**JEFFREY DANIEL MUEHLBAUER**



Curriculum for the Environment & Ecology University of North Carolina at Chapel Hill

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# **Education**

Ph.D. Ecology *(In Progress)*. University of North Carolina at Chapel Hill (expected 2013)

M.S. Ecology. University of North Carolina- Chapel Hill (2010)

B.S. Biology & Chemistry. Northern Arizona University (2007)

Ecology Emphasis, with Honors, *Summa cum laude*, 4.0 GPA*.*

**Research & Employment**

University of North Carolina. Chapel Hill, NC. *Advisor: Dr. Martin W. Doyle*

* Ph.D. research on foodweb responses to floodplain morphology/hydrology and the presence of biological “stream signatures” in the terrestrial environment.
* M.S. thesis research focused on macroinvertebrate community, sediment, and hydrologic heterogeneity surrounding knickpoints in NC Piedmont as well as macroinvertebrate community responses to an experimental drought/rewetting at a wetland mitigation site on the NC Outer Coastal Plain.
* Spent one summer field season in Adirondacks measuring velocities and calculating shear stress during 4x-weekly recreational flood releases, identifying macroinvertebrate communities, and surveying river channels.
* Monitor (quarterly) macroinvertebrate community at a stream/wetland mitigation site from early restoration stages to present.
* Carried out suspended sediment monitoring above and below an urban stream restoration, from pre-restoration to 1-year post-restoration.
* Oversaw work and student research of multiple undergraduate field assistants.
* Facilitated laboratory setup, management, and safety.

Leibniz Institute of Freshwater Ecology & Inland Fisheries (IGB). Berlin, Germany. *Collaborators: Drs. Klement Tockner, Michael Monaghan, Martin Pusch*

* Visiting Researcher for 2 summers during dissertation research
* Gave presentations, collaborated with international river scientists

Northern Arizona University. Flagstaff, AZ. *Advisor:* *Dr. Jane C. Marks*

* Measured aquatic ecosystem effects of a diversion dam in Fossil Creek, AZ.
* Designed an independent research project studying ecological impacts of dam decommissioning.
* Analyzed leaf litter decomposition, invertebrate abundance, and fungal biomass using a Before-After Control-Impact (BACI) design.

Ecological Restoration Institute. Flagstaff, AZ. *Director: Dr. Peter Z. Fulé*

* Promoted to Assistant Crew Leader and supervised field research teams.
* Collected dendroecological and botanical field data during summer field seasons.
* Applied ecological, statistical, dendrochronological skills while working in a lab.

Duke University. Durham, NC. *Director: Dr. Christopher B. Newgard*

* Conducted biomedical/chemical research in an academic lab.
* Independently-researched enzymes affecting Diabetic β-cell function.

Boy Scouts of America Camp Raymond. Parks, AZ

* Led Boy Scout patrols through outdoor physically and mentally challenging, team-building activities.

Northland Youth Conservation Corps. Flagstaff, AZ

* Worked with a team of other Americorps volunteers in invasive weed removal and forest restoration thinning projects.

**Peer-Reviewed Scientific Publications**

7) Riggsbee, J.A., Doyle, M.W., Julian, J.P., Manners, R., Muehlbauer, J.D., Sholtes, J. & Small, M.J. (*Accepted*) Influence of aquatic and semi-aquatic organisms on channel forms and processes. In: *Treatise on Geomorphology* (Eds J. Schroder & E. Wohl). Vol. 9. Academic Press, San Diego.

6) Muehlbauer, J.D. & Doyle, M.W. (2012) Knickpoint effects on macroinvertebrates, sediment, and discharge in urban and forested streams: urbanization outweighs micro-scale heterogeneity. *Freshwater Science (formerly* *Journal of the North American Benthological Society)* 31:282-295*.* DOI: 10.1899/11-010.1

5) Muehlbauer, J.D., Duncan, J. M. & Doyle, M.W. (2011) Benign use of salt slugs on aquatic macroinvertebrates: Measuring discharge with salt during an aquatic ecology study. *River Research & Applications.* DOI: 10.1002/rra.1546

4) Muehlbauer, J.D., Doyle, M.W. & Bernhardt, E.S. (2011) Macroinvertebrate community responses to a dewatering disturbance gradient in a restored stream. *Hydrology and Earth System Sciences* 15:1771-1783. DOI: 10.5194/hess-15-1771-2011

3) Fuller, R.L., Griego, C., Muehlbauer, J.D., Dennison, J. & Doyle M.W. (2010) Response of stream macroinvertebrates in flow refugia and high-scour areas to a series of floods: A reciprocal replacement study. *Journal of the North American Benthological Society (now Freshwater Science)* 29:750–760. DOI: 10.1899/09-107.1

