

Eric J. Ward

Statistician & Research Biologist

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Education

University of Washington, Ph.D. Aquatic and Fishery Sciences 2003-2006
- Committee: Ray Hilborn (advisor), Andre Punt, Tim Essington

Montana State University, MSc Biology 2000-2003
- Advisor: Dan Goodman

University of California San Diego, BSc Ecology and Evolution 1995-1999

Employment

Statistician Northwest Fisheries Science Center, NMFS (NOAA) 2009 - present

Affiliate Associate Professor University of Washington (SAFS) 2013 - present

Post-doctoral researcher National Research Council 2007 - 2008

Stock assessment scientist Wellington, New Zealand Spring 2005

Graduate research assistant University of Washington 2003 - 2006

Journal Articles (peer - reviewed)

68. Anderson, S.C., **E.J. Ward**, A.O. Shelton, M.D. Adkison, A.H. Beaudreau, R.E. Brenner, A.C. Haynie, J.C. Shriver, J.T. Watson, and B.C. Williams. Benefits and risks of diversification for individual fishers. *Proceedings of the National Academy of Sciences*, in press
67. Linder, H., J.K. Horne, and **E.J. Ward**. 2017. Modeling baseline conditions of ecological indicators: Marine renewable energy environmental monitoring. *Ecological Indicators*, 83: 178-191.
66. Deacy, W.W., J.B. Armstrong, W.B Leacock, C. Robbins, D.D. Gustine, **E.J. Ward**, J.A. Erlenbach, J.A. Stanford. Phenological synchronization disrupts a keystone trophic interaction between Kodiak brown bears and salmon. *Proceedings of the National Academy of Sciences*, in press
65. Shelton, A.O., M.E. Hunsicker, **E.J. Ward**, B.E. Feist, R. Blake, C.L. Ward, B.C. Williams, J.T. Duffy-Anderson, A.B. Hollowed, A.C. Haynie. Spatio-temporal models reveal subtle changes to demersal communities following the Exxon Valdez oil spill. *ICES Journal of Marine Science*, fsx079
64. **Ward, E.J.**, M. Adkison, J. Couture, S.C. Dressel, M.A. Litzow, S. Moffitt, T. Hoem Neher, J. Trochta, and R. Brenner. 2017. Evaluating signals of oil spill impacts,

- climate, and species interactions in Pacific herring and Pacific salmon populations in Prince William Sound and Copper River, Alaska. *PLOS ONE*, 12(3): e0172898.
63. Hussey, N., J. DiBattista, J. Moore, **E.J. Ward**, A. Fisk, S. Kessel, T. Guttridge, K. Feldheim, B. Franks, S. Gruber, O. Weideli, and D. Chapman. Risky business for a marine predator? Testing the influence of foraging strategies on size and growth rate under natural conditions. *Proceedings of the Royal Society Series B*, 284(1852): 20170166.
 62. Chasco, B., I.C. Kaplan, A. Thomas, A. Acevedo-Gutiérrez, D.P. Noren, M.J. Ford, M.B. Hanson, J. Scordino, S.J. Jeffries, S.F. Pearson, K.N. Marshall, and **E.J. Ward**. 2017. Estimates of Chinook salmon consumption in Washington State inland waters by four marine mammal predators from 1970 – 2015. *Canadian Journal of Fisheries and Aquatic Sciences*, 74(8): 1173-1194. [link](#)
 61. Moriarty, P., T.E. Essington, and **E.J. Ward**. 2017. A novel method to estimate prey contributions to predator diets. *Canadian Journal of Fisheries and Aquatic Sciences*, 74: 168-177. [link](#)
 60. Armstrong, J.B., **E.J. Ward**, D.E. Schindler, and P.J. Lisi. 2016. Adaptive capacity at the northern front: sockeye salmon behaviorally thermoregulate during novel exposure to warm temperatures. *Conservation Physiology*, 4(1): cow039. [link](#)
 59. Boyd, C., D.P. DeMaster, R.S. Waples, **E.J. Ward**, and B.L. Taylor. 2016. Consistent Extinction Risk Assessment under the U.S. Endangered Species Act. *Conservation Letters*, 10(3): 328-336. [link](#)
 58. Stier, A.C., J.F. Samhouri, M. Novak, K.N. Marshall, **E.J. Ward**, R.D. Holt, and P.S. Levin. Ecosystem context and historical contingency in apex predator recoveries. *Science Advances*, 5(2): e1501769. [link](#)
 57. Adams, J.B., I.C. Kaplan, B. Chasco, K.N. Marshall, A. Acevedo-Gutiérrez, and **E.J. Ward**. 2016. A century of Chinook salmon consumption by marine mammal predators in the Northeast Pacific Ocean. *Ecological Informatics*, 34: 44-51. [link](#)
 56. Thorson, J.T., M.L. Pinsky, and **E.J. Ward**. 2016. Model-based inference for estimating shifts in species distribution, area occupied, and center of gravity. *Methods in Ecology and Evolution*, 7: 990-1002. [link](#)
 55. Jorgensen, J.C., **E.J. Ward**, M.D. Scheuerell, and R.W. Zabel. 2016. Assessing spatial covariance among time series of abundance. *Ecology and Evolution*, 6: 2472-2485. [link](#)
 54. **Ward, E.J.**, M.E. Dahlheim, J.M. Waite, C.K. Emmons, K.N. Marshall, B.E. Chasco, K.C. Balcomb III. 2016. Long distance migration of prey synchronizes demographic rates of top predators across broad spatial scales. *Ecosphere*, 7(2): e01276. [link](#)
 53. Ono, K., A.O. Shelton, **E.J. Ward**, J.T. Thorson, B.E. Feist, and R. Hilborn. 2016. Space-time investigation of the effects of fishing on fish populations. *Ecological Applications*, 26(2): 392-406. [link](#)
 52. Marshall, K.N., A.C. Stier, J.F. Samhouri, R.P. Kelly, and **E.J. Ward**. 2016. Conservation challenges of predator recovery. *Conservation Letters*, 9: 70-78. [link](#)

