JEFFREY DANIEL MUEHLBAUER

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EXPERTISE

Stream Ecology. Stream and riparian community ecology, large river ecosystems, aquatic and riparian macroinvertebrates, food webs, multivariate statistics and ordination, stable isotope analysis, aquatic biogeochemistry, leaf decomposition.

Hydrology & Geomorphology. Geomorphic surveys, in-stream hydraulics, sediment transport (incipient motion analysis), modeling (HEC-RAS).

Restoration & Urbanization. Stream and wetland compensatory mitigation, dam removal, ecological monitoring, effects of urbanization and restoration on aquatic ecosystems.

Research Logistics. Design and implementation of multi-year, international and domestic research in both remote and densely-populated regions, small and large-group mentoring and leadership, oversight of simultaneous projects, lab management.

Large River Fieldwork. Initiated, organized, led multi-year studies in large river ecosystems:

- Colorado River Basin: Colorado, Green, San Juan, Little Colorado, & Gunnison Rivers, western US (5^{th}–8^{th} Order, heavily regulated, endangered species), 2013–Pres.
- Danube River Basin: Danube, Sava, & Drava Rivers, central Europe (7^{th}–10^{th} Order, ship traffic, groin fields, industrial forestry & fisheries, confluences), 2010–2011
- Tagliamento River, Italy (1^{st}–7^{th} Order, braided, alpine, un-dammed), 2010–2011
- Elbe River, Germany (8^{th} Order, groin fields, cruise ship traffic), 2011
- Coweeta LTER & Little Tennessee River, NC (1^{st}–6^{th} Order, natural), 2009–2010
- Hudson & Indian Rivers, NY (5^{th} Order, dam flood pulses), 2007
- Timberlake stream/wetland, NC (drought, restoration monitoring), 2007–2012
- Meeting of the Waters & New Hope Creeks, NC (3^{rd} Order, urbanizing), 2008

FOSSIL CREEK, AZ (KARST SPRING, DAM REMOVAL), 2003–2007EDUCATION

Ph.D. Ecology. University of North Carolina at Chapel Hill, 2013

- Thesis: "Stream signatures" and aquatic-terrestrial interactions in arthropod food webs

M.S. Ecology. University of North Carolina at Chapel Hill, 2010

- Thesis: Ecological heterogeneity in streams: geomorphic and hydrologic influences on macroinvertebrate community structure

B.S. Biology & Chemistry. Northern Arizona University, 2007
Ecology Emphasis, with Honors, *Summa cum laude.* 4.0 GPA.

- Thesis: Short-term effects of dam decommissioning and flow restoration

RESEARCH & EMPLOYMENT

US Geological Survey, Grand Canyon Monitoring and Research Center and Southwest Biological Science Center. Flagstaff, AZ. Supervisor: Dr. Theodore A. Kennedy

- Research Biologist, 2013–Pres.
- Postdoctoral Fellow, Research Ecologist, 2013–2017.

US Geological Survey Grand Canyon Monitoring and Research Center. Flagstaff, AZ. Supervisors: Dr. Theodore A. Kennedy and Dr. Charles B. Yackulic

- Postdoctoral Fellow, 2013–2017.

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

- University Fellow, 2007–2012; Geography/Ecology TA/RA, 2008–2012.

RESEARCH & EMPLOYMENT (CONTINUED)

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

- Visiting Fellow, 2011; Tagliamento River research station, 2010–2011

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

- Research Associate, Department of Biology, 2003–2007

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

- Assistant Crew Leader, 2006; Research Assistant, 2004–2007

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

- Chemist/Geneticist Intern, 2005

Boy Scouts of America Camp Raymond. Parks, AZ.

- Ropes Course Instructor, 2003

Northland Youth Conservation Corps. Flagstaff, AZ.

