

# Ryan P. Kelly

University of Washington, School of Marine and Environmental Affairs  
rpkelly@uw.edu      206.616.0185      [kellyresearchlab.com](http://kellyresearchlab.com)

## **Education**

**J.D.** 2011, University of California, Berkeley. School of Law (Boalt Hall).  
**Ph.D.** 2006, Columbia University, New York. Ecology, Evolution, and Environmental Biology.  
**M.Phil.** 2005, Columbia University, New York. Ecology, Evolution, and Environmental Biology.  
**M.A.** 2003, Columbia University, New York. Ecology, Evolution, and Environmental Biology.  
**B.Sc.** 2000, University of California, Los Angeles. Ecology and Evolution.

## **Employment History**

March 2013 – Present: Assistant Professor, University of Washington, School of Marine and Environmental Affairs  
September 2011 – March 2013: Fellow, Center for Ocean Solutions, Stanford University.  
June 2010 – May 2011: Affiliated researcher, Center for Ocean Solutions, Stanford University.  
August 2009 – May 2011: Graduate Student Instructor, UC Berkeley.  
May – August 2009: Sierra Club Environmental Law Program, Summer Associate.  
September 2006 – August 2008: Postdoctoral researcher, Stanford University.  
August 2002 – May 2006: Graduate student and teaching assistant, Columbia University.  
August 2003 – May 2005: Science enrichment teacher, 7th and 8<sup>th</sup> Grades, New York City.  
Spring 2002: Staff Assistant, United States Senator Barbara Boxer, Washington, D.C.  
September 2000 – June 2001: Graduate Teaching Fellow, UCLA.

## **Research Interests**

My interests span the divide between hard scientific data and policymakers' use of those data. My research joins genetic and ecological research with real-world implementation in law and policy, particularly with respect to environmental monitoring, resource management, endangered species, and ocean acidification.

## **Research Experience**

March 2013 – Present: Principal Investigator, University of Washington. Research focuses on environmental monitoring using environmental DNA, ocean acidification policy, environmental management using ecosystem thresholds, and related topics.  
August 2008 – March 2013: Independent and collaborative work at Stanford University and U.C. Berkeley on ocean policy, marine genetics, and the intersection of scientific data and law.  
September 2006 – August 2008: Postdoctoral work at Stanford University's Hopkins Marine Station in the laboratory of Stephen R. Palumbi. This work focused on the comparative population genetic patterns of Pacific nearshore invertebrates as these relate to a variety of ecological species traits.  
2002 – May 2006: Doctoral research at Columbia University in the laboratory of Rob Desalle at the American Museum of Natural History in New York City, investigating the molecular phylogeny and population-level genetic structure of chitons (Polyplacophora) and other marine invertebrates from the Pacific coast of North America.  
1998 – 2001: Molecular research in the laboratory of David K. Jacobs at UCLA.

## Teaching Experience

2013 - Present: Assistant Professor, University of Washington

*Classes Designed and Taught:* SMEA 500 Introduction to Marine Affairs / Human Dimensions of Global Change in the Marine Environment (Fall 2016); Environmental Studies 250, Data Types and Methods (Fall 2013, 2014, 2015); SMEA 515 Ocean and Coastal Law (Winter 2014, Spring 2015, Spring 2016); SMEA 550B Marine Biodiversity Science, Law, and Policy (Spring 2014); SMEA/OCEAN 591 Marine Science in the Coastal Zone (Winter 2015, 2016).

2012: Instructor, Stanford University

*Class Designed and Taught:* Earth Systems 174/274, Marine Biodiversity Science, Law, and Policy (Fall 2012)

2009 - 2011: Graduate Student Instructor, UC Berkeley.

*Classes Taught:* Biology 1B Field Research Section (Fall 2009 and 2010); Earth and Planetary Sciences C51, Big History (Spring 2010 and 2011)

Fall 2005: Teaching Fellow, Columbia University.

*Class Taught:* Life Science and Evolution for undergraduate non-majors

Fall 2003 - Spring 2006: Science enrichment teacher, 7<sup>th</sup> and 8<sup>th</sup> grades, New York City.

*Description:* Taught weekly science lessons in two public junior high schools as part of the National Science Foundation's GK-12 teaching fellowship program, on topics ranging from human physiology to systematics.

Fall 2000 - Spring 2001: Teaching Assistant, University of California, Los Angeles.

