

## JEFFREY DANIEL MUEHLBAUER

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### EXPERTISE

*Project Management.* Oversight of budgets, staffing, and project timelines for day-to-day operations of a large research lab, supervision and mentoring, regular interactions and presentations with clients, stakeholders, and organizational superiors, responsibility for project execution and success.

*River Ecology.* Stream and riparian community ecology, large river ecosystems, cross-ecosystem subsidies, aquatic and riparian macroinvertebrates, food webs, stable isotope analysis, fish diets, 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.

*Statistics & Coding.* Multi-level mixed effects modeling, Bayesian forecasting, multivariate statistics, community analysis, ordination.

*Software & Database Development.* R package development, SQL and VBA-based database development, Microsoft Access and SQL Server-based database maintenance.

*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<sup>th</sup>–8<sup>th</sup> Order, heavily regulated, endangered species), 2013–Pres.
- Rio Chama, NM (5<sup>th</sup> Order, Wild and Scenic, recreation and water quality), 2020–Pres.
- Bright Angel Creek, AZ (1<sup>st</sup>–3<sup>rd</sup> Order, nonnative trout removal), 2016–Pres.
- Danube River Basin: Danube, Sava, & Drava Rivers, central Europe (7<sup>th</sup>–10<sup>th</sup> Order, ship traffic, groin fields, industrial forestry & fisheries, confluences), 2010–2011
- Tagliamento River, Italy (1<sup>st</sup>–7<sup>th</sup> Order, braided, alpine, un-dammed), 2010–2011
- Elbe River, Germany (8<sup>th</sup> Order, groin fields, cruise ship traffic), 2011
- Coweeta LTER & Little Tennessee River, NC (1<sup>st</sup>–6<sup>th</sup> Order, natural), 2009–2010
- Hudson & Indian Rivers, NY (5<sup>th</sup> Order, dam flood pulses), 2007
- Timberlake stream/wetland, NC (drought, restoration monitoring), 2007–2012
- Meeting of the Waters & New Hope Creeks, NC (3<sup>rd</sup> Order, urbanizing), 2008
- Fossil Creek, AZ (karst spring, dam removal), 2003–2007

### EDUCATION

*PhD Ecology.* University of North Carolina at Chapel Hill, 2013

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

*MS Ecology.* University of North Carolina at Chapel Hill, 2010

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

*BS 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, Alaska Cooperative Fisheries and Wildlife Research Unit.* Fairbanks, AK. Supervisor: Dr. Jeffrey A. Falke

- Assistant Unit Leader, Fisheries Biologist (GS-12), 4/1/2021–Pres, 40+ hrs/wk.

*University of Alaska Fairbanks, Institute of Arctic Biology, Department of Fisheries, and Department of Biology and Wildlife.* Fairbanks, AK.

- Assistant Professor, 4/1/2021–Pres (concurrent with AKCFWRU)

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

- Fisheries Biologist (GS-12), 1/1/2021–4/1/2021, 40+ hrs/wk.
- Research Biologist (GS-12), 5/1/2017–1/1/2021, 40+ hrs/wk.
- Postdoctoral Fellow, Research Ecologist (GS-12), 5/1/2013–5/1/2017, 40+ hrs/wk.

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

- University Fellow, 6/1/2007–5/1/2013, 40+ hrs/wk.
- Geography/Ecology TA/RA, 9/1/2008–5/1/2012, 40+ hrs/wk.

*Leibniz Institute of Freshwater Ecology & Inland Fisheries (IGB).* Berlin, Germany.

Collaborators: Drs. Klement Tockner, Michael T. Monaghan, Martin T. Pusch

- Visiting Fellow, 5/1/2011–9/1/2011, 40+ hrs/wk.
- Tagliamento River research station, 5/1/2010–9/1/2010, 40+ hrs/wk.

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

- Research Associate, Department of Biology, 8/1/2003–5/1/2007, 10-40+ hrs/wk.

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

- Assistant Crew Leader, 5/1/2006–9/1/2006, 60 hrs/wk.
- Research Assistant, 4/1/2004–5/1/2007, 10–60 hrs/wk.