- Americorps Team Member, 2002

SCIENTIFIC PUBLICATIONS

Asterisks (*) indicate mentored student or technician

19) Muehlbauer, J.D., Kennedy, T.A., *Copp, A.J. & Sabol, T.A. (In Press) Deleterious effects of net clogging on the quantification of stream drift. *Canadian Journal of Fisheries and Aquatic Sciences* DOI: 10.1139/cjfas-2016-0365

18) Baxter, C.V., Kennedy, T.A., Miller, S.W., Muehlbauer, J.D. & Smock, L.A. (2017) Macroinvertebrate drift, adult insect emergence and oviposition. In: *Methods in Steam Ecology* (Eds F.R. Hauer & G.A. Lamberti), 3rd edition, Vol. 1, *Ecosystem Structure*, pp 435–456. Academic Press, Boston, MA. DOI: 10.1016/B978-0-12-416558-8.00021-4

17) Dzul, M.C., Yackulic, C.B., Korman, J., Yard, M.D. & Muehlbauer, J.D. (2017) Incorporating temporal heterogeneity in environmental conditions into a somatic growth model. *Canadian Journal of Fisheries and Aquatic Sciences* 74: 316–326. DOI: 10.1139/cjfas-2016-0056

16) *Metcalfe, A.N., Kennedy, T.A. & Muehlbauer, J.D. (2016) Phenology of the adult angel lichen moth (*Cisthene angelus*) in Grand Canyon, USA. *The Southwestern Naturalist* 61: 233–240. DOI: 10.1894/0038-4909-61.3.233

15) *Smith, J.T., Muehlbauer, J.D. & Kennedy, T.A. (2016) Evaluating potential sources of variation in Chironomidae catch rates on sticky traps. *Marine and Freshwater Research*. 67: 1987–1990. DOI: 10.1071/MF15189

14) Kennedy, T.A., Muehlbauer, J.D., Yackulic, C.B., Lytle, D.A., Miller, S.W., Dibble, K.L., *Kortenhoeven, E.W., *Metcalfe, A.N. & Baxter, C.V. (2016) Flow management for hydropower extirpates aquatic insects, undermining river food webs. *BioScience*. 77: 561–575. DOI: 10.1093/biosci/biw059 ***BioScience Editor's Choice and featured in Press Releases by USGS, Oregon State U., Conservation Magazine, and others.***

13) Larsen, S., Muehlbauer, J.D. & Martí, E. (2016) Resource subsidies between stream and terrestrial ecosystems under global change. *Global Change Biology* 22: 2489–2504. DOI: 10.1111/gcb.13182

12) *Clay, P.A., Muehlbauer, J.D. & Doyle, M.W. (2015) Effect of tributary and braided confluences on aquatic macroinvertebrate communities and geomorphology in an alpine river watershed. *Freshwater Science* 34: 845–856. DOI: 10.1086/682329

11) *Smith, J.T., Kennedy, T.A. & Muehlbauer, J.D. (2014) Building a better sticky trap: description of an easy to use trap and pole mount for quantifying the abundance of adult aquatic insects. *Freshwater Science* 33: 972–977. DOI: 10.1086/676998

10) *Copp, A., Kennedy, T.A. & Muehlbauer, J.D. (2014) Barcodes are a useful tool for labeling and tracking ecological samples. *Bulletin of the Ecological Society of America* 95: 293–300. DOI: 10.1890/0012-9623-95.3.293

SCIENTIFIC PUBLICATIONS (CONTINUED)

9) Muehlbauer, J.D., Collins, S.F., Doyle, M.W. & Tockner, K. (2014) How wide is a stream? The spatial extent of the potential "stream signature" in terrestrial food webs using meta-analysis. *Ecology* 95: 44-55. DOI: 10.1890/12-1628.1 ***Article recommended by Faculty of 1000Prime, and featured on SFS podcast "Making Waves."***

8) Wang, H., Zhang, Z., Muehlbauer, J.D., He, Q. & Jiang, D. (2014) Linking stoichiometric homeostasis of microorganisms with soil phosphorous dynamics in wetlands subjected to microcosm warming. *PLoS ONE* 9: e85575. DOI: 10.1371/journal.pone.0085575

