Betsy A. Bancroft

Biology and Environmental Studies
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EDUCATION

Ph.D. in Zoology, Oregon State University (2007)
Ultraviolet B radiation as an environmental stressor of amphibians.
Advisor: Andrew R. Blaustein

B.S. in Biology, minor in English Literature, University of Puget Sound (2000)
Chemical ecology and behavior of red wolves (*Canis rufus*)
Pair-bond formation in clouded leopards (*Felis nebulosa*)
Advisor: Edward DeGrauw

CURRENT POSITION

Associate Professor of Biology and Environmental Studies: Gonzaga University (September 2017-current)

PREVIOUS ACADEMIC POSITIONS

Assistant Professor of Biology and Environmental Studies: Gonzaga University (September 2015-August 2017)
Director, Undergraduate Research and Scholarship Program (UGRASP): Southern Utah University (July 2014-July 2015)

Assistant Professor of Biology: Southern Utah University (January 2010-July 2015)

TEACHING AWARDS AND HONORS

Outstanding Educator of the Year, Southern Utah University (2014)
Highest teaching award at SUU
One person selected per year (total full-time faculty: 281)

Distinguished Educator of the Year, Southern Utah University (2012)
Second-highest teaching award at SUU
Three people selected per year (total full-time faculty: 252)

Zoology Department nominee for University-wide Herbert F. Frolander Award for Excellence in Graduate Teaching, Oregon State University (2007)

Teaching Assistant of the Year, University of Puget Sound Department of Biology (2000)

PUBLICATIONS (*Denotes undergraduate co-author, ǂdenotes graduate co-author).

Gervasi, Sǂ., P. Stephens, J. Huaǂ, C. Searle, G. Xieǂ, J. Urbinaǂ, D. Olson, **B. A. Bancroft,** V. Weis, J. Hammond, R. Relyea, and A. R. Blaustein. 2017. Linking epidemiological and ecological traits: heterogeneity in responses to the chytrid fungus across 20 species of North American amphibians. *PLoS ONE* 12:e0167882.

Bancroft, B. A., J. J. Lawler, and N. H. Schumaker. 2016. Weighing the relative potential impacts of climate change and land-use change on an endangered bird. *Ecology and Evolution* 6:4468-4477.

Holmquist, L. M.ǂ, A.M. Ray, **B. A. Bancroft**, N. Pinkham, and M. A. H. Webb. 2014. Effects of ultraviolet-B radiation on woundfin embryos and larvae with application to conservation propagation. *Journal of Fish and Wildlife Management* 5:87-98.

Baker, N. J.ǂ, **B. A. Bancroft**, and T. S. Garcia. 2013. A meta-analysis of the effects of pesticides and fertilizers on survival and growth of amphibians. *Science of the Total Environment* 449:150-156.

Blaustein, A.R., C.L. Searle ǂ, **B. A. Bancroft**, and J.J. Lawler. 2012. Amphibian Population Declines and Climate Change. Pp 29-54 *in* "Ecological Consequences of Climate Change: Mechanisms, Consequences, and Management". Beever, E.A. and Belant, J.L., eds. CRC Press, Taylor and Francis Group, Boca Raton, FL, USA.

Bancroft, B. A., B.A. Han, C.L. Searle ǂ, L.M. Biga ǂ, D.H. Olson, L.B. Kats, J.J. Lawler, and A. R. Blaustein. 2011. Species-level correlates of susceptibility to the pathogenic amphibian fungus *Batrachochytrium dendrobatidis* in the United States. *Biodiversity and Conservation* 20: 1911-1920.

Blaustein, A.R., S.C Walls, **B. A. Bancroft**, J.J. Lawler, C.L. Searle ǂ, and S.S. Gervasi ǂ. 2010. Direct and indirect effects of climate change on amphibian populations. *Diversity* 2: 281-313.

Lawler, J.J., S. Shafer, **B. A. Bancroft**, and A.R. Blaustein. 2010. Projected climate impacts for the amphibians of the western hemisphere. *Conservation Biology* 24(1): 38-50.