51. Galloway, A.W.E., M.T. Brett, G.W. Holtgrieve, **E.J. Ward**, A.P. Ballantyne, C.W. Burns, M.J. Kainz, D.C. Muller-Navarra, J. Persson, J.L. Ravet, U. Strandberg, S.J. Taipale. 2015. A Fatty acid based Bayesian approach for inferring diet in aquatic consumers. *PLoS ONE*, 10(6): e0129723. [link](#)
50. P.A.H. Westley, A.H. Dittman, **E.J. Ward**, and T. Quinn. 2015. Signals of climate, conspecific density, and watershed features in patterns of homing and dispersal by Pacific salmon. *Ecology*, 96: 2823–2833. [link](#)
49. **Ward, E.J.**, Y.W. Lee, K. Ono, A.O. Shelton, and J.T. Thorson. 2015. Using spatiotemporal species distribution models to identify temporally evolving hotspots of species co-occurrence. *Ecological Applications*, 25: 2198-2209. [link](#)
48. Bjorkland, R.K., S. Pearson, S. Jeffries, M. Lance, A. Acevedo-Gutierrez, and **E.J. Ward**. 2015. Stable isotope mixing models elucidate sex and size effects on the diet of a generalist marine predator. *Marine Ecology Progress Series*, 526: 213-225. [link](#)
47. **Ward, E.J.**, J.H. Anderson, T.J. Beechie, G.R. Pess, and M.J. Ford. 2015. Increasing hydrologic variability threatens depleted anadromous fish populations. *Global Change Biology*, 21: 2500-2509. [link](#)
46. Sergeant, C.J., J.B. Armstrong, and **E.J. Ward**. 2015. Predator-prey migration phenologies remain synchronised in a warming catchment. *Freshwater Biology*, 60: 724-732. [link](#)
45. Thorson, J.T., A.O. Shelton, **E.J. Ward**, and H. Skaug. 2015. Geostatistical delta-generalized linear mixed models improve precision for estimated abundance indices for West Coast groundfishes. *ICES Journal of Marine Science*, 72: 1297-1310. [link](#)
44. **Ward, E.J.**, K.N. Marshall, A. Sedgley, T. Ross, T. Hass, S.F. Pearson, G. Joyce, N.J. Hamel, P.J. Hodum, R. Faucett. 2015. Using citizen-science data to identify local hotspots of seabird occurrence. *PeerJ*, 2: e704. [link](#)
43. Thorson, J.T., H. Skaug, K. Kristensen, A.O. Shelton, **E.J. Ward**, J. Harms, and J. Benante. 2015. The importance of spatial models for estimating the type and strength of density dependence. *Ecology*, 96: 1202–1212. [link](#)
42. Thorson, J.T., J.M. Cope, K.M. Kleisner, J.F. Samhoury, A.O. Shelton, and **E.J. Ward**. 2015. Giants' shoulders 15 years later: Lessons, challenges, and guidelines in fisheries meta-analysis. *Fish and Fisheries*, 16: 342-361. [link](#)
41. Phillips, D.L., R. Inger, S. Bearhop, A.L. Jackson, J.W. Moore, A.C. Parnell, B.X. Semmens, and **E.J. Ward**. 2014. Best practices for use of stable isotope mixing models in food-web studies. *Canadian Journal of Zoology*, 92: 823-835. [link](#)
40. Anlauf-Dunn, K., **E.J. Ward**, and M. Strickland. 2014. Habitat connectivity, complexity and quality: Predicting adult coho salmon occupancy and abundance. *Canadian Journal of Fisheries and Aquatic Sciences*, 71: 1864-1876. [link](#)
39. Chasco, B., **E.J. Ward**, C. Rabe, R. Orme, R. Kinzer, J. Vogel, J. Hesse, P. Kucera. 2014. Evaluating the accuracy and precision of multiple abundance estimators using state-space models: a case study for a threatened population of Chinook