2) Muehlbauer J.D., LeRoy C.J., Lovett J.M., Flaccus K.K., Vlieg J.K. & Marks J.C. (2009) Short-term responses of decomposers to flow restoration in Fossil Creek, Arizona, USA. *Hydrobiologia* 618:35–45*.* DOI: 10.1007/s10750-008-9545-3

1) Joseph, J.W., Odegaard, M.L., Ronnebaum, S.M., Burgess, S.C., Muehlbauer, J., Sherry, A.D. & Newgard, C.B. (2007) Normal flux through ATP-citrate lyase or fatty acid synthase is not required for glucose-stimulated insulin secretion. *Journal of Biological Chemistry* 282:31592–31600. DOI: 10.1074/jbc.M706080200

**THESES**

1) Muehlbauer, J.D. (2010) Ecological heterogeneity in streams: geomorphic and hydrologic influences macroinvertebrate community structure. MS Thesis, University of North Carolina- Chapel Hill. 138 pp.

**OUTREACH & CREATIVE WRITING PUBLICATIONS**

3) Muehlbauer, J.D. (2007) Getting all wet at the ERI: a study of how riparian restoration influenced the aquatic ecosystem in Fossil Creek, Arizona. Ecological Restoration Institute Newsletter, Spring 2007. 3 pp. Available at http://www.eri.nau.edu.

2) Muehlbauer, J.D. (2004) Bridges, beer cans, and bulldozers: in search of answers along Abbey’s Road. *A Celebration of Ideas,* NAU Honors Publication Fall 2004:14 pp.

1) Muehlbauer, J.D. (2004) Superhumans: Raskolnikov, Meursault, Napoleon, and beyond. *A Celebration of Ideas,* NAU Honors Publication Spring 2004:10–12.

**CONFERENCE PRESENTATIONS (ORAL)**

10) Muehlbauer, J.D., Clay, P. & Doyle, M.W. (2012) Temporal succession and island biogeography in a braided river ecosystem following flash flooding: a bank-side community perspective. SFS Conference; Louisville.

9) Muehlbauer, J.D., Doyle, M.W & Tockner, K. (2011) Effects of river geomorphology on the spatial importance of aquatic energy flows into terrestrial food webs. AGU Conference; San Francisco.

8) Muehlbauer, J.D., Tockner, K. & Doyle, M.W. (2011) “Stream signatures:” aquatic subsidy importance to terrestrial foodwebs with distance from the stream. NABS Conference; Providence.

7) Muehlbauer, J.D. & Doyle, M.W. (2010) Does urbanization overcome micro-scale heterogeneity? Knickpoint effects on macroinvertebrates, sediment, and discharge in urban and forested streams. NABS/ASLO Conference; Santa Fe.

6) Muehlbauer, J.D., Bernhardt, E.S. & Doyle, M.W. (2009) Macroinvertebrate community responses to an experimental drought gradient on the outer coastal plain of North Carolina. NABS Conference; Grand Rapids.

5) Fuller, R., Griego, C., Dennison, J., Muehlbauer, J.D. & Doyle, M.W. (2009) Response of stream macroinvertebrates in flow refugia and high scour areas to a series of floods: A reciprocal replacement study. NABS Conference; Grand Rapids.

4) Muehlbauer, J.D. & Doyle, M.W. (2008) Knickpoint effects on habitat and the macroinvertebrate community. SE Stream Restoration Conference; Asheville.

3) Muehlbauer, J.D., *et al.* (2007) Short-term effects of dam decommissioning and flow restoration in Fossil Creek. ESA/SER Conference; San Jose.

2) Muehlbauer, J.D. (2004) Bridges, Beer Cans, and Bulldozers: In Search of Answers along Abbey’s Road. NAU Fall Honors Symposium; Flagstaff.

1) Muehlbauer, J.D. (2004) Superhumans: Raskolnikov, Meursault, Napoleon, and Beyond. NAU Spring Honors Symposium; Flagstaff

**Conference Presentations (Poster)**

5) Seiter, S., Jobe, R.T., Anton, A., Bidgood, E.P., Breckheimer, I., Caplow, S.C., Evans, B., Faestel, M., Muehlbauer, J.D., Palmquist, K., Seymour, S.D., Tessel, S.M., & Moody, A. (2009) The Great Smoky Mountains All-Taxa Biological Inventory: lessons for sampling design, management, and citizen science. ESA Conference; Albuquerque.

4) Muehlbauer, J.D., LeRoy, C.J., Lovett, J.M., Vlieg, J.K., Flaccus, K.K. & Marks, J.C. (2007) Short-term effects of diversion dam decommissioning and flow restoration on decomposition, fungal biomass, and the macroinvertebrate community in Fossil Creek, AZ, USA. Undergraduate Research and Design Day; NAU, Flagstaff.