*Classes Taught:* Evolution; Plant Physiology; Physiology of Marine Phytoplankton

## Awards, Grants, and Fellowships

2016 - 2018: Packard Foundation: Assessing the Effects of Ocean Acidification in the Field Using Environmental DNA

2016-2017: National Marine Fisheries Service, Advanced Sampling Techniques Working Group: Estimating Abundances in Nearshore Habitats using Environmental DNA

2015 - 2016: University of Washington Royalty Research Fund, Making eDNA Quantitative

2012 - 2014: Packard Foundation: Environmental DNA as Next Generation Monitoring Tool

2010 - 2011: UC Berkeley Law School Martin S. & Estelle D. Depper Scholarship

2010: UC Berkeley Law School Alexander Marsden "Captain" Kidd Scholarship

2009: UC Berkeley Department of Integrated Biology Outstanding Graduate Student Instructor

2003 - 2006: National Science Foundation GK-12 Teaching Fellowship, New York City

2005: American Museum of Natural History Lerner-Gray Grant for Marine Research

2005: University of California at Davis Genetics Research Conservation Program Grant

2002 - 2003, 2005-2006: Faculty Fellowship, Columbia University, New York City

2000 - 2001: Teaching Fellowship, UCLA; Distinguished Teaching Assistant Award

## Publications

**Kelly, R.P.**, C.J. Closek, J.L. O'Donnell, J.E. Kralj, A.O. Shelton, and J.F. Samhuri. 2016. Genetic and Manual Survey Methods Yield Different and Complementary Views of an Ecosystem. (*submitted*, *Frontiers in Marine Science*).

- Kelly, R.P.**, P. Levin, and K.N. Lee. 2016. Science, Policy, and Data-Driven Decisions in a Data Vacuum. (*in press*, Ecology Law Quarterly).
- Hillier, A., **R.P. Kelly**, and T. Klinger, Narrative Style Influences Citation Frequency in Climate Change Science (*submitted*, PlosOne).
- Kelly, R.P.**, J.L. O'Donnell, N.C. Lowell, A.O. Shelton, J.F. Samhuri, S.M. Hennessey, B.E. Feist, and G.D. Williams. 2016. Genetic Signatures of Ecological Diversity Along an Urbanization Gradient. PeerJ 4:e2444.
- Freeman, M.C., L. Whiting, and **R.P. Kelly**. 2016. Assessing Potential Spatial and Temporal Conflicts in Washington's Marine Waters. Marine Policy 70: 137-144.
- Kelly, R.P.** 2016. Making Environmental DNA Count. Molecular Ecology Resources 16: 10-12.
- Battista, W., **R.P. Kelly**, A. Erickson, and R. Fujita. 2016. A Comprehensive Method for Assessing Marine Resource Governance: Case study in Kāneʻohe Bay, Hawaiʻi. Coastal Management 44: 295-332.
- Lowell, N. and **R.P. Kelly**. 2016. Evaluating Agency Use of “Best Available Science” Under the United States Endangered Species Act. Biological Conservation 196:53-59.
- Port, J.A., J.L. O'Donnell, O.C. Romero-Maraccini, P.R. Leary, S.Y. Litvin, K.J. Nickols, and **R.P. Kelly**. 2016. Assessing the Vertebrate Community of a Kelp Forest Ecosystem using Environmental DNA. Molecular Ecology 25(2):527-541.
- O'Donnell, J.L., **R.P. Kelly**, N. Lowell, and J.A. Port. 2016. Indexed PCR Primers Induce Template-Specific Bias in Large-Scale DNA Sequencing Studies. PLoS One 11(3): e0148698.
- Shelton, A.O., J. L. O'Donnell, J.F. Samhuri, N. Lowell, G.D. Williams, and **R.P. Kelly**. 2016. A Framework for Inferring Biological Communities from Environmental DNA. Ecological Applications 26(6):1645-1659.
- Albright, R., D. Alongi, K. Anthony, M. Baird, M. Byrne, C. Collier, S. Dove, K. Fabricius, T. Fyffe, K. Gale, C. Hanratty, O. Hoegh-Guldberg, **R.P. Kelly**, J. Lough, M. Mongin, J. Monks, P. Munday, J.K. Oliver, R. Pears, M. Rodgers, B. Russell, B. Tilbrook, E. Abal. 2016. Ocean Acidification: Linking Science to Adaptive Management Solutions. Journal of Environmental Management 182: 641-650.
- Gattuso, J.-P., A. Magnan, R. Billé, W.W.L. Cheung, E.L. Howes, F. Joos, D. Allemand, L. Bopp, S. Cooley, C.M. Eakin, O. Hoegh-Guldberg, **R.P. Kelly**, H.-O. Pörtner, A.D. Rogers, J.M. Baxter, D. Laffoley, D. Osborn, A. Rankovic, J. Rochette, U.R. Sumaila, S. Treyer, C. Turley. 2015. Contrasting Futures for Ocean and Society from Different CO<sub>2</sub> Emissions Scenarios. Science 349 (6243): aac4722.
- Marshall, K., A. Stier, J. Samhuri, **R.P. Kelly**, E. Ward. 2015. Conservation Challenges of Predator Recovery. Conservation Letters 9(1): 70-78.
- Selkoe, K.A., T. Blenckner, M.R. Caldwell, L. Crowder, A. Erickson, T. Essington, J. Estes, R. Fujita, B.S. Halpern, M. Hunsicker, C.V. Kappel, **R.P. Kelly**, J.N. Kittinger, P.S. Levin, J. Lynham, M. Mach, R. Martone, L. Mease, A. Salomon, J. Samhuri, C. Scarborough, A. Stier, C. White, J. Zedler. 2015. Principles for Managing Marine Ecosystems Prone to Tipping Points. Ecosystem Health and Sustainability 1(5):17.
- Kelly, R.P.**, A.L. Erickson, and L.A. Mease. 2015. How Not to Fall Off a Cliff, or, Using Tipping Points to Improve Environmental Management. 41 Ecology Law Quarterly 843.
- Kelly, R.P.** 2015. Will More, Better, Cheaper, and Faster Monitoring Improve Environmental Management? 44 Environmental Law 1111-1147.