- salmon in Johnson Creek, Idaho. *North American Journal of Fisheries Management*, 34(5): 945-954. [link](#)
38. Shelton, A.O., J.T. Thorson, **E.J. Ward**, and B.E. Feist. 2014. Spatial semi-parametric models improve estimates of species abundance and distribution. *Canadian Journal of Fisheries and Aquatic Sciences*, 71: 1655-1666. [link](#)
 37. **Ward, E.J.**, E.E. Holmes, J.T. Thorson, and B. Collen. 2014. Complexity is costly: a meta-analysis of parametric and non-parametric methods for short-term population forecasting. *Oikos*, 123(6): 652-661. *Selected for Editor's Choice June 2014*. [link](#)
 36. J.T. Thorson and **E.J. Ward**. 2014. Accounting for vessel effects when standardizing catch rates from cooperative surveys. *Fisheries Research*, 155: 168-176. [link](#)
 35. Nosrati, K., G. Govers, B.X. Semmens, and **E.J. Ward**. 2014. A mixing model to incorporate uncertainty in sediment fingerprinting. *Geoderma*, 217/218: 173-180. [link](#)
 34. Bodey, T., **E.J. Ward**, R.A. Phillips, R.A.R. McGill, and S. Bearhop. 2014. Species versus guild level differentiation revealed across the annual cycle by isotopic niche examination. *Journal of Animal Ecology*, 83: 470-478. [link](#)
 33. Hampton, S.E., E.E. Holmes, D.E. Pendleton, L.P. Scheef, M.D. Scheuerell, and **E.J. Ward**. 2013. Quantifying effects of abiotic and biotic drivers on community dynamics with multivariate autoregressive (MAR) models. *Ecology*, 94(12): 2663-2669. *Recommended by Faculty of 1000 Biology* [link](#)
 32. B.X. Semmens, **E.J. Ward**, A.C. Parnell, D.L. Phillips, S. Bearhop, R. Inger, A.L. Jackson, and J.W. Moore. 2013. Statistical basis and outputs of stable isotope mixing models: Comment on Fry 2013. *Marine Ecology Progress Series*, 490: 285-289. [link](#)
 31. M.B. Hanson, C. Emmons, **E.J. Ward**, J. Nystuen, and M. Lammers. 2013. Assessing the coastal occurrence of endangered killer whales using autonomous passive acoustic recorders. *Journal of the Acoustical Society of America*, 134(5): 3486-3495. [link](#)
 30. Parnell, A.C., D.L. Phillips, S. Bearhop, A.L. Jackson, B.X. Semmens, **E.J. Ward**, J.W. Moore, and R.L. Inger. 2013. Bayesian Stable Isotope Mixing Models. *Environmetrics*, 24(6): 387-399. [link](#)
 29. Thorson, J.T. and **E.J. Ward**. 2013. Accounting for space-time interactions in index standardization models. *Fisheries Research*, 147: 426-433. [link](#)
 28. Holtgrieve, G.W., M.E. Arias, K.N. Irvine, **E.J. Ward**, M. Kumm, J. Koponen, and J.E. Richey. 2013. Patterns of ecosystem metabolism in the Tonle Sap Lake, Cambodia with links to capture fisheries. *PLoS One*, 8(8):e71395, 1-11. [link](#)
 27. Van Daele, M.B., B.X. Semmens, **E.J. Ward**, L.J. Van Daele, W.B. Leacock, C.T. Robbins. 2013. Salmon consumption by Kodiak brown bears (*Ursus arctos middendorffi*) with ecosystem management implications. *Canadian Journal of Zoology*, 91: 164-174. [link](#)

