

## **Cailin Huyck Orr, Ph.D.**

Science Education Resource Center  
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### **EDUCATION**

2005	Ph.D.	UNIVERSITY OF WISCONSIN - Madison, WI
2002	M.S.	Limnology and Marine Science
1996	B.A.	CARLETON COLLEGE, Northfield, MN Biology

### **EMPLOYMENT**

Associate Director 2014 - Current	Science Education Resource Center CARLETON COLLEGE, Northfield MN
Adjunct Graduate Faculty 2014 – 2019	WASHINGTON STATE UNIVERSITY, Pullman WA School of the Environment
Assistant Professor 2009-2014	WASHINGTON STATE UNIVERSITY, Pullman WA School of the Environment
Adjunct Instructor Spring 2008	ST. OLAF COLLEGE, Northfield, MN Conservation Biology Course
Post-doctoral Associate 2006-2008	National Center for Earth-Surface Dynamics UNIVERSITY OF MINNESOTA, Minneapolis, MN St. Anthony Falls Laboratory
Post-doctoral Fellow 2005-2006	UNIVERSITY OF NORTH CAROLINA, Chapel Hill NC Institute for the Environment
Graduate Assistant 2000-2003	NSF-IGERT program “Social and Aquatic Systems” UNIVERSITY OF WISCONSIN – Madison, WI

### **SELECTED PROFESSIONAL ACTIVITIES**

Program Development: Louis Stokes Alliance for Minority Participation NSF program “*IINSPIRE*” lead by Iowa State University. Responsible for working with project leadership to host semi-annual professional development activities to promote active pedagogy in support of broadening access to STEM fields

Project Leadership, NSF STEP Center: Interdisciplinary Teaching about Earth for a Sustainable Future “*InTeGrate*”. Managed 16 teams, across the US, increasing access to learning about the Earth in new contexts and for diverse students.

Steering Committee, NSF IUSE “*Creating and Studying a National Network of Centers of STEM Education: Infrastructure for Educational Transformation*” led by the Alfred P. Sloan Foundation and responsible for organizing a network of campus-based STEM Centers from ~100 institutions nationwide.

## **AWARD**

2018 Stokes Award for Outstanding Service to the IINSPIRE LSAMP Alliance

## **PEER REVIEWED PUBLICATIONS** +student co-author

McDaris, J.R., E.R. Iverson, C.A. Manduca, C.H. Orr. 2019. Teach the Earth: Making the connection between research and practice in broadening participation. *Journal of Geoscience Education* doi.org/10.1080/10899995.2019.1616272

McDaris, J.R., C.A. Manduca, E.R. Iverson, C.H. Orr. 2017. Looking in the Right Places: Minority Serving Institutions as Sources of Diverse Earth Science Learners. *Journal of Geoscience Education* 65:407-415.

+Kelley, C.J., C.K. Keller, J.L. Smith, E. Brooks, C.H. Orr. 2017. Water and Nitrogen movement through a semi-arid dryland agroecosystem: Seasonal and decadal trends. *Hydrological Processes*. doi:10.1002/hyp.11152.

+Ortega-Pieck, A. A.K. Fremier, C. H. Orr. 2017. Agricultural influences on the magnitude of whole-stream metabolism in humid tropical headwater streams. *Freshwater Science*. doi:10.1007/s10750-017-3204-5.

Orr, C.H., Manduca, C.A. 2016. Interdisciplinary Teaching of Geoscience for a Sustainable Future: InTeGrate. *In the Trenches* 6:3:3-4.

Orr C.H, K.I. Predick, E.H. Stanley and K.L. Rogers. 2014. Spatial variability of denitrification and associated soil properties on a restored and a natural floodplain. *Wetlands* 34:89-100.

+Kelley, C.J., C. Keller, R.D. Evans, C.H. Orr, J.L. Smith, and B.A. Harlow. 2013 Nitrate-nitrogen and oxygen isotope ratios for identification of nitrate sources and dominant nitrogen cycle processes in a tile-drained dryland agricultural field. *Soil Biology and Biochemistry* 57:731-738.

+Singh, A, J. Marr, C. Hill, S. Johnson, C. Ellis, J. Mullin, C.H. Orr, P. Wilcock, M. Hondzo, C. Paola, E. Foufoula-Georgiou. 2012 StreaLab: Overview of experiments, instrumentation, and data collected. *Water Resources Research* 49:1746-1752..