Searle, C.S. ǂ, L.K. Belden, **B. A. Bancroft**, B.A. Han, L.F. Michael ǂ and A.R. Blaustein. 2010. Experimental examination of the effects of ultraviolet-B radiation in combination with other stressors in frog larvae. *Oecologia* 162(1): 237-245.

Romansic, J. M., A. A. Waggener*, **B. A. Bancroft**, and A. R. Blaustein. 2009. Influence of ultraviolet-B radiation on growth, prevalence of deformities, and susceptibility to predation in Cascades frog (*Rana cascadae*) larvae. *Hydrobiologia* 624(1): 219-233.

Blaustein, A. R. and **B.A. Bancroft**. 2009. Research on amphibian decline topics: Spotlight 6. *Northwest Naturalist* 90 (2): 74.

Bancroft, B. A., N. J. Baker* and A. R. Blaustein. 2008. A meta-analysis of the effects of ultraviolet B radiation and its synergistic interactions with pH, contaminants, and disease on amphibian survival. *Conservation Biology* 22(4): 987-996.

Bancroft, B. A., N. J. Baker*, C. L. Searle, T. S. Garcia and A. R. Blaustein. 2008. Larval amphibians seek warm temperatures and do not avoid harmful UVB radiation. *Behavioral Ecology* 19(4): 879-886.

Bancroft, B.A., N.J. Baker* and A. R. Blaustein. 2007. Effects of ultraviolet B radiation in marine and freshwater systems: a synthesis through meta-analyses. *Ecology Letters* 10(4): 332-345.

Blaustein, A.R. and **B.A. Bancroft**. 2007. Amphibian population declines: evolutionary considerations. *Bioscience* 57(5): 437-444.

Blaustein, A. R., B. Han, **B. Fasy**, et al. 2004. Variable breeding phenology affects the exposure of amphibian embryos to ultraviolet radiation and Optical characteristics of natural waters protect amphibians from UV-B in the U.S. Pacific Northwest: comment. *Ecology* 85 (6):1747-1754.

REPORTS

Shafer, S.L., J. Atkins, **B.A. Bancroft,** P.J. Bartlein, J.J. Lawler, B. Smith, and C.B.Wilsey. 2012. Projected climate and vegetation changes and potential biotic effects for Fort Benning, Georgia; Fort Hood, Texas; and Fort Irwin, California: U.S. Geological Survey Scientific Investigations Report 2011–5099, 46 p.

PRESS COVERAGE

Current Results: Key Discoveries About Our Environment "Ultraviolet-B Radiation Harms Aquatic Life" http://www.currentresults.com/Water/Water-Pollution/ultraviolet.php

RESEARCH POSITIONS

Postdoctoral Research Associate: *College of Forest Resources, U. of Washington* (2007-2010)
Studied the effects of multiple stressors on endangered/at risk species. Mentor: Joshua J. Lawler

Agricultural Research Technician II: *Intensive Forestry Laboratory, Washington State U.-Puyallup Research and Extension Center* (2000-2002)
Explored carbon sequestration in hybrid poplar plantations and mixed stands in semi-natural areas. Supervisor: Jon D. Johnson

Laboratory Assistant I: *Plant Pathology Laboratory, Washington State University-Puyallup Research and Extension Center* (2000)
Studied fungal pathogens of berry crops. Supervisor: Peter Bristow

GRANTS

M.J. Murdock Charitable Trust Natural Sciences Grant Program. Interactions among native and invasive aquatic species under future climate scenarios: does the community context matter? (2017-2020: $79,388)

M.J. Murdock Charitable Trust Partners in Science Program. Effects of climate change, invasive species, and nutrient input on aquatic community composition. (2017-2018: $15,000)

Gonzaga Summer Research Program (GSRP). Do predation and competition change in response to climate change in freshwater systems? (2016: $20,869)

iUTAH Catalyst Grant (NSF EPSCoR program). The effect of anthropogenic nitrogen and sedimentation on primary producers mediated through tadpole bioturbation (2013: $10,000)

Gibson Fellowship Program. Effects of co-occurring environmental stressors on larval amphibians (2013; $3,590)

Oregon State University, Zoology Research Funds: UVB radiation as an environmental stressor of amphibians (2003-2005; $2,100).