26. Westley, P., **E.J. Ward**, and I. Fleming. 2013. Fine-scale local adaptation in an invasive freshwater fish has evolved in contemporary time. *Proceedings of the Royal Society, Series B.*, 280(751). [link](#)
25. **Ward, E.J.**, G.R. Pess, K. Anlauf-Dunn, and C.E. Jordan. 2012. Applying time series models with spatial correlation to identify the scale of variation in habitat metrics related to threatened coho salmon (*Oncorhynchus kisutch*) in the Pacific Northwest. *Canadian Journal of Fisheries and Aquatic Sciences*, 69(11): 1773-1782. [link](#)
24. **Ward, E.J.**, P.S. Levin, M.M. Lance, S.J. Jeffries, and A. Acevedo-Gutiérrez. 2012. Integrating diet and movement data to identify hot spots of predation risk and areas of conservation concern for endangered species. *Conservation Letters*, 5(1): 27-37 dpi: 10.1111/j.1755-263X.2011.00210.x. [link](#)
23. Holmes, E.E., **E.J. Ward**, and K. Wills. 2012. MARSS: multivariate autoregressive state-space models for analyzing time series data. *R Journal*, 4(1): 11-19. [link](#)
22. Holtgrieve, G., D.E. Schindler, W.O. Hobbs, P.R. Leavitt, **E.J. Ward**, L. Bunting, G. Chen, B.P. Finney, I. Gregory-Eaves, S. Holmgren, M.J. Lisac, P.J. Lisi, K. Nydick, L.A. Rogers, J.E. Saros, D.T. Selbie, M.D. Shapley, P.B. Walsh, and A.P. Wolfe. 2011. A coherent signature of anthropogenic nitrogen deposition to remote watersheds of the Northern Hemisphere. *Science*, 16: 1545-1548. doi: 10.1126/science.1212267. [link](#)
21. Yeakel, J.D., M. Novak, P.R. Guimarães Jr., N.J. Dominy, P.L. Koch, **E.J. Ward**, J.W. Moore, and B.X. Semmens. 2011. Merging resource availability with isotope mixing models: the role of neutral interaction assumptions. *PLoS ONE*, 6(7): e22015. [link](#)
20. Anderson, J., **E.J. Ward**, and S.M. Carlson. 2011. A model for estimating the minimum number of offspring to sample in studies of reproductive success. *Journal of Heredity*, 102(5): 567-576. [link](#)
19. Berntson, E.A., R.W. Carmichael, M.W. Flesher, **E.J. Ward**, and P. Moran. 2011. Diminished reproductive success of steelhead from a hatchery supplementation program (Little Sheep Creek, Imnaha Basin, Oregon). *Transactions of the American Fisheries Society*, 140(3): 685-698. [link](#)
18. Francis, T.B., D.E. Schindler, G.W. Holtgrieve, E. Larson, M.D. Scheuerell, B.X. Semmens, and **E.J. Ward**. 2011. Habitat structure determines resource use by zooplankton in temperate lakes. *Ecology Letters*, 14: 364-372. [link](#)
17. **Ward, E.J.**, Semmens, B.X., Phillips, D.L., Moore, J.W., and Bouwes, N. 2011. A quantitative approach to combine sources in stable isotope mixing models. *Ecosphere*, 2(2):art19. [link](#) joint 1st authorship
16. **Ward, E.J.**, Semmens, B.X., Holmes, E.E., and K.C. Balcomb. 2011. Effects of multiple levels of social organization on survival and abundance. *Conservation Biology*, 25(2): 350-355. [link](#)
15. **Ward, E.J.**, Zerbini, A.N., Engel, M.E., Kinas, P.G. and Andriolo, A. 2011. Estimates of population growth rates of humpback whales (*Megaptera novaeangliae*)