7) Riggsbee, J.A., Doyle, M.W., Julian, J.P., Manners, R., Muehlbauer, J.D., Sholtes, J. & Small, M.J. (2013) Influence of aquatic and semi-aquatic organisms on channel forms and processes. Pages 189-202 in: *Treatise on Geomorphology* (Ed J.F. Schroder), Vol. 9, *Fluvial Geomorphology* (Ed E. Wohl), pp 189-202. Academic Press, San Diego. DOI: 10.1016/B978-0-12-374739-6.00237-2

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* 31: 282-295. DOI: 10.1899/11-010.1

5) Muehlbauer, J.D., Duncan, J. M. & Doyle, M.W. (2012) Benign use of salt slugs on aquatic macroinvertebrates: Measuring discharge with salt during an aquatic ecology study. *River Research & Applications* 28: 1858-1863. 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

MANUSCRIPTS IN REVIEW

20) Muehlbauer, J.D., *Clay, P.A., Doyle, M.W. & Tockner, K. (In Revision) Landscape controls on stream signatures: the forest edge as the stream boundary for terrestrial food webs. *For Ecological Monographs*

MANUSCRIPTS IN PREP

21) Muehlbauer, J.D. & Doyle, M.W. (In Prep) Flooding decouples a major aquatic-terrestrial subsidy: insights from the combination of multiple ecological theories. *For Oikos (~95%, revising draft)*

22) Muehlbauer, J.D. (In Prep) A critical examination of the variables affecting stream subsidy dynamics. *For Aquatic Sciences. (~90%, revising draft)*

23) Muehlbauer, J.D. & Doyle, M.W. (In Prep) Does monitoring length affect restoration success? A 5-year stream/wetland study. *For Restoration Ecology. (~80%, writing)*

24) Muehlbauer, J.D., Yackulic, C.B., Kennedy, T.A. & Wright, S.A. (In Prep) Lagrangian sampling reveals strong linkage between invertebrate drift and shear stress in a large river dam tailwater. *For Freshwater Biology. (~50%, analyzing data)*

MANUSCRIPTS IN PREP (CONTINUED)

25-26) Muehlbauer, J.D. & Kennedy, T.A. (In Prep) Local and regional geomorphic controls on insect emergence throughout the Colorado River watershed in Grand Canyon. *(~20%, processing data. 2+ publications)*

27-28) Muehlbauer, J.D., Kennedy, T.A. & Yackulic, C.B. (In Prep) Food web ecology of the Little Colorado River and implications for spawning populations of endangered humpback chub *(~10%, work ongoing. 2+ publications)*

THESES

2) Muehlbauer, J.D. (2013) "Stream signatures" and aquatic-terrestrial interactions in arthropod food webs. Ph.D. Thesis, University of North Carolina at Chapel Hill. 279 pp.

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

OUTREACH & CREATIVE WRITING PUBLICATIONS

4) *Kortenhoeven, E.W., Muehlbauer, J.D. & Kennedy, T.A. (2016) Hydropower waves, insect eggs and citizen science: what's up with the aquatic food base in Grand Canyon? *Boatman's Quarterly Review*, Fall 2016: 5 pp.

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.

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.

DATA PUBLICATIONS

4) Muehlbauer, J.D., Kennedy, T.A., *Copp, A.J. & Sabol, T.A. (2017) Stream drift sampling in Arizona, 2014—Data. *US Geological Survey Data Release*. DOI: 10.5066/F71J97WD

3) *Metcalfe, A.N., Kennedy, T.A. & Muehlbauer, J.D. (2016) Angel lichen moth abundance and morphology data, Grand Canyon, AZ, 2012. *US Geological Survey Data Release*. DOI: 10.5066/F7154F5S

2) Kennedy, T.A. & Muehlbauer, J.D. (2016) Flow management for hydropower extirpates aquatic insects, undermining river food webs—Data. *US Geological Survey Data Release*. DOI: 10.5066/F7WM1BH4

1) Muehlbauer, J.D. (2014) How wide is a stream? Spatial extent of the potential "stream signature" in terrestrial food webs using meta-analysis—Data. Ecological Archives E095-006.