- Kelly, R.P.**, J.A. Port, K.M. Yamahara, R.G. Martone, N. Lowell, P.F. Thomsen, M.E. Mach, E. Prahler, M.R. Caldwell, and L.B. Crowder. 2014. Harnessing DNA to Improve Environmental Management, *Science* 344 (6191): 1455-1456. doi:10.1126/science.1251156.
- Kelly, R.P.**, J.A. Port, K.M. Yamahara, and L. Crowder. 2014. Using Environmental DNA to Census Marine Fishes in a Large Mesocosm. *PLoS ONE* 9(1): e86175. doi:10.1371/journal.pone.0086175.
- Strong, A.L., K.J. Kroeker, L.T. Teneva, L.A. Mease, and **R.P. Kelly**. 2014. Ocean Acidification 2.0: Managing Our Changing Coastal Ocean Chemistry. *BioScience*: doi: 10.1093/biosci/biu072.
- Kelly, R.P.**, A. Erickson, L. Mease, W. Battista, J. Kittinger, R. Fujita. 2014. Embracing Thresholds for Better Environmental Management. *Philosophical Transactions of the Royal Society B* 370: 20130276.
- Kelly, R.P.**, S.R. Cooley, T. Klinger. 2013. Narratives Can Motivate Environmental Action: The Whiskey Creek Ocean Acidification Story. *Ambio* 43(5): 592-599.
- Kelly, R.P.**, and M. Caldwell. 2013. "Not Supported by Current Science" : The National Forest Management Act and the Lessons of Environmental Monitoring for the Future of Public Resources Management. *32 Stanford Environmental Law Journal* 151.
- Kelly, R.P.**, and M. Caldwell. 2013. Ten Ways States Can Fight Ocean Acidification (and Why They Should). *37 Harvard Environmental Law Review* 57. [REPRINTED in: *6 Washington Journal of Law and Policy* 288 (2016)].
- Billé, R., **R.P. Kelly**, A. Biastoch, E. Harrould-Kolieb, D. Herr, F. Joos, K. Kroeker, D. Laffoley, A. Oschlies, and J.-P. Gattuso. 2013. Taking Action Against Ocean Acidification: A Review of Management and Policy Options. *Environmental Management* 52(4): 761-779.
- Caldwell, M. R., Hartge, E. H., Ewing, L. C., Griggs, G., **Kelly, R. P.**, Moser, S. C., Newkirk, S. G., Smyth, R. A., & Woodson, C. B. 2013. Chapter 9: Coastal Issues. In: Garfin, G., Jardine, A., Merideth, R., Black, M., & LeRoy, S. (Eds.), *Assessment of Climate Change in the Southwest United States: a Report Prepared for the National Climate Assessment*. A report by the Southwest Climate Alliance. Washington, DC: Island Press.
- Kelly, R.P.**, and M.R. Caldwell. 2012. The Limits of Water Quality Criteria. *The Environmental Forum* 29(6): 34-38.
- Kelly, R.P.**, and J. Grote Stoutenburg. 2012. Washington State's Legal and Policy Options for Combating Ocean Acidification in State Waters. Center for Ocean Solutions. (Available at: [http://www.ecy.wa.gov/water/marine/oa/2012report\\_app8.pdf](http://www.ecy.wa.gov/water/marine/oa/2012report_app8.pdf)).
- Kelly, R.P.**, and M. Caldwell. 2012. Why Ocean Acidification Matters to California, and What California Can Do About It. Center for Ocean Solutions. (Available at: <http://www.centerforoceansolutions.org/publications/all>).
- Kelly, R.P.**, M.M. Foley, W. Fisher, R. Feely, B.S. Halpern, G.G. Waldbusser, and M.R. Caldwell. 2011. Mitigating Local Causes of Ocean Acidification with Existing Laws. *Science* 332: 1036-1037.
- Kelly, R.P.** 2011. Spineless Wonders: How Listing Marine Invertebrates and their Larvae Challenges the US Endangered Species Act. *19 Penn State Environmental Law Review* 1-53.
- Barshis, D.J., E.E. Sokta, **R.P. Kelly**, A. Sivasundar, B.A. Menge, J. Barth, and S.R. Palumbi. 2011. Coastal Upwelling May Drive Sweepstakes Recruitment in the Acorn Barnacle *Balanus glandula* *Marine Ecology Progress Series* 439: 139-150.
- Kelly, R.P.** 2010. The Use of Population Genetics in Endangered Species Act Listing Decisions. *37 Ecology Law Quarterly* 1107-1159.