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

- Chemist/Geneticist Intern, 5/1/2005–9/1/2005, 40+ hrs/wk.

*Boy Scouts of America Camp Raymond.* Parks, AZ.

- Ropes Course Instructor, 2003, 40 hrs/wk.

*Northland Youth Conservation Corps.* Flagstaff, AZ.

- Americorps Team Member, 2002, 40 hrs/wk.

## SCIENTIFIC PUBLICATIONS

*Asterisks (\*) indicate mentored student/technician lead author*

- 24) \*Abernethy, E.F., Muehlbauer, J.D., Kennedy, T.A., Tonkin, J.D., Van Driesche, R. & Lytle, D.A. (2021) Hydropeaking intensity and dam proximity limit aquatic invertebrate diversity in the Colorado River Basin. *Ecosphere* 12: e03559. DOI: 10.1002/ecs2.3559
- 23) \*Metcalf, A.N., Muehlbauer, J.D., Kennedy, T.A., Yackulic, C.B., Dibble, K.L. & Marks, J.C. (2021) Net-spinning caddisfly distribution in large regulated rivers. *Freshwater Biology*. 66:89–101. DOI: 10.1111/fwb.13617
- 22) Muehlbauer, J.D., Larsen, S., Jonsson, M. & Emilson, E.J.S. (2020) Variables affecting resource subsidies from streams and rivers to land and their susceptibility to global change stressors. In: *Contaminants and Ecological Subsidies: The Land-Water Interface* (Eds J.M. Kraus, D.M. Walters & M.A. Mills), pp 129–155. Springer, Cham, Switzerland. DOI: 10.1007/978-3-030-49480-3\_7
- 21) \*Metcalf, A.N., Kennedy, T.A., Marks, J.C., Smith, A.D. & Muehlbauer, J.D. (2020) Spatial population structure of a widespread aquatic insect in the Colorado River Basin: evidence for a *Hydropsyche oslari* species complex. *Freshwater Science* 39:309–320. DOI: 10.1086/709022

## SCIENTIFIC PUBLICATIONS (CONTINUED)

- 20) Muehlbauer, J.D., Lupoli, C.A. & Kraus, J.M. (2019) Aquatic–terrestrial linkages provide novel opportunities for freshwater ecologists to engage stakeholders and inform riparian management. *Freshwater Science* 38:946–952. DOI: 10.1086/70610
- 19) Muehlbauer, J.D., Kennedy, T.A., Copp, A.J. & Sabol, T.A. (2017) Deleterious effects of net clogging on the quantification of stream drift. *Canadian Journal of Fisheries and Aquatic Sciences* 74:1041–1048. 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 Stream Ecology* (Eds F.R. Hauer & G.A. Lamberti), 3<sup>rd</sup> 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
- 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
- 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
- 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. In: *Treatise on Geomorphology* (Ed J.F. Schroder), Vol. 9, *Fluvial Geomorphology* (Ed E. Wohl), pp 189–202. Academic Press, San Diego, CA. DOI: 10.1016/B978-0-12-374739-6.00237-2

## SCIENTIFIC PUBLICATIONS (CONTINUED)

- 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

- 25) \*Metcalf, A.N., Ford, M.A., Muehlbauer, J.D. & Kennedy, T.A. (In Press) Colorado River Basin. In: *Rivers of North America* (Eds M.D. Delong & T.D. Jardine), 2<sup>nd</sup> edition. Academic Press, Boston, MA.
- 26) \*Metcalf, A.N., Kennedy, T.A., Mendez, G. & Muehlbauer, J.D. (In Review) Applied citizen science in freshwater research. *For WIREs Water*
- 27) 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*
- 28) \*Abernethy, E.F., Muehlbauer, J.D., Kennedy, T.A., Dziedzic, K.E., Elder, H., Burke, M.K. & Lytle, D.A. (In Review) Population connectivity of aquatic insects in a dam-regulated, desert river. *For River Research and Applications*

## THESES

- 2) Muehlbauer, J.D. (2013) "Stream signatures" and aquatic-terrestrial interactions in arthropod food webs. PhD 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