Sigma Xi Grants in Aid of Research: Effects of Ultraviolet-B Radiation on Melanin Production and Heat Shock Proteins in Amphibians (2004; $1,000).

GRADUATE MENTORING

Nick Baker, Oregon State University 2007-2010
Agricultural impacts on amphibian survival, growth, and distributions. Master's thesis.

Jorge Ramos, University of Washington, 2007-2010
Linking aquatic breeding amphibian distributions to multi-scale landscape patterns in the in the Puget Sound region. Master's thesis.

UNDERGRADUATE MENTORING (*denotes student who went on to graduate school, ⌘ denotes student who went on to professional school, § denotes underrepresented minority student)

Bailey Luoma and Rhenz Dan Illoreta§, Gonzaga University
Project: Aquatic species diversity at Deep Creek Preserve, Reardan, WA.

Julia Misslin, Ondraya Romero§, Karli McIntyre, and Paige Hauter, Gonzaga University
Project: Interactions among native and invasive aquatic species under future climate scenarios.

Bridget Eastwood, Gonzaga University
Project: Community-level physiological profiling of ponds at Deep Creek Preserve

Ondraya Romero§ and Karli McIntyre, Gonzaga University
Project: Effects of competition and climate change on survival of Pacific chorus frog tadpoles

Megan Lantsberger, Gonzaga University
Project: Effects of climate change on swimming speed of American bullfrog tadpoles and Brook stickleback fish

Ondraya Romero§, Nia Rivers§, and Kamrin Sorensen, Austen Rankin, Gonzaga University
Donald Long§ and Shawn Tatton, Southern Utah University
Project: Are the effects of multiple stressors consistent across aquatic ecosystems?

Erika Seirup§, Southern Utah University
Project: The effect of anthropogenic nitrogen and sedimentation on primary producers: Do tadpoles matter?

Claire Cleveland*, Southern Utah University
Project: Complexities of modern leaf morphology, climate proxies, and applicability in the fossil record.

Dillon Monroe*, Southern Utah University
Project: Urbanization and its effects on prey preference in wandering garter snakes (*Thamnophis elegans vagrans*).

Kandace Hugentobler* and Madison Clark, Southern Utah University
Project: Effects of diet on macronutrient preference in crayfish.

Veronica Garcia§ and Caitlin McLean, Southern Utah University
Project: Effects of feeding frequency on Cnidarian nematocyst production

Jared Wenn⌘ and Kevin Cannon*, Southern Utah University
Project: Effects of alcohol and nicotine on stress in tadpoles.

Jake Mecham*, Southern Utah University
Project: Age and growth of Channel Catfish.

Whitney Lee* and Rachel Wright, Southern Utah University
Project: Effects of thyroid hormone on tadpole growth and development.

David Dodds, Southern Utah University
Project: Tadpole assays for water quality in Coal Creek.

Amy Christoffersen Ehrhart*, Southern Utah University
Project: Effects of feeding frequency on Cnidarian nematocyst production

Kristin Beauchamp, Southern Utah University
Project: Effects of predator chemical cues on survival and behavior of salamander larvae

Katrina Slabaugh*, Southern Utah University
Project: Effects of hydroperiod on growth of salamander larvae

Nick Baker*, Oregon State University
Project: Meta-analyses and behavioral trials in amphibians

Karen Tonsfeldt*, Oregon State University
Project: Effects of hydroperiod on superoxide dismutase activity in *Rana cascadae*

Robin Sechrest⌘, Oregon State University
Project: Effects of UVB radiation on schooling behavior of *Rana cascadae* tadpoles

Tuyen Pham⌘, Oregon State University
Project: Effects of UVB radiation on schooling behavior of *Pseudacris regilla* tadpoles