- Kelly, R.P.**, and S.R. Palumbi. 2010. Genetic Structure Among 50 Species of the Northeastern Pacific Rocky Intertidal Community. *PLoS ONE* 5(1): e8594.  
doi:10.1371/journal.pone.0008594
- Kelly, R.P.**, T.A. Oliver, A. Sivasundar, and S.R. Palumbi. 2010. A Method for Detecting Population Genetic Structure in Diverse, High Gene-Flow Species. *Journal of Heredity* 101(4): 423-436.
- Kelly, R.P.**, and S.R. Palumbi. 2009. General-use polymerase chain reaction primers for amplification and direct sequencing of enolase, a single-copy nuclear gene, from different animal phyla. *Molecular Ecology Resources* 9: 144-147.
- Kelly, R.P.**, and D.J. Eernisse. 2008. Reconstructing a Radiation: The Chiton Genus *Mopalia* in the North Pacific. *Invertebrate Systematics* 22: 17-28.
- Kelly, R.P.**, and D.J. Eernisse. 2007. Southern Hospitality: A Latitudinal Gradient in Gene Flow in the Marine Environment. *Evolution* 61(3): 700-707.
- Kelly, R.P.**, I.N. Sarkar, D.J. Eernisse, and R. Desalle. 2007. DNA Barcoding Using Chitons (genus *Mopalia*). *Molecular Ecology Notes* 7: 177-183.
- Kelly, R.P.** 2006. Genetics and Geography in Pacific Coast Chitons (Mollusca; Polyplacophora). PhD Dissertation, Department of Ecology, Evolution, and Environmental Biology. Columbia University, New York City. 276pp.

### Professional Affiliations

California Bar Association (number 278958; admitted 2011)  
Articles Editor, *Ecology Law Quarterly* (2010 - 2011)  
Western Society of Naturalists

### Graduate Students and Postdocs Supervised

*Master's students, School of Marine and Environmental Affairs*

**2013 - 2015:** Natalie Lowell, Mikaela Freeman, Colleen Crotty; **2014 - 2016:** Erin Ryan-Peñuela, Sebastien Clos-Versailles, Gretchen Thuesen, Max Mossler; **2015 - 2017:** Tim Lee, Sara Rosewall, Chris Hart, James Kralj.

*Postdocs*

James L. O'Donnell (Postdoc, 2014 - present)

### Academic Committees

*Master's Degrees, School of Marine and Environmental Affairs*

Raz Barnea (2014); Sarah Towne (2015); Alex Tanz (2016); Annie Hillier (2016); Thea Rogier (2016)

*PhD Committees*

Audrey Ragsac, UW Biology (Richard Olmstead, PI) 2014 - present

Eleni Petrou, UW SAFS (Lorenz Hauser, PI) 2014 - present

Mike Tillotson, UW SAFS (Tom Quinn, PI) 2014 - present

William King, UW Biology (Ken Sebens, PI) 2015 - present

Roxanne Carini UW Civil & Environmental Engineering (Chris Chickadel, PI) 2016 - present

Lyda Harris, UW Biology (Emily Carrington, PI) 2016 - present