- 5) \*Metcalf, A., Muehlbauer, J., Kennedy, T. & Ford, M. (2020) Bug Flows: don't count your midges until they hatch. *Boatman's Quarterly Review*, Spring 2020: 5 pp.
- 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 RELEASES

- 7) Muehlbauer, J.D. & Abernethy, E.F. (2021) Benthic macroinvertebrate tailwater data in the Colorado River Basin, 2013 & 2015. *USGS Data Release*. DOI: 10.5066/P9DM0X8U.
- 6) Ryan, A., Ford, M., Muehlbauer, J., Kennedy, T. & Deemer, B.R. (2020) Carbon, nitrogen, and phosphorus content of adult emergent Diptera before and after a fire-storm sequence in the Colorado River near Shinumo Creek, Grand Canyon, AZ. *USGS Data Release*. DOI: 10.5066/P9ODBTRV
- 5) Muehlbauer, J.D., Metcalfe, A.N., Kennedy, T.A. & Ford, M.A (2019) Insect catch rates and angler success data during Bug Flows at Glen Canyon Dam. *USGS Data Release*. DOI: 10.5066/P9WA8D0G
- 4) Muehlbauer, J.D., Kennedy, T.A., Copp, A.J. & Sabol, T.A. (2017) Stream drift sampling in Arizona, 2014—Data. *USGS Data Release*. DOI: 10.5066/F71J97WD
- 3) \*Metcalf, A.N., Kennedy, T.A. & Muehlbauer, J.D. (2016) Angel lichen moth abundance and morphology data, Grand Canyon, AZ, 2012. *USGS Data Release*. DOI: 10.5066/F7154F5S
- 2) Kennedy, T.A. & Muehlbauer, J.D. (2016) Flow management, aquatic insects and river food webs—Data. *USGS 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.

## SOFTWARE & DATABASE DEVELOPMENT

- 6) *GCgage* package for R statistical software (In Prep) Functions for using Colorado River gage data to route discharge, temperature, and turbidity through the Grand Canyon. *Available on GitHub*.
- 5) *Foodbase* SQL Server Database with Microsoft Access front end (2019) SQL/VBA-based database infrastructure for data entry, management, QA/QC, formatting, and export. *Data available on GitHub*.
- 4) *packload* function for R statistical software (2019) Convenience wrapper for loading R libraries. *Available on GitHub*.
- 3) *foodbase* package for R statistical software (2017) Functions for reading and working with Foodbase data. *Available on GitHub*.
- 2) *plots* package for R statistical software (2016) Convenience functions for common plotting operations. *Available on GitHub*.

## SOFTWARE & DATABASE DEVELOPMENT (CONTINUED)

- 1) *bugR* package for R statistical software (2016) Functions for common ecological analyses of invertebrate data. Available on *GitHub*.