INVITED PRESENTATIONS

Gonzaga University Senior Seminar (2015)
Title: Sun, Tanks, and Climate Change: Effects of Stress on Vertebrate Organisms

Southern Utah University Senior Seminar (2009)
Title: Ultraviolet Radiation as an Environmental Stressor of Amphibians

National Military Fish and Wildlife Association Annual Meeting, Climate Change Session (2008)
Title: Forecasting the relative and cumulative effects of multiple stressors on animal populations using a spatially-explicit individual-based model

University of Washington Wildlife Seminar Series (2007)
Title: Ultraviolet Radiation as an Environmental Stressor of Amphibians

Willamette University Seminar Series (2007)
Title: Hide, die, or deal with it: UVB radiation and amphibians

CONTRIBUTED PRESENTATIONS

Tatton, S.D.*, L.E. Petes, C.E.H. Kissman, D. Long Jr.*, and **B.A. Bancroft**. 2015 Stress across aquatic systems: A meta-analysis of synergistic interactions. *Ecological Society of America.*

Cleveland, C*.; J. Hargrave; R.M. Ogburn and **B.A. Bancroft**. 2014. Effect of competition on water-use traits and photosynthetic traits observed in leaf morphology during ancient plant diversity transitions. *Ecological Society of America*.

Seirup, E*.; K. Gillins*; B. Stevens*; V. Garcia*; T. Hildebrand; B. Baker and **B.A. Bancroft**. 2014. The effect of anthropogenic nitrogen and sedimentation on primary producers: Do tadpoles matter? *Ecological Society of America*.

Slabaugh, K.E.*; M. Clark* and **B.A. Bancroft**. 2012. The effects of temperature change and water fluctuation on growth in amphibian larvae. *Ecological Society of America*.

Garcia, V*.; A. Christoffersen*; C. McLean* and **B.A. Bancroft**. 2012. Comparing the production of nematocysts of starved and well-fed *Aiptasia pallida* anemones. *Ecological Society of America*.

Bancroft, B.A.; J.J. Lawler.; S.S. Shafer and N.H. Schumaker. 2009. Exploring the effects of climate change and disease on desert tortoises. *ESTCP-SERDP Annual Meeting*.

Bancroft, B.A.; C. B. Wilsey ǂ and J. J. Lawler. 2008. A multi-scale ensemble model of habitat suitability. *Ecological Society of America*.

Bancroft, B.A. 2007. Effects of UVB radiation and contaminants on amphibians. *Ecological Society of America*.

Bancroft, B.A. and A. R. Blaustein. 2007. Effect of UV-B radiation and skin color on survival and growth in larval amphibians. *Society for Integrative and Comparative Biology*.

Bancroft, B.A.; N.J. Baker* and A. R. Blaustein. 2006. Effects of ultraviolet B radiation in marine and freshwater systems: a synthesis through meta-analyses. *Society for Conservation Biology*.

Bancroft, B.A.; N.J. Baker* and A. R. Blaustein. 2006. Effects of ultraviolet B radiation in marine and freshwater systems: a synthesis through meta-analyses. *Western Society of Naturalists*.

Bancroft, B. A.; N.J. Baker*, T. S. Garcia, and A. R. Blaustein. 2005. Thermal preference and ultraviolet B radiation: microhabitat choice in amphibians. *Animal Behavior Society*.

Bancroft, B. A.; N.J. Baker*, T. S. Garcia, and A. R. Blaustein. 2004. Thermal preference and ultraviolet B radiation: microhabitat choice in amphibians. *Ecological Society of America*.

PROFESSIONAL DEVELOPMENT

Invited participant: Dissertation Initiative for the Advancement of Climate Change Research IV (DISCCRS). Symposium for recent PhD scientists working in climate change research. Saguaro Lake Ranch, Arizona (2008).

Invited participant: Ecological Dissertations in Aquatic Sciences VIII (Eco-DAS). Symposium for recent PhD scientists in aquatic science. University of Hawaii-Manoa (2008).

SOCIETY MEMBERSHIPS

Member of: Ecological Society of America