- in the wintering grounds off the coast of Brazil (Breeding Stock A). *J. Cet Res. Manage.* (Special Issue), 3: 145-149.
14. Zerbini, A.N., **E.J. Ward**, Engel, M.E., Kinas, P.G. and Andriolo, A. 2009. A Bayesian assessment of the conservation status of humpback whales (*Megaptera novaeangliae*) in the Western South Atlantic (Breeding Stock A). *J. Cet Res. Manage.*, SC/58/SH02.
 13. **Ward, E.J.**, B.X. Semmens, and D.E. Schindler. 2010. Including source uncertainty and prior information in the analysis of stable isotope mixing models. *Environmental Science & Technology*, 44(12): 4645-4650. [link](#)
 12. Williamson, K.S., A.R. Murdoch, T.N. Pearsons, **E.J. Ward**, and M.J. Ford. 2010. Factors influencing the relative fitness of hatchery and wild spring Chinook salmon in the Wenatchee River, Washington, USA. *Canadian Journal of Fisheries and Aquatic Sciences*, 67: 1840-1851. [link](#)
 11. Warren, D.R., M.M. Mineau, **E.J. Ward**, and C.E. Kraft. 2010. Relating fish biomass to habitat and chemistry in headwater streams of the northeastern United States. *Environmental Biology of Fishes*, 88: 51-62. [link](#)
 10. **Ward, E.J.**, H. Chirrakal, M. González-Suárez, D. Aurióles-Gamboa, E.E. Holmes, L. Gerber. 2010. Applying Multivariate state-space models to detect spatial clustering of California sea lions in the Gulf of California, Mexico. *Journal of Applied Ecology*, 47: 47-56. *Recommended by Faculty of 1000 Biology* [link](#)
 9. Semmens, B.X., **E.J. Ward**, J.W. Moore, and C.T. Darimont. 2009. Quantifying inter- and intra-population niche variability using hierarchical Bayesian stable isotope mixing models. *PLoS ONE*, 4(7): e6187. *joint 1st authorship* [link](#)
 8. **Ward, E.J.**, E.E. Holmes, and K.C. Balcomb. 2009. Quantifying the effects of prey abundance on killer whale reproduction. *Journal of Applied Ecology*, 46(3): 632-640. [link](#)
 7. Semmens, B.X., J. Moore, and **E.J. Ward**. 2009. Improving Bayesian isotope mixing models: a response to Jackson et al. *Ecology Letters*, 12(3): E6-E8. [link](#)
 6. **Ward, E.J.**, E.E. Holmes, K. Parsons, KC Balcomb, and JKB Ford. 2009. The role of menopause and reproductive senescence in a long-lived social mammal. *Frontiers in Zoology*, 6(4). [link](#)
 5. **Ward, E.J.** 2008. A review and comparison of four commonly used Bayesian and maximum likelihood model selection tools. *Ecological Modelling*, 211: 1-10. [link](#)
 4. **Ward, E.J.**, R. Hilborn, R.G. Towell, and L. Gerber. 2007. A state-space mixture approach for estimating catastrophic events in time series data. *Canadian Journal of Fisheries and Aquatic Sciences*, 64: 899-910. [link](#)
 3. **Ward, E.J.** 2006. A new BEAST: Bayesian software tools for ecological trend analysis. *Wildlife Society Bulletin*, 34: 1420-1424. [link](#)
 2. Branch, T., A. Haynie, R. Hilborn, G. Fay, L. Flynn, J. Griffiths, K. Marshall, J. Randall, J. Scheurell, **E.J. Ward**, and M. Young. 2006. Fleet dynamics and

fishermen behavior: lessons for fisheries managers. *Canadian Journal of Fisheries and Aquatic Sciences*, 63: 1647-1668. [link](#)

1. **Ward, E.J.** 2005. Differences between fishery-dependent and fishery-independent estimates of single-species and mixed-species dolphin schools: implications for single-species stock assessments. *Marine Mammal Science*, 21: 189-203. [link](#)