1–3) Muehlbauer, J.D., Lovett., J.M., LeRoy, C.J., Vlieg, J.K., Flaccus, K.K., Bennett, S.E., Delaney, I.A., Jones, K.L., Norman, P.A., Patrick, M.M., Plichta, J.R. & Marks, J.C. (2005) Diversion Dam Reduces Decomposition, Fungal Biomass and Macroinvertebrate Abundance and Diversity. NABS/AGU Conference; New Orleans, NAU Undergraduate Research & Design Day; Flagstaff, NAU Undergraduate Showcase; Flagstaff.

**INVITED, NON-CONFERENCE PRESENTATIONS**

2) “Water, watersheds & people”, UNC special course on water issues, February 2010

1) “Carbon dioxide” (for 200 children), Chapel Hill/Carrboro City Schools, Sept. 2009

**TEACHING**

ENST 698: Cistern Water Quality Capstone Course. UNC, Chapel Hill, NC 1/2011–5/2011

* Provided guidance for 9-student undergraduate team in water quality sampling
* Facilitated data collection, analysis, and reporting
* Served as Graduate Research Consultant

GEOG 442: River Processes. UNC, Chapel Hill, NC 8/2010–12/2010

* Graduate/upper undergraduate class in fluvial geomorphology
* Lectured occasionally, prepared and graded assignments as Teaching Assistant.

GEOG 110: Introduction to Environmental Systems. UNC, Chapel Hill, NC 8/2008–12/2008, 1/2011–5/2011.

* Freshman-level lecture class in geography, ~150 students
* Lectured occasionally, graded, and held office hours as Teaching Assistant.

ENST 201: Environment & Society. UNC, Chapel Hill, NC 8/2009–12/2009.

* Course for underclassmen on (inter)national environmental issues and policies
* Taught 3 recitation sections ~60 students; lectured, graded, led discussions.

ECOL 569: Current Issues in Ecology. UNC, Chapel Hill, NC 1/2009–5/2009.

* First-year Ecology graduate core class on researching and publishing a paper
* Led discussions, graded, provided writing assistance as Teaching Assistant.

HON 399: Beyond the Bachelors. NAU, Flagstaff, AZ 1/2006–5/2007.

* Honors class for students considering graduate school
* Assisted with course creation process: Syllabus/schedule planning
* Designed, supervised, and maintained online (Blackboard) class component
* Served as Teaching Assistant.

**Awards & Recognitions**

ASLO Student Travel Award, 5/2012. $500

* For travel to the ASLO Conference in Otsu, Japan (Declined).

IGB Fellowship in Freshwater Science, 6/2011. ~$6,000

* Summer salary support to visit IGB in 2011 for dissertation research

Sigma Xi Grant in Aid of Research, 4/2010. $800

* To develop a method for studying aquatic-terrestrial foodweb subsidies.

CUAHSI Pathfinder Fellowship, 3/2010. $5,000

* To support multi-site research in Hydrology.

Cary IES Ecosystem Ecology Course, 1/2010.

* Accepted to and participated in winter short course offered by IES staff.

Binghamton Symposium Student Travel Award, 10/2009. $75

* For travel to the Binghamton Geomorphology Conference in Blacksburg, VA.

NABS President’s Award, 5/2009. $900

* Endowment award for MS research proposal for an experimental drought study.

Graduate Professional Student Federation Travel Award, UNC, 4/2009. $400 (Declined)

* Applied for grant to attend 2009 NABS meeting (declined due to other funding)

Pogue Fellow, UNC, 8/2007–Present. Officially ~$200,000

* Five-year fellowship tuition/assistantship within the University Fellows program.

Gold Axe Award, NAU, 4/2007

* University-wide award given to seniors who have exhibited strong scholastic achievement and extracurricular/community involvement while at NAU.

Bayless Biology Scholarship, NAU, 4/2007. $250

* + Biology departmental scholarship awarded for completing a significant research project that is in preparation for publication in a peer-reviewed journal and presentation at a national conference.

Senior Scholastic Award, NAU, 4/2007. $250

* + Biology Departmental award given to senior student with the highest GPA.

Senior Scholar Award, NAU, 4/2007. $250

* + - Chemistry departmental award given to a senior student with strong scholastic achievement who has made a significant contribution to the Chemistry Department.

Raymond Scoutmaster Scholarship, NAU, 4/2006. $500

* + - University-wide scholarship given to an NAU student who is active with the Boy Scouts of America.