CONFERENCE PRESENTATIONS

62) Muehlbauer, J.D., Quigley, T.J. & Kennedy, T.A. (2017) Can we relate terrestrial-aquatic linkages to hydropower flows downstream of a large dam? (Invited talk). SFS.

61) Deemer, B.R., Yackulic, C.B., Hall, R.O., Kennedy, T.A. Muehlbauer, J.D. (2017) Phosphorous releases from a large dam are a lever on primary production and higher trophic levels up to 120 kilometers downstream. SFS.

60) Metcalfe, A.N., Kennedy, T.A., Muehlbauer, J.D. & Marks, J.C. (2017) The Colorado River Basin: aquatic insect diversity and distribution in a fragmented riverscape. SFS

59) Abernethy, E.F., Kennedy, T.A., Muehlbauer, J.D., Van Driesche, R.P. & Lytle, D.A. (2017) Aquatic invertebrate community structure downstream of hydropeaking dams in the Colorado River Basin (Poster). SFS.

CONFERENCE PRESENTATIONS (CONTINUED)

58) Daubert, M.E., Muehlbauer, J.D., Kennedy, T.A. & Healy, B.D. (2017) Aquatic invertebrate response to trout removal in Bright Angel Creek, Grand Canyon, AZ (Poster). SFS.

57) Lupoli, C.A., Sabo, J.L., Kennedy, T.A., Muehlbauer, J.D. & Yackulic, C.B. (2017) Terrestrial-aquatic linkages in the Grand Canyon (Poster). SFS.

56) Muehlbauer, J.D. (2017) Brown trout in Glen Canyon: insights from an expert elicitation survey. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

55) Muehlbauer, J.D. (2017) Fluvial aquatic ecology of the Colorado River. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

54) Kennedy, T.A., Dodrill, M.J., Yackulic, C.B. & Muehlbauer, J.D. (2017) Floods, flows, and the aquatic foodbase. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

53) Daubert, M.E., Ingram, A.E., Muehlbauer, J.D. & Kennedy, T.A. (2017) Aquatic invertebrate response to brown trout removal in Bright Angel Creek: study design and preliminary results (Poster). Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

52) Lupoli, C.A., Kennedy, T.A., Muehlbauer, J.D. & Yackulic, C.B. (2017) Terrestrial-aquatic linkage sin the Grand Canyon (Poster). Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

51) Deemer, B.R., Yackulic, C.B., Hall, R.O., Kennedy, T.A. & Muehlbauer, J.D. (2017) Lake Powell nutrient dynamics are a lever on food webs near the LCR (Poster). Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

50) Muehlbauer, J.D. & Bair, L. (2016) Brown trout expert elicitation survey results. Grand Canyon Fish Cooperators Meeting.

49) Muehlbauer, J.D., Kortenhoeven, E.K., Kennedy, T.A. & Yackulic, C.B. (2016) Little Colorado River foodbase research: 3 years on. Grand Canyon Fish Cooperators Meeting.

48) Muehlbauer, J.D. (2016) Aquatic foodbase of the Little Colorado River. Glen Canyon Dam Adaptive Management Working Group Meeting.

47) Muehlbauer, J.D. & Kennedy, T.A. (2016) Dammed and adrift: patterns of invertebrate drift throughout Colorado River Basin tailwaters. SFS.

46) Kennedy, T.A., Muehlbauer, J.D., Yackulic, C.B., Lytle, D.A., Miller, S.W., Dibble, K.L., Kortenhoeven, E.W. & Metcalfe, A.N. (2016) Flow management for hydropower extirpates aquatic insects, the foundation of river food webs. SFS.