Orr, C.H. J.J. Clark, P.R. Wilcock, M.W. Doyle. 2009. Impact of channel geometry and algae growth on hyporheic exchange and nutrient uptake : Insights from a field-scale flume. *JGR Biogeosciences* 114, G02019, doi:10.1029/2008JG000825.

Wilcock, P.R, C.H. Orr, J. Marr. 2008. Particles, solutes, and life in flowing water: a large-scale multidisciplinary experiment at St Anthony Falls Laboratory. *EOS* 89(1): 6.

Orr, C.H., S.J. Kroiss, K.L. Rogers and E.H. Stanley. 2008. Response of benthic sediments and metabolism to dam removal in a small Wisconsin stream. *River Research and Applications* 24(6): 804.

+Riggsbee, J.A, C.H. Orr, J.C. Julian, D.A. Leech, M.W. Doyle, and R.G. Wetzel. 2008.

- Suspended sediment, carbon and nitrogen fluxes and transformations during the dewatering of a low-head impoundment. *Journal of Geophysical Research – Biogeosciences* doi:10.1029/2007JG000654
- Orr, C.H., E.H. Stanley, K.A. Wilson, and J.C. Finlay. 2007. Changes in denitrification following reintroduction of flooding to a leveed Midwestern floodplain. *Ecological Applications* 17: 2365–2376.
- Stanley, E.H., M.J. Catalano, N. Mercado-Silva and C.H. Orr. 2007. Implications of small dam removal for distribution of non-native trout in Central Wisconsin. *River Research and Applications* 23:792-798.
- Orr, C.H., K.L. Rogers, and E.H. Stanley. 2006. Phosphorus uptake and channel geometry following small dam removal. *Journal of the North American Benthological Society* 25:556-568.
- Orr, C.H. and E.H. Stanley. 2006. Vegetation development and restoration potential of drained reservoirs following dam removal in Wisconsin. *River Research and Application* 22:281-295.
- Doyle, M.W., E.H. Stanley, C.H. Orr, A.R. Selle, and J.M. Harbor. 2005. Fluvial geomorphic controls on stream ecosystem processes: Lessons from the heartland of small dam removals. *Geomorphology* 71: 227-244.
- Orr, C.H. and B.M. Roth, J.D. Gonzales, K.J. Forshay, M.M. Papenfus, and R.D.G. Wassell. 2004. An Examination of Physical and Regulatory Variables Leading to Small Dam Removal in Wisconsin. *Environmental Management* 33(1):99-109.
- Overdeest, C., C.H. Orr and C. Stepenuk. 2004. Volunteer stream monitoring and local participation in natural resource issues. *Human Ecology Review* 11(2):177-185.

## **BOOK CHAPTERS**

- Metzger, E, D. Gosselin, and C.H. Orr. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. In J.C. Gill and M. Smith, Editors, *Geology and the Sustainable Development Goals: Facilitating Responsible Earth Stewardship*. Springer-Nature. *In Press*.
- Orr, C.H. and J.R. McDaris. 2019. Supporting implementation of program-level changes to increase learning about Earth. In A. Egger, J. Taber and D. Gosselin editors, *Interdisciplinary Teaching about Earth and the Environment for a Sustainable Future*, Springer.

## **OTHER PUBLICATIONS AND REPORTS**

- Fremier, A.K, and C.H. Orr. 2014. The effects of river restoration on nutrient retention and transport for aquatic food webs. Report to the Washington Water Research Center.
- Orr, C.H., and J. Harrison. 2012. Climate change, land-water transfer, and in-stream fate of nitrogen in an agricultural setting. Report to the Washington Water Research Center.
- Research in Landscape Sustainability: Earth-surface processes in the SEES context. GLD Science, Engineering, and Education for Sustainability workshop group\*, October 2011. [https://netfiles.umn.edu/xythoswfs/webui/xy-19935902\\_1-t\\_cLewUwIG](https://netfiles.umn.edu/xythoswfs/webui/xy-19935902_1-t_cLewUwIG)