Technical Reports

12. Ferguson, L., M. Srinivasan, E. Oleson, S. Hayes, S.K. Brown, R. Angliss, J. Carretta, E. Holmes, **E.J. Ward**, J. Kocik, K. Mullin, R. Dean, and J. Davis (eds.). 2017. Proceedings of the First National Protected Species Assessment Workshop. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-F/SPO-172, 92 p. [link](#)
11. Denton, K., M. McHenry, R. Moses, **E.J. Ward**, M. Liermann, O. Stefankiv, W. Wells and G. Pess. 2016 Elwha River Steelhead Escapement Estimate Based on DIDSON/ARIS Multi-Beam SONAR Data.
10. Denton, K., M. McHenry, R. Moses, **E.J. Ward**, M. Liermann, O. Stefankiv, W. Wells and G. Pess. 2016 Elwha River Chinook Escapement Estimate Based on DIDSON/ARIS Multi-Beam SONAR Data.
9. Gustafson, R.G., L. Weitkamp, Y.W. Lee, **E.J. Ward**, K. Somers, V. Tuttle, and J. Jannot. 2016. Status Review Update of Eulachon (*Thaleichthys pacificus*) Listed under the Endangered Species Act: Southern Distinct Population Segment. [link](#)
8. Gerrodette, T., **E.J. Ward**, R.L. Taylor, L.K. Schwarz, T. Eguchi, P.R. Wade, and G.K. Himes-Boor. 2016. Daniel Goodman's empirical approach to Bayesian statistics. Pre-print at PeerJ [link](#)
7. Denton, K., M. McHenry, R. Moses, **E.J. Ward**, M. Liermann, O. Stefankiv, W. Wells and G. Pess. 2015 Elwha River Steelhead Escapement Estimate Based on DIDSON/ARIS Multi-Beam SONAR Data.
6. Denton, K., M. McHenry, R. Moses, **E.J. Ward**, M. Liermann, O. Stefankiv, W. Wells and G. Pess. 2015 Elwha River Chinook Escapement Estimate Based on DIDSON/ARIS Multi-Beam SONAR Data.
5. Denton, K., M. McHenry, R. Moses, **E.J. Ward**, M. Liermann, O. Stefankiv, W. Wells and G. Pess. 2014 Elwha River Steelhead Escapement Estimate Based on DIDSON/ARIS Multi-Beam SONAR Data.
4. Denton, K., M. McHenry, R. Moses, **E.J. Ward**, M. Liermann, O. Stefankiv, W. Wells and G. Pess. 2014 Elwha River Chinook Escapement Estimate Based on DIDSON/ARIS Multi-Beam SONAR Data.
3. **E.J. Ward**, M.J. Ford, R.G. Kope, J.K.B. Ford, A. Velez-Espino, C.K. Parken, L. LaVoy, M.B. Hanson, K.C. Balcomb. Estimating the impacts of Chinook salmon abundance and prey removal by ocean fishing on Southern Resident killer whale population dynamics. 2013. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-123, 71 p. [link](#)

2. Stout, H.A., P.W. Lawson, D.L. Bottom, T.D. Cooney, M.J. Ford, C.E. Jordan, R.G. Kope, L.M. Kruzic, G.R. Pess, G.H. Reeves, M.D. Scheuerell, T.C. Wainwright, R.S. Waples, **E.J. Ward**, L.A. Weitkamp, J.G. Williams, and T.H. Williams. 2012. Scientific conclusions of the status review for Oregon coast coho salmon (*Oncorhynchus kisutch*). U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-118, 242 p. [link](#)
1. Northwest Fisheries Science Center. 2011. Risk assessment of U.S. West Coast groundfish fisheries to threatened and endangered marine species. NWFSC, NMFS. 2725 Montlake Blvd E, Seattle, WA. [link](#)

Book Chapters

E.J. Ward 2012. Population Dynamics. In *Grzimek's Animal Life Encyclopedia*. pp. 195- 208.