45) Abernethy, E.F., Kennedy, T.A., Muehlbauer, J.D., Van Driesche, R.P. & Lytle, D.A. (2016) Benthic aquatic invertebrate community composition and species abundance downstream of Fontenelle Dam. SFS.

44) Evans, M.J., Kennedy, T.A. & Muehlbauer, J.D. (2016) Variability in blackfly, midge, and caddisfly resource utilization downstream of a large dam. SFS.

43) Muehlbauer, J.D., Kennedy, T.A. & Kortenhoeven, E.W (2016) Food availability in the Little Colorado River over space and time. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

42) Kennedy, T.A., Muehlbauer, J.D., Yackulic, C.B., Lytle, D.A. & Miller, S.W. (2016) A life history bottleneck for aquatic insects arising from hydropeaking. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

41) Muehlbauer, J.D., Kennedy, T.A. & Kortenhoeven, E.K. (2015) Little Colorado River foodbase update. Grand Canyon Fish Cooperators Meeting.

40) Kennedy, T.A., Muehlbauer, J.D., Lytle, D.A. & Yackulic, C.B. (2015) Mainstem foodbase update. Grand Canyon Fish Cooperators Meeting.

CONFERENCE PRESENTATIONS (CONTINUED)

39) Muehlbauer, J.D., Kennedy, T.A., Kortenhoeven, E.W. & Smith, J.T. (2015) Longitudinal and temporal patterns of food availability for endangered humpback chub, *Gila cypha*, in the Little Colorado River, Arizona. Desert Fishes Council.

38) Kortenhoeven, E.W., Muehlbauer, J.D., Kennedy, T.A. & Metcalfe, A.N. (2015) Spatial and temporal patterns of emergent aquatic insects of the San Juan River in Utah, USA from Bluff to Clay Hills. Desert Fishes Council.

37) Muehlbauer, J.D., Kennedy, T.A., Kortenhoeven, E.W. & Smith, J.T. (2015) There's more than one way to shade a river: contrasting influence of canyon orientation and water clarity on aquatic invertebrate densities. ESA.

34–36) Kennedy, T.A., Muehlbauer, J.D., Lytle, D.A., Yackulic, C.B., Kortenhoeven, E.W. & Metcalfe, A.N. (2015) Little bugs, big data, and Grand Canyon: light trapping by river rafters yields insights into Colorado River aquatic insect dynamics. International Society for River Science; Biennial Conference of Science & Management on the Colorado Plateau; Desert Fishes Council.

33) Kennedy, T.A., Muehlbauer, J.D., Dodrill, M.J., Copp, A.C. & Yard, M.D. (2015) Big flood, small flood, spring flood, fall flood: how controlled flood timing affects food web response in the Glen Canyon Dam tailwater. SFS.

32) Schroer, M., Miller, S., Courtwright, J., Muehlbauer, J. & Kennedy, T. (2015) Oviposition habitat selectivity of tailwater macroinvertebrates: a methodological approach from the Colorado River Basin (Poster). SFS.

31) Muehlbauer, J.D., Kennedy, T.A., Kortenhoeven, E.W. & Smith, J.T. (2015) Aquatic insect densities throughout the LCR: preliminary results (Poster). Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

30) Kennedy, T.A., Dodrill, M.J., Copp, A.J. & Muehlbauer, J.D. (2014) Invertebrate drift in Glen Canyon, 2007-2013. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

29) Muehlbauer, J.D., Kennedy, T.A., *Smith, J.T., Sankey, J.B. & Kortenhoeven, E.W. (2014) Advances in emergent insect sampling: new sticky trap designs and automated sample processing. Joint Aquatic Sciences Meeting.

28) Kennedy, T.A., Muehlbauer, J.D., Yackulic, C.B., Kortenhoeven, E.W. & Metcalfe, A.N. (2014) Flow management is a primary control on insect emergence in the Colorado River in Grand Canyon. Joint Aquatic Sciences Meeting.