## MEDIA COVERAGE

- 25) *National Public Radio KNAU* (2020) Featured in story about contrasting goals in Colorado River flow experiments <https://www.knau.org/post/colorado-river-bugs-spark-two-unprecedented-experiments-opposite-goals>
- 24) National Socio-Environmental Synthesis Center (2020) Article describing interdisciplinary collaboration <https://www.sesync.org/news/mon-2020-06-08-2149/researchers-share-key-ingredients-for-building-momentum-for>
- 23) *This Week at Interior* (2020) Weekly US Department of the Interior video, highlighting third Bug Flows experiment <https://www.doi.gov/video/this-week-interior-may-8-2020>
- 22) Bureau of Reclamation (2020) Official press release describing third Bug Flows experiment <https://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=70708>
- 21) *Payson Roundup* (2019) Story describing angling study during Bug Flows experiment [https://www.paysonroundup.com/news/local/what-is-a-bug-flow-experiment/article\\_3507528b-b4b3-54d1-8ba4-bebeac43e360.html](https://www.paysonroundup.com/news/local/what-is-a-bug-flow-experiment/article_3507528b-b4b3-54d1-8ba4-bebeac43e360.html)
- 20) *National Public Radio KNAU* (2019) Featured in story about second Bug Flows experiment <https://www.knau.org/post/bugs-benefit-low-weekend-flows-colorado-river>
- 19) *Associated Press*, picked up by *National Public Radio*, *The New York Times*, *The Washington Post* and others (2019) Story describing results of the Bug Flows experiment <https://www.apnews.com/559d592341b14993af436845c7db4a31>
- 18) *This Week at Interior* (2020) Weekly US Department of the Interior video, highlighting second Bug Flows experiment <https://www.doi.gov/video/this-week-interior-may-17-2019>
- 17) Bureau of Reclamation (2019) Official press release describing second Bug Flows experiment <https://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=65908>
- 16) *Scientific American* (2019) Article about conducting aquatic ecology research in Grand Canyon <https://www.scientificamerican.com/article/re-engineering-the-colorado-river-to-save-the-grand-canyon>
- 15) *Associated Press*, picked up by *The New York Times*, *The Washington Post*, *US News and World Report*, and others (2018) Story describing the Bug Flows experiment <https://apnews.com/accec230d442406fa7bedf4af219c5d1>
- 14) Bureau of Reclamation (2018) Official press release describing Bug Flows experiment <https://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=62133>
- 13) *Undark Magazine* (2018) Essay about conducting aquatic ecology research in Grand Canyon <https://undark.org/article/wilo-doyle-colorado-river-insects/>
- 12) *Science Magazine* (2016) Scientific reinterpretation of the *BioScience* hydropeaking paper. <http://science.sciencemag.org/content/353/6304/1099>
- 11) *Arizona Daily Sun* (2016) Story about *BioScience* hydropeaking paper. [http://azdailysun.com/news/local/dam-management-plan-aims-to-boost-native-fish-bugs/article\\_8f2a949c-03ee-5f96-86b4-eda52fd0ffbf.html](http://azdailysun.com/news/local/dam-management-plan-aims-to-boost-native-fish-bugs/article_8f2a949c-03ee-5f96-86b4-eda52fd0ffbf.html)
- 10) *National Public Radio KNAU* (2016) Story about *BioScience* hydropeaking paper. <http://knau.org/post/study-hydropower-decimates-aquatic-insects-colorado-river#stream/0>
- 9) *High Country News* (2016) Reinterpretation of *BioScience* hydropeaking paper. <https://www.hcn.org/issues/48.12/new-measures-could-reduce-glen-canyon-dams-impact-on-the-grand-canyon-a-bit>

## **MEDIA COVERAGE (CONTINUED)**

- 8) *Columbia Basin Fish & Wildlife News Bulletin* (2016) Summary of *BioScience* hydropeaking paper. <http://www.cbbulletin.com/436660.aspx>
- 7) American Fisheries Society (2016) Summary of *BioScience* hydropeaking paper. <https://fisheries.org/2016/05/citizen-science-reveals-how-river-food-webs-are-affected-by-hydropower-practices/>
- 6) *Conservation Magazine* (2016) Summary of *BioScience* hydropeaking paper. <http://conservationmagazine.org/2016/05/simple-trick-make-dams-less-damaging-river-ecosystems/>
- 5) USGS (2016) Official press release for *BioScience* hydropeaking paper. <https://www.usgs.gov/news/river-food-webs-threatened-widespread-hydropower-practice>
- 4) Oregon State University (2016) Official press releases for *BioScience* hydropeaking paper. <https://today.oregonstate.edu/archives/2016/may/hydropeaking-river-water-levels-disrupting-insect-survival-river-ecosystems>
- 3) *BioScience* (2016) Editor's choice selection for *BioScience* hydropeaking paper. <http://bioscienceaibs.libsyn.com/hydroelectric-dams-kill-insects-wreak-havoc-with-food-webs>
- 2) *Faculty of 1000* (2004) Write up regarding "Stream Signatures" *Ecology* paper. <https://f1000.com/prime/718343875>
- 1) SFS Podcast "Making Waves" (2004) Interview regarding "Stream Signatures" *Ecology* paper. <https://conference.usu.edu/sfsweb/Education-and-Outreach/Media/Podcast/MW12---Jeffery-Muehlbauer.cfm>

