assistant, **Marine Botany**.* FHL, UW. Summer 2011.

EDUCATION

<i>University of Washington</i>	Aquatic and Fishery Sciences (Ecology)	Ph.D. 2013
<i>Central Washington University</i>	Resource Management (Wildlife Biology)	M.S. 2004
<i>The Evergreen State College</i>	Environmental Science and Policy	B.A. 1999

AWARDS, SCHOLARSHIPS, CERTIFICATIONS

- School of Aquatic and Fishery Sciences **Faculty Merit Award** for dissertation – 2013
- University of Eastern Finland postdoctoral research grant – 2013
- NSF Ocean and Coastal Interdiscip. Science GK-12 Program Fellowship – 2012
- Richard and Megumi Strathmann Fellowship, Alan and Marian Kohn Fellowship; (FHL) – 2012
- International Phycological Society Paul C. Silva Student Grant – 2011
- Pacific Northwest Shell Club Scholarship Award – 2011
- PADI Foundation Research Funding Award – 2011
- UW SAFS Graduate Research Funds Scholarship Award – 2011

- American Acad. Underwater Scientists Kathy Johnston Award – 2010
- NSF Ocean and Coastal Interdiscip. Science GK-12 Program Fellowship – 2010
- National Shellfisheries Association Castagna Research Grant – 2009
- American Acad. Underwater Scientists (AAUS) Lead Research Diver – since 2007
- Corps member of the quarter award, Washington Conservation Corps – 2001

PUBLICATIONS (including *in press*, ♦=student co-authors)

- Hampton, SE, MV Moore, T Ozersky, E Stanley, CM Polashenski, AWE Galloway. 2015. Heating up a cold subject: prospects for under-ice research in lakes. **Journal of Plankton Research** 37:277-284. doi:10.1093/plankt/fbv002
- Strandberg, U, S Taipale, M Hultunen♦, AWE Galloway, MT Brett, and P Kankaala. 2015. Inferring heterogeneous phytoplankton composition with a fatty acid mixing model. **Ecosphere** 6:art16. doi:10.1890/ES14-00382.1
- McDonald, PS, AWE Galloway, K McPeck♦, and GR VanBlaricom. 2015. Effects of geoduck (*Panopea generosa* Gould, 1850) aquaculture gear on resident and transient macrofauna communities of Puget Sound, Washington, USA. **Journal of Shellfish Research** 34:189-202. doi: 10.2983/035.034.0122
- McDonald, PS, TE Essington, JP Davis, AWE Galloway, BC Stevick♦, GC Jensen, GR VanBlaricom, and DA Armstrong. 2015. Distribution, abundance, and habitat associations of a large bivalve (*Panopea generosa*) in a eutrophic fjord estuary. **Journal of Shellfish Research** 34:137-145. doi: 10.2983/035.034.0117
- Galloway, AWE, S Taipale, M Hultunen♦, E Peltomaa, U Strandberg, MT Brett, and P Kankaala. 2014. Diet specific biomarkers show that high quality phytoplankton fuel herbivorous zooplankton in large boreal lakes. **Freshwater Biology** 59:1902-1915.
- Galloway, AWE, ME Eisenlord♦, MN Dethier, GW Holtgrieve, and MT Brett. 2014. Quantitative estimates of isopod resource utilization using a Bayesian fatty acid mixing model. **Marine Ecology Progress Series** 507:219-232.
- Raymond, WR♦, AT Lowe, and AWE Galloway. 2014. Degradation state of algal diets affects fatty acid composition but not size of red urchin gonads. **Marine Ecology Progress Series** 509:213-225.
- Dethier, MN, A Brown♦, S Burgess♦, ME Eisenlord♦, AWE Galloway, J Kimber♦, AT Lowe, CM O'Neil♦, WR Raymond♦, EA Sosik, and DO Duggins. 2014. Degrading detritus: changes in food quality of aging kelp tissue varies with species. **Journal of Experim. Marine Biology and Ecology** 460:72-79.
- Lowe, AT, AWE Galloway, JS Yeung♦, MN Dethier, and DO Duggins. 2014. Broad sampling and diverse biomarkers allow characterization of nearshore particulate organic matter. **Oikos** 123:1341-1354. doi:10.1111/oik.01392
- Lowe, AT, R Whippo♦, AWE Galloway, KH Britton-Simmons, and MN Dethier. 2014. Sedentary urchins influence benthic community composition below the macroalgal zone. **Marine Ecology**. doi: 10.1111/maec.12124
- Galloway, AWE, AT Lowe, EA Sosik, JS Yeung♦, and DO Duggins. 2013. Fatty acid and stable isotope biomarkers suggest microbe-induced differences in benthic food webs between depths. **Limnology and Oceanography** 58:1452-1462.
- Taipale, S, E Peltomaa, U Strandberg, AWE Galloway, A Ojala, and MT Brett. 2013. Fatty acid composition as biomarkers of freshwater microalgae: analysis of 37 strains of microalgae in 22 genera and in 7 classes. **Aquatic Microbial Ecology** 71:165-178.
- Dethier, MN, EA Sosik, AWE Galloway, DO Duggins, and CA Simenstad. 2013. Addressing assumptions: variation in stable isotopes and fatty acids in marine macrophytes can confound conclusions of food web studies. **Marine Ecology Progress Series** 478:1-14. (*Feature Article*)