27) *Smith, J.T., Muehlbauer, J.D. & Kennedy, T.A. (2014) Determining the effects of insect pheromone release on sticky trap catch rates (Poster). Joint Aquatic Sciences Meeting.

26) Copp, A.J., Kennedy, T.A. & Muehlbauer, J.D. (2014) Don't get clogged up: using net filtration efficiencies to inform deployment length in drift studies (Poster). Joint Aquatic Sciences Meeting.

25) Kennedy, T.A., Muehlbauer, J.D., Dibble, K.L. & Yackulic, C.B. (2014) Dude, where's my foodbase? (Poster) Glen Canyon Dam Adaptive Management Program Federal Meeting.

24) Kennedy, T.A., Muehlbauer, J.D. & Yackulic, C.B. (2014) Foodweb update. Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

23) Muehlbauer, J.D., Kennedy, T.A. & Yackulic, C.B. (2014) Shear stress and benthic densities control spatial variation in invertebrate drift concentrations throughout Glen Canyon. Grand Canyon Biological Cooperators Meeting.

22) Muehlbauer, J.D., Kennedy, T.A. & Yackulic, C.B. (2013) Shear stress drives local variation in invertebrate drift in a large river. AGU.

CONFERENCE PRESENTATIONS (CONTINUED)

21) Kennedy, T.A., Yackulic, C.B., Muehlbauer, J.D., Kortenhoeven, E. & Copp, A.J. (2013) High resolution sampling of insect emergence by citizen scientists leads to fundamental insights about the life history of aquatic insects in the Colorado River, Grand Canyon. Biennial Conference of Science & Management on the Colorado Plateau.

19–20) *Smith, J.T., Kennedy, T.A. & Muehlbauer, J.D. (2013, 2014) Building a better bug trap: Petri dishes as a low cost and easy to use sticky trap (Poster). Biennial Conference of Science & Management on the Colorado Plateau; Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

17–18) Copp, A.J., Kennedy, T.A. & Muehlbauer, J.D. (2013, 2014) Learning from retailers: barcoding is a useful tool for labeling and tracking samples in field and lab settings (Poster). Biennial Conference of Science & Management on the Colorado Plateau; Glen Canyon Dam Adaptive Management Program Annual Reporting Meeting.

16) Muehlbauer, J.D. (2013) How long is "long enough" in ecological restoration monitoring? UNC Curriculum for the Environment & Ecology Student Research Symposium.

15) 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.

14) 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.

13) Muehlbauer, J.D., Tockner, K. & Doyle, M.W. (2011) "Stream signatures:" aquatic subsidy importance to terrestrial food webs with distance from the stream. NABS.

12) 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. ASLO/NABS.

11) 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.

10) 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.

9) 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.

8) Muehlbauer, J.D. & Doyle, M.W. (2008) Knickpoint effects on habitat and the macroinvertebrate community. Stream Restoration in the Southeast Conference.

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

6) 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 (Poster). NAU Undergraduate Research and Design Day.

3–5) Muehlbauer, J.D., *et al.* (2005) Diversion dam reduces decomposition, fungal biomass and macroinvertebrate abundance and diversity (Poster). AGU/NABS, NAU Undergraduate Research & Design Day; NAU Undergraduate Showcase.

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

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

INVITED, NON-CONFERENCE PRESENTATIONS

6) "Dammed and adrift in the Colorado River Basin". USGS Southwest Biological Science Center All-Hands Meeting, 2017

5) "Beyond the meter tape: defining ecological boundaries using food web metrics." ASU Polytechnic Global Institute of Sustainability Seminar, 2015

4) "'Stream signatures' and aquatic-terrestrial interactions in arthropod food webs." USGS Southwest Biological Science Center Brown Bag Seminar, 2013

3) "'How big is a river? How far do bugs fly? Hold on, you do what?' And other questions preschoolers (and parents) ask." UNC Royster Society of Fellows Interdisciplinary Seminar, 2012