Kirk Smith Scholarship, NAU, 4/2005. $500

* + - Awarded by the Ecological Restoration Institute to outstanding Undergraduate Research Assistants.

Provost’s Scholarship, NAU, 8/2003–5/2007. Officially ~$50,000

* + - Four-year scholarship awarded to NAU students who graduated in the top two percent of their high school classes.

Exchange Club Chapter and Regional Scholarships, 5/2003 and 7/2003. $3,000 total

* + - Scholarship given to the winner of chapter and region-wide essay competition on American patriotism.

First place in Aquatics section, Canon International Envirothon, Frederick, MD, 7/2003

* + - * Served as captain of five-person team; competition involved field and written tests.

State Champions, Arizona Envirothon, Casa Grande, AZ, 4/2003

* Won all-around competition and individual competitions in aquatics, forestry, soils, wildlife, and agriculture involving field, written, and oral tests

Eagle Scout, Boy Scout Troop 7031, Flagstaff, AZ, 10/2001

* For final service project put up signs in national forest describing restoration efforts

**PROFESSIONAL SERVICE & SYNERGISTIC ACTIVITIES**

Graduate Student President. UNC Curriculum for the Environment & Ecology, 2012–Present

* + Represented Curriculum graduate students in matters of Curriculum administration.

Undergraduate Awards Committee. Society for Freshwater Science, 2012–Present

* + Solicited, reviewed, and awarded funds for undergraduates to attend annual conference.

Undergraduate “Instars” Program Mentor. Society for Freshwater Science, 2012

* + Mentored undergraduates from underrepresented groups at annual conference.

Seminar Search Committee. UNC Curriculum for the Environment & Ecology

Chair 2011–2012; Member 2008–2009, 2010–2011

* Invited, coordinated, and hosted speakers for weekly seminar program.

Faculty Search Committee. UNC Curriculum for the Environment & Ecology, 2011–2012

* + Graduate student representative in search committee for environmental faculty.

Graduate Research Consultant. UNC Cistern Water Quality Capstone, 2011

* + Provided research design, lab, field, and writing assistance to undergraduate capstone class.

Aquatic ecology expert. Durham Museum of Life & Science, 2012

* + Advised staff on development of an aquatic ecology educational curriculum.

“Water Bug Expert” Volunteer. North Carolina Division of Water Quality, 2010–Present.

* + Gave hands-on presentations at NC Museum of Natural Science “BugFest” and NC State Fair.

Virtual Science Fair Mentor. Ravenscroft School, 2011–2012

* + Provided scientific advice and project reviews for high school online science fair.

“Expert Scientist” Guest. Chapel Hill/Carrboro City Schools, 2009–2010

* Gave lectures and demonstrations on science to school children.

Author English Help Volunteer. Ecological Society of America, 2006–Present

* Assisted international ecologists with improving the English grammar and fluidity of their manuscripts prior to submission for peer-review.

Peer-reviewer. Ecology, Canadian Journal of Fisheries & Aquatic Sciences, Limnology & Oceanography: Fluids & Environments, River Research & Applications, Restoration Ecology, Journal of the American Water Resources Association, Water Resources Research (1 each)

Science Volunteer at public events. NC Museum of Natural Sciences, NC Department of Water Quality, 2010–present

* Gave invertebrate, fish, and water quality demonstrations for the public

Chapter President & VP. Student Affiliates of the American Chemical Society, 2004–2007

* Organized meetings and recruitment, planned service activities and professional development opportunities, 2003–2007

Assistant Scoutmaster. Boy Scouts of America Troop 7031, 2003–2007

* Mentored and instructed scouts in outdoor skills and character building.

Coordinator. Sierra Student Coalition (SSC), 2002–2007

* Directed students in environmental lobbying events and adventure outings.

Organizer. Society of Environmental Communicators (SEC), 2005–2007

* Facilitated planning and coordination of campus-wide Earth Day celebration.

Coach. Sinagua High School Envirothon team, 2006–2007

* Trained students in aquatic ecology, forestry, and climate change issues.

Volunteer. The Nature Conservancy, 2002–2005

* Assisted with service and ecological projects at Hart Prairie Nature Preserve.

**PROFESSIONAL AFFILIATIONS**

European Geosciences Union (EGU), 2011–Present

Sigma Xi, 2010–Present

American Society of Limnology and Oceanography (ASLO), 2009–Present

Society for Freshwater Science (SFS, formerly NABS), 2008–Present

American Geophysical Union (AGU), 2007–Present

Ecological Society of America (ESA), 2005–Present

Society for Ecological Restoration International (SER), 2005–Present

Honor Society of Phi Kappa Phi, 2005–Present

Student Affiliates of the American Chemical Society (SAACS) 2003–2007