- Galloway, AWE, KH Britton-Simmons, DO Duggins, PW Gabrielson, and MT Brett. 2012. Fatty acid signatures differentiate marine macrophytes at ordinal and family ranks. **Journal of Phycology** 48:956-965.
- Britton-Simmons, KH, AL Rhoades♦, RE Pacunski, AWE Galloway, AT Lowe, EA Sosik, et al. 2012. Habitat and bathymetry influence the landscape-scale distribution and abundance of drift macrophytes and associated invertebrates. **Limnology and Oceanography** 57:176-184.
- Galloway, AWE, RJ Hickey, and GM Koehler. 2011. A Survey of ungulates by students along rural school bus routes. **Society and Natural Resources** 24:201-204.
- Galloway, AWE, MM Tudor, and M Vander Haegen. 2006. The reliability of citizen science: a case study of Oregon white oak stand surveys. **Wildlife Society Bulletin** 34:1425-1429.
- Galloway, AWE. 2013. Trophic transfer of nearshore basal resources: interpreting fatty acid and stable isotope biomarkers. **PhD Dissertation**, UW.
- Galloway, AWE. 2004. The use of rural school bus routes and students for monitoring ungulate distribution in Kittitas County, Washington. **Master's Thesis**, CWU.

MANUSCRIPTS IN REVISION and REVIEW

- Galloway, AWE, MT Brett, GW Holtgrieve, EJ Ward, AP Ballantyne, CW Burns, MJ Kainz, DC Muller-Navarra, J Persson, JL Ravet, U Strandberg, S Taipale, and G Ahlgren. *in revision*. A fatty acid based algorithm for inferring diet in aquatic consumers. PLoS ONE.
- Galloway, AWE, M Winder. *in review*. Partitioning the relative importance of phylogeny and environmental conditions on phytoplankton fatty acids.
- Dalu, T, Galloway AWE, Richoux NB, Froneman PW. *in review*. Effect of substrate type on phyto-benthos essential fatty acid availability in an austral temperate river system.

SELECTED PRESENTATIONS (*indicates presenter) at scientific meetings

- The land-sea interface: a unique place for producing fish. *M Winder, J Carstensen, AWE Galloway, HH Jakobsen, J Cloern.
- Assoc. for the Sci. of Limnol. & Oceanogr. (ASLO) Annual Meeting, 2/2015, Grenada, Spain
- Food web consequences of seasonal and decadal changes in phytoplankton fatty acid composition. *AWE Galloway, SJ Taipale, M Hiltunen♦, U Strandberg, P Kankaala, MT Brett, M Winder.
- Joint Aquatic Sciences Meeting 5/2014, Portland, OR
- Quantitative estimates of resource utilization by an herbivorous isopod using a Bayesian fatty acid mixing model. *ME Eisenlord♦, MN Dethier, GW Holtgrieve, MT Brett, AWE Galloway.
- Joint Aquatic Sciences Meeting 5/2014, Portland, OR
- Fatty acids as chemotaxonomic markers for phytoplankton community composition. *U Strandberg, SJ Taipale, M Hiltunen♦, AWE Galloway, MT Brett, P Kankaala.
- Joint Aquatic Sciences Meeting 5/2014, Portland, OR
- Patterns and drivers of nearshore particulate organic matter composition. *AT Lowe, AWE Galloway, JS Yeung, MN Dethier, DO Duggins.
- Salish Sea Ecosystem Conference 4/2014, Seattle, WA
- Trophic mysteries of the deep: differences in invertebrate consumer biomarkers across depths. *AWE Galloway, AT Lowe, EA Sosik, DO Duggins.
- Western Society of Naturalists (WSN) Annual Meeting, 11/2012, Vancouver, WA
- A prototype algorithm to reverse-engineer zooplankton diets based on their fatty acid composition. *MT Brett, MJ Kainz, SJ Taipale, CW Burns, AWE Galloway, KA Martin.
- Assoc. for the Sci. of Limnol. & Oceanogr. Annual Meeting, 7/2012, Otsu, Japan