2) "Water, watersheds & people." UNC special course on water issues, 2010

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

GRANTS & RECOGNITIONS

~$2,150,000 total in grant and fellowship support

Federal Agencies

- Bureau of Reclamation Glen Canyon Dam Adaptive Management Program 3-year workplan for aquatic foodbase research in Colorado River, 2015–2017 (*$1,147,700*)
- Western Area Power Administration grant for aquatic foodbase research in Colorado River Basin, 2015–2017 (*$395,000*)
- USGS Pathways Program support for undergraduate interns, 2014–2017 (*$42,000*)
- NSF-USGS Graduate Research Improvement Program support, 2017
- USGS Southwest Biological Science Center Discretionary Funding, 2013 (*$5,000*)

Societies & Organizations

- Association for the Sciences of Limnology & Oceanography Travel Award, 2012 (*$500*)
- IGB (Berlin) Fellowship in Freshwater Science, 2011 (*~$6000*)
- CUAHSI Hydrology Pathfinder Fellowship, 2010 (*$5000*)
- Sigma Xi Grant in Aid of Research (GiAR), 2010 (*$800*)
- Cary IES Ecosystem Ecology Course, 2010
- North American Benthological Society President's Award, 2009 (*$900*)
- Binghamton Geomorphology Symposium Student Scholarship, 2009 (*$75)*
- Kirk Smith Ecological Restoration Institute Scholarship, 2005 (*$500*)
- Exchange Club Chapter and Regional Scholarships for Patriotism, 2003 (*$3,000*)
- Canon International Envirothon First Place in Aquatics Section, 2003
- Arizona Envirothon State Champions, 2003
- Eagle Scout (Boy Scouts of America), 2001

University of North Carolina at Chapel Hill

- Royster Society Fellowship, 2007-2012 (*~$200,000*)
- Graduate & Professional Student Federation Travel Award, 2009 (*$400*)

Northern Arizona University

- Gold Axe Award (most prestigious undergraduate award given at NAU), 2007
- Biology Senior Scholastic Award (outstanding undergraduate research), 2007 (*$250*)
- Bayless Biology Scholarship (highest GPA in Biology Department), 2007 (*$250*)
- Chemistry Senior Scholar Award (outstanding departmental contribution), 2007 (*$250*)
- Provost's Scholarship, 2003–2007 (*~$50,000*)
- Robert C. Byrd Arizona Scholarship, 2003–2007 (*$12,000*)
- Raymond Scoutmaster Scholarship, 2006 (*$500*)

TEACHING EXPERIENCE

ENST 201: Environment & Society. UNC, Chapel Hill, NC 8/2009–12/2009, 8/2012-12/2012.
- Course on (inter)national environmental issues and policies, ~200 students
- Taught 3 recitation sections of ~20 students each; lectured, graded, led discussions

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 as Graduate Research Consultant

GEOG 442: River Processes. UNC, Chapel Hill, NC 8/2010–12/2010
- Graduate/upper undergraduate 20-student class in fluvial geomorphology
- Lectured occasionally, prepared and graded assignments as Teaching Assistant

GEOG 110: Environmental Systems. UNC, Chapel Hill, NC 8/2008–12/2008, 1/2011–5/2011
- First-year environmental sciences lecture class for general college, ~150 students
- Lectured occasionally, graded, and held office hours as Teaching Assistant.

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 ~10 students considering graduate school
- Assisted with de novo course creation: Syllabus/scheduling/material development
- Designed, supervised, and maintained online class component as Teaching Assistant

STUDENTS & TECHNICIANS MENTORED

David Goodenough. USGS Undergraduate Biology Intern, 2014–Pres.
- Internship through USGS Pathways Youth and Education in Science Program

Josh Smith. USGS Research Ecologist, 2013–2014
- Published research on sticky trap designs and midge behaviors (see above)
- Current wildlife refuge specialist with US Fish and Wildlife Service, Sasabe, AZ