## **INVITED SEMINARS**

- 11) "Bug Flows" in Lees Ferry and Grand Canyon. Trout Unlimited Chapter Meeting, 2020
- 10) "Bug Flows!" USGS Southwest Biological Science Center Brown Bag, 2019
- 9) "Dammed and adrift in the Colorado River Basin." USGS Southwest Biological Science Center All-Hands Meeting, 2017
- 7-8) "Beyond the meter tape: defining ecological boundaries using food web metrics." ASU Polytechnic Global Institute of Sustainability Seminar, 2015; NAU Biology Department Seminar, 2017
- 6) "Food web ecology in the Colorado River in Grand Canyon." NAU Wildlife Society Chapter Meeting, 2015
- 5) "'Stream signatures' and aquatic-terrestrial interactions in arthropod food webs." USGS Southwest Biological Science Center Brown Bag Seminar, 2013
- 4) "'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
- 3) "Stream signatures: Assessing Hydrologic and geomorphic controls in riverine-floodplain biotic subsidies." IGB Seminar, 2010
- 2) "Water, watersheds & people." UNC special course on water issues, 2010
- 1) "Carbon dioxide" (for 200 children). Chapel Hill/Carrboro City Schools, 2009

**CONFERENCE PRESENTATIONS (LEAD AUTHOR)**

- 24) Muehlbauer, J.D. & Kennedy, T.A. (2019) Colorado River ecosystem responses to the 2018 Bug Flow experiment from Glen Canyon Dam. SFS.
- 23) Muehlbauer, J.D. & Kennedy, T.A. (2018) Invertebrate drift throughout Colorado River Basin tailwaters. Lower Colorado River Science Symposium.
- 22) Muehlbauer, J.D. (2018) Aquatic invertebrate drift patterns downstream of Colorado River Basin dams. Colorado River Aquatic Biologists Meeting.
- 20) 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.
- 19) Muehlbauer, J.D. & Kennedy, T.A. (2016) Dammed and adrift: patterns of invertebrate drift throughout Colorado River Basin tailwaters. SFS.
- 18) 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.
- 17) 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.
- 16) 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.
- 15) Muehlbauer, J.D., Kennedy, T.A. & Yackulic, C.B. (2013) Shear stress drives local variation in invertebrate drift in a large river. AGU.
- 14) Muehlbauer, J.D. (2013) How long is "long enough" in ecological restoration monitoring? UNC Curriculum for the Environment & Ecology Student Research Symposium.
- 13) 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.
- 12) 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.
- 11) Muehlbauer, J.D., Tockner, K. & Doyle, M.W. (2011) "Stream signatures:" aquatic subsidy importance to terrestrial food webs with distance from the stream. NABS.
- 10) 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.
- 9) 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.
- 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.



## CONFERENCE PRESENTATIONS (LEAD AUTHOR, CONTINUED)

- 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.

## GRANTS & RECOGNITIONS

~\$7,000,000 in total grant and fellowship support

*Federal Agencies (\* indicate lead PI or mentored student/technician lead, all others Co-PI)*

- Bureau of Reclamation Glen Canyon Dam Adaptive Management Program 3-year workplan for aquatic foodbase research in Colorado River, 2021–2023 (\$2,175,000)
- Bureau of Reclamation WaterSMART grant for Rio Chama aquatic insect water quality monitoring (with New Mexico Wilderness Alliance), 2020–2021 (\$39,000)
- \*Bureau of Reclamation support for aquatic invertebrate monitoring during Bright Angel Creek trout removal, 2019–2021 (\$56,000)
- Bureau of Reclamation Experimental Fund support for additional research and monitoring during Bug Flows experiment, 2018–2021 (\$181,000)
- \*NSF-USGS INTERN Program support, 2020

*Federal Agencies (Continued)*

- Bureau of Reclamation Glen Canyon Dam Adaptive Management Program 3-year workplan for aquatic invertebrate ecology, 2018–2020 (\$2,362,000)
- Bureau of Reclamation Glen Canyon Dam Adaptive Management Program 3-year workplan for aquatic foodbase research in Colorado River, 2015–2017 (\$1,148,000)
- \*Western Area Power Administration grant for aquatic food web 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)