SELECTED POSTERS (*indicates presenter) at scientific meetings

Detecting zooplankton diet sources in large boreal lakes with stable carbon isotope ratios and fatty acid biomarkers. *P Kankaala, AWE Galloway, M Hiltunen, E Jelkanen, U Strandberg, S Taipale.

- Assoc. for the Sci. of Limnol. & Oceanogr. (ASLO) Annual Meeting, 2/2015, Grenada, Spain

Engaging the next generation of marine scientists: secondary education at Friday Harbor Laboratories.

*D Smith, TR Dwyer, J Roberts, J Visciglia, AWE Galloway.

- Benthic Ecology Meeting, 3/2013, Savannah, GA

Food choices and values for a benthic herbivore, *Idotea wosnesenskii*. *S Burgess♦, ME Eisenlord♦, AWE Galloway, MN Dethier. **Honorable Mention for Best Student Poster**

- Soc. Integrative & Comparative Biology (SICB) Annual Meeting, 1/2013, San Francisco, CA.

A comparison of red urchin (*Strongylocentrotus franciscanus*) laboratory algal feeding rates with in situ captured drift algae. *S Roberts♦, AWE Galloway, DO Duggins.

- SICB Annual Meeting, 1/2013, San Francisco, CA

Fatty acid signatures and growth in juvenile *Idotea wosnesenskii* respond to differing macroalgal diets.

*ME Eisenlord♦, AWE Galloway, MN Dethier.

- WSN Annual Meeting, 11/2012, Vancouver, WA

RECENT INVITED TALKS AND SEMINARS

“Tracking algal production through food webs: subsidies, food quality, and fatty acids as trophic markers”. 8-Dec, 9-Dec-2014. Invited seminars, Oregon Institute of Marine Biology (Coos Bay, OR) and Department of Biology (Eugene, OR), University of Oregon.

“Quantitative estimates of basal resource utilization by herbivorous consumers using fatty acids”. 13-Nov-2013. Invited seminar, Department of Biology, University of E. Finland, Joensuu, Finland.

“Quantitative partitioning of basal resource utilization by boreal lake *Daphnia* using a fatty acid based Bayesian mixing model”. 7-Nov-2013. Invited seminar, Department of Biological and Environmental Science, Jyväskylä University, Finland.

“Tracking trophic relationships with biomarkers”. 13-May-2013. Invited Seminar, UW School of Aquatic and Fishery Sciences, Seattle WA.

“Do fatty acids of *Chlamys hastata* and *Modiolus modiolus* reflect differing signatures of their macrophyte and phytoplankton derived diets?” 18-Oct-2012. Invited Lecture, Pacific Northwest Shell Club, Seattle, WA

“Fatty acids in marine macrophytes – implications for management”. 10-Apr-2012. Invited Lecture for Washington State Agencies Kelp Ecology Meeting, Friday Harbor, WA.

SYNERGISTIC ACTIVITIES, OUTREACH, and MENTORING

- Research featured in FHL’s TideBites http://depts.washington.edu/fhl/pdf/tidebites/FHLTideBites_v3.pdf
- Graduate student representative for the FHL steering committee (2012–13)
- Outreach/Demonstration Diver for FHL annual open house (2010, 2011, 2012)
- Volunteer mentoring for Technology Access Foundation; improving access of underrepresented minorities to careers and college education in STEM fields (2006)
- Worked with K-12 educators to integrate WA Department of Fish and Wildlife research objectives (terrestrial wildlife ecology) into K-12 curricula (2001-05)
- Mentored, advised, and coauthored papers with 3 students who started graduate school in 2014