Patrick Clay. B.S. UNC Environmental Science, 2013. Research Assistant, 2009–2013
- UNC SURF Fellowship for international research on Tagliamento River (*$5,000*)
- Published research on confluences and braided river hydro-ecology (see above)
- Current Ph.D. student in aquatic ecology, Rice University

Ben Bogardus. B.S. UNC Environmental Science, 2010. Research Assistant, 2007–2010
- Undergraduate research on channel bathymetry of largest stream restoration in NC
- Completed masters degree in international water development, Villanova University

Daniel Band. B.S. UNC Environmental Science, 2010. Research Assistant, 2007–2010
- Completed masters degree, UNC Department of City & Regional Planning

PROFESSIONAL SERVICE

Constitutional Revision Committee. Society for Freshwater Science
- Chair 2017–Pres.; Member 2014–2016

Author English Help Volunteer
- Ecological Society of America, 2006–Pres.; Society for Freshwater Science, 2017–Pres.

Graduate Student President. UNC Curriculum for the Environment & Ecology, 2012–2013

Undergraduate Awards Committee. Society for Freshwater Science, 2012–2013

Seminar Committee. UNC Curriculum for the Environment & Ecology
- Chair 2011–2012; Member 2008–2009, 2010–2011

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

Ad-hoc Associate Editor. Ecological Applications, 2017

PROFESSIONAL SERVICE (CONTINUED)

Peer-Reviewer. (≥1 each)

- *Proposals:* NSF Division of Environmental Biology (DEB), Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI) Pathfinder Grant
- *General ecology:* Ecology, J Applied Ecol, Global Change Biol, Ecol & Evol, J Biogeography, Restoration Ecol, PeerJ, Oecologia
- *Aquatic ecology:* Freshwater Sci, Canadian J Fisheries & Aquatic Sci, River Research & Applications, Estuaries and Coasts, Aquatic Sci, Hydrobiologia, J Freshwater Ecol
- *Hydrology & geomorphology:* Water Resources Research, Limnology & Oceanography: Fluids & Environments, J American Water Resources Association

SYNERGISTIC ACTIVITIES

Internship Mentor. Doris Duke Conservation Scholars Program, 2014

Special Session Organizer and Chair. "Emergent insects as focal taxa for bridging ecological understanding across ecosystems: a synthesis of current knowledge and novel applications". Joint Aquatic Sciences Meeting, 2014.

"Science Expert." Chapel Hill Schools, NC Museum of Natural Science, NC State Fair, NC Division of Water Quality, NC Museum of Life & Science, Ravenscroft School. 2009–2013.

Virtual Science Fair Mentor. Ravenscroft School, 2011–2013

"Instars" Undergraduate Program Mentor. Society for Freshwater Science, 2012

Aquatic Ecology Consultant. Durham Museum of Life & Science, 2012

"Water Bug Expert." NC Museum of Natural Sciences "BugFest", NC Department of Water Quality, NC State Fair, 2010–2012

Graduate Research Consultant. UNC Cistern Water Quality Capstone, 2011

"Science Expert." Chapel Hill/Carrboro City Schools, 2009–2010

Envirothon Coach. Sinagua (AZ) High School Envirothon team, 2006–2007

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

Assistant Scoutmaster, Ropes Instructor & Trip Leader. Boy Scouts of America, 2003–2007

Chapter President/VP. NAU Student Affiliates of the American Chemical Society, 2005–2007

Organizer. Society of Environmental Communicators, 2005–2007

Volunteer. The Nature Conservancy, 2002–2005

Affiliated Member.

- Ecological Society of America (ESA), 2005–Pres.
- Society for Freshwater Science (SFS), 2008–Pres.
- Honor Society of Phi Kappa Phi, 2005–Pres.
- American Geophysical Union (AGU), 2007–2016
- Association for the Sciences of Limnology and Oceanography (ASLO), 2009–2016
- Sigma Xi, 2010–2016
- Society for Ecological Restoration International (SER), 2005–2014
- European Geosciences Union (EGU), 2011–2013
- Student Affiliates of the American Chemical Society (SAACS) 2003–2007