## TRAININGS

*Socio-Environmental Approaches to Watershed Management and Governance.* Socio-Environmental Synthesis Center (SESYNC), Annapolis, MD, 2020

*Ecological Forecasting Short Course.* Near-Term Ecological Forecasting Initiative, Boston, MA, 2018

*CPR/AED.* American Red Cross, Flagstaff, AZ 2018

*Wilderness First Aid.* Wilderness Medical Association, Flagstaff, AZ 2016

*Motorboat Operator Certification Course (MOCC).* US Department of the Interior, Flagstaff, AZ 2015

*Leadership Intensive Training.* US Geological Survey, Flagstaff, AZ 2015

*ONE Leadership Training.* US Department of the Interior, Flagstaff, AZ 2014

*Ecosystem Ecology Short Course.* Cary Institute of Ecosystem Studies, Millbrook, NY, 2010

## MENTORING

*Christina Lupoli.* Ph.D. student, Arizona State University, 2016–2021.

- Committee member for project on aquatic-terrestrial linkages on the Colorado River
- Mentor for NSF-USGS INTERN program

*Erin Abernethy.* Ph.D. student, Oregon State University, 2015–2021.

- Mentor for NSF-USGS Graduate Research Improvement Program (GRIP) Intern

*Anya Metcalfe.* M.S. NAU, 2015–2018, GS-09 Ecologist 2018–2021.

- GS-09 ecologist specializing in aquatic ecology of large rivers
- Unofficial mentor during MS degree

*Morgan Ford.* USGS GS-09 Ecologist, 2016–2021.

- Lab manager overseeing day-to-day operations of lab

*David Goodenough.* B.S. NAU, 2014–2017, USGS GS-07 Ecologist 2014–2020.

- Internship through USGS Pathways Youth and Education in Science Program

*Eric Kortenhoeven.* USGS GS-07 Ecologist, 2013–2017

- Research technician and mentee in ecological field studies
- Left to pursue M.S. in aquatic ecology, Oregon State University

*Josh Smith.* USGS GS-09 Ecologist, 2013–2014

- Published research on sticky trap designs and midge behaviors (see above)
- Current GS-09 wildlife refuge specialist with US Fish and Wildlife Service, Burbank, WA

*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)
- Completed PhD in disease 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

## TEACHING

*FISH/BIOL F492P/F692P: Readings in Stream Ecology.* UAF, Fairbanks, AK, 1/2022–5/2022.

- Seminar on classic readings in the field; lead instructor

*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

## TEACHING (CONTINUED)

*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

## PROFESSIONAL SERVICE

*Justice, Equity, Diversity, and Inclusion (JEDI) Committees.* UAF

- Co-Chair (Dept. Biology & Wildlife) 2021–Pres.; Member (Dept. Fisheries) 2021–Pres.

*Constitutional Revision Committee.* Society for Freshwater Science

- Chair 2017–2018; Co-Chair 2020–2021.; Member 2014–2016, 2019–2020, 2021–Pres.

*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

*Associate Editor.* Aquatic Sciences, 2021–Pres.

*Ad-hoc Associate Editor.* Ecological Applications, 2017

*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, Ecosystems, J Biogeography, Restoration Ecol, PeerJ, Oecologia, Ambio, Sci Total Env, Env Entomology, PLoS ONE, Methods in Ecol & Evol, Biol Invasions
- *Aquatic ecology:* Freshwater Sci, Canadian J Fisheries & Aquatic Sci, River Research & Appl, Estuaries and Coasts, Aquatic Sci, Hydrobiologia, J Freshwater Ecol
- *Hydrology & geomorphology:* Water Resources Research, Limnology & Oceanography: Fluids & Env, J American Water Resources Assoc, J Hydrology, Hydrol Processes

## SYNERGISTIC ACTIVITIES

*"Science Expert."* Flagstaff Schools, Trinity Heights United Methodist Church, Chapel Hill/Carrboro City Schools, 2009–2021.

*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.

*Virtual Science Fair Mentor.* Ravenscroft School, 2011–2013

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

**SYNERGISTIC ACTIVITIES (CONTINUED)**

*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

*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