Teaching Experience

FISH 507: Applied Time Series Analysis, University of Washington 2012 - present
Co-taught course with Eli Holmes and Mark Scheuerell [webpage](#)

Ecological Society of America (ESA) 2008 - 2011
Co-taught Analysis of Multivariate Time-Series Data Using State-Space Models, and Introduction to MARSS

NWFSC R workshop (organized & taught) 2010 - 2011

Visiting lecturer University of Washington 2007 - 2009
Taught FSH 497 Introductory modeling and programming course

External Funding

2018-2020 L. Hauser, B. Vadopalas, R. Childer, B. Hudson, B. Eudeline, and E.J. Ward. *Development of genetic risk assessment tools and Management Strategy Evaluation for Aquaculture of Native Shellfish*. Saltonstall-Kennedy Grant, \$299K.

2017-2018 E.J. Ward, G. Holtgrieve, C. Harvey. *Reconstructing a century of coastal ecosystem productivity and marine mammal trophic dynamics using compound-specific stable isotopes from archival bone specimens*. NWFSC Internal Grants Program

2016-2018 T.E. Essington, T.B. Francis, C. Greene, L. Kuehne, D. Lowry, E.J. Ward. *Recovering historical baselines in Puget Sound*. Washington Sea Grant, \$243K.

2016 E.J. Ward *Improving bycatch estimation through spatial statistics* \$100K.

2015 E.J. Ward, A.O. Shelton and M.J. Ford. *Portfolio Effects in Historic Chinook Hatchery Practices on Prey Availability for Southern Resident Killer Whales* National Fish and Wildlife Foundation, \$110K.

2014-2015 I. Kaplan, E.J. Ward, et al. *A spatially explicit ecosystem model for quantifying marine mammal impacts on Chinook salmon* Pacific Salmon Commission Southern Fund, \$206K.

2013-2014 T. Eguchi, E.J. Ward, and E.E. Holmes. *Developing risk assessment tools for marine sea turtles* \$100K.

2013-2014 Holmes, E.E. and E.J. Ward. *Developing web based computing tools for protected species.* \$200K.

2013 M.B. Hanson, E.J. Ward. et al. *Modeling the distribution of endangered killer whales in Pacific Northwest Navy ranges using acoustic recorder detections and satellite tagged whales,* US Navy.

2013 Shelton, A.O., E.J. Ward, J.T. Thorson, M. Bellman, B. Feist. *Integrating spatial habitat and fisheries effort data to improve abundance estimates of west coast groundfish.* \$56K.

2011 E.J. Ward et al., *Incorporating multiple data sources into a unified framework to improve estimates of adult salmon returns and population productivity.* \$33K.

2009 NSF *Comparative Analysis of Marine Ecosystem Organization: New statistical tools for analyzing community dynamics with applications to marine zooplankton,* \$347K (141K from NCEAS). Associate Investigator (Principal Investigator - E.E. Holmes)

Fellowships and Awards

2006 *Cumulative Risk Assessment for Endangered Species* 2 year NRC post-doc awarded \$92K.

2003 *National Marine Fisheries Service / Washington Sea Grant Fellowship in Population Dynamics: Incorporating model selection and decision analysis into population dynamics modeling.* Grant awarded for \$120K.

Post-docs

2012 Jim Thorson (NRC Research Post-doc). With Michelle McClure, Eli Holmes, and Mark Scheuerell

2012-2013 Guillaume Bal (NRC Research Post-doc). Co-supervised with Eli Holmes and Mark Scheuerell

2015-2017 Sean Anderson (Smith Fellow). Co-supervised with Trevor Branch

2017- Ben Nelson (NWFSC). Co-supervised with Ole Shelton

2017- Lewis Barnett (NWFSC)

Supervised Graduate Students or Committees

2017- Natalie Lowell (L. Hauser), SAFS, University of Washington

2017- Megan Feddern (G. Holtgrieve), SAFS, University of Washington

2012-2017 Pam Moriarty (T. Essington), SAFS, University of Washington

2013-2016 Brandon Chasco (S. Heppell) Oregon State University

2014-2015 Brian Stock (B. Semmens) SIO, with Tomo Eguchi

2015-2016 Hannah Linder (J. Horne) UW

Service and Outreach

Subject Editor, Ecological Applications 2013 - present

Puget Sound Seabird Survey 2005-present

Developed survey methodology for Puget Sound's first land-based citizen science seabird survey and oversaw data analysis

Orca Bowl Washington State Sea Grant / University of Washington

Secretary & Treasurer, Statistical Ecology Section, Ecological Society of America 2010-2012