- Barber, M., M. Beutel, W. Helander, B. Moore, C. H. Orr, L. Tran, and K. Rajagopalan. 2010. An Assessment of the Most Suitable Water Levels for Osoyoos Lake. Report prepared for Washington State Department of Ecology.
- Barber, M., M. Beutel, W. Helander, B. Moore, C. H. Orr, L. Tran, and K. Rajagopalan. 2010. Effects of Zosel Dam Water Regulation on Osoyoos Lake Water Quality. Report prepared for Washington State Department of Ecology.
- Barber, M., M. Beutel, W. Helander, B. Moore, C. H. Orr, L. Tran, and K. Rajagopalan. 2010. An Investigation of Methods for Including Ecosystem Requirements in Orders of Approval. Report prepared for Washington State Department of Ecology.
- Orr, C.H., A.F. Lightbody. 2009. Stream Restoration Research in the Outdoor StreamLab, a New Facility at the University of Minnesota. *Ecological Restoration* 27:394-396.
- Lightbody, A.F., P. Belmont, J. Marr, C.H. Orr, C. Paola. 2009. Determination of appropriate metric(s) for sediment-related total maximum daily loads (TMDLs). Report to the Minnesota Water Research Center.
- Orr, C.H., S. Koenig. 2006. Contribution of seed-bank and planting to vegetation recolonization following dam removal. *Ecological Restoration* 24:79-86.
- Orr, C.H. 2005. Review of ecological response in recent river restorations. *Ecological Engineering Technical Notes* 2:12-19.
- Orr, C. 2001. Review: Dams and Development: A New Framework for Decision-Making: The report of the world commission on dams. *Environmental Practice* 3(3):191-912.

**SELECT PRESENTATIONS \*invited +student co-author**

- Orr, C.H., C. O'Reilly, E.A.R. Iverson, D.C. Soule, A. Haveles. 2019. Promoting teaching of quantitative reasoning using environmental data: Project EDDIE. ED13D-0908. Poster. American Geophysical Union, Fall Meeting, San Francisco CA.
- Metzer, E.P., D.C. Gosselin, C.H. Orr. 2019. Earth education for addressing obstacles to sustainability. PA32D-17. Poster. American Geophysical Union, Fall Meeting, San Francisco CA.
- Fox, S., C.A. Manduca, C.H. Orr, E.A.R. Iverson, 2019. Making research data visible to educators: dissemination through SERC. ED11B-0857. Poster. American Geophysical Union, Fall Meeting, San Francisco CA.
- Awalt, M., D. Blockstein, C.H. Orr, W.A. Robinson, S. Mulkey, C.A. Riihimaki, and D.D. Rhodes. 2019. Strengthening cross-campus programs to enhance interdisciplinary environmental and sustainability education through traveling workshops. Poster. American Geophysical Union, Fall Meeting, San Francisco CA.
- Haveles, A., S. Eriksson, E.A.R. Iverson, C. O'Reilly, R. Darner, E. Altermatt, K. O'Connell, C.H. Orr, D.C. Soule, T. Meixner. 2019. Project EDDIE: Supporting Teaching Quantitative Reasoning Using Large Datasets. *Earth Educator's Rendezvous*, Nashville, TN.
- Orr, C.H., H. Scherer, C. Forbes, M. Bruckner. 2018. Teaching about Food, Water and

- Energy in the Context of Sustainability: Opportunities and Connections with the InTeGrate STEP Center. Poster. American Geophysical Union, Fall Meeting, Washington D.C.
- O'Reilly, C., C. Carey, R. Gougis, D. Soule, T. Meixner, J. Klug, D. Richardson, N. Baer, D. Castendyk. W.J. Hunter, K. Weathers. C.H. Orr. 2018. Environmental Data-Driven Inquiry and Exploration (Project EDDIE): Using Large Datasets to Build Quantitative Literacy. Poster. American Geophysical Union, Fall Meeting, Washington D.C.
- McDaris, J.R., C.A. Manduca, E.R. Iverson, C.H. Orr. 2018. Teach the Earth: Linking Research and Practice to Attract, Support, and Prepare Diverse Students for Geoscience Careers. Poster. American Geophysical Union, Fall Meeting, Washington D.C.
- Soule, D., T.J. Crone, C. O'Reilly, and C.H. Orr. 2018. Environmental Data-Driven Inquiry and Exploration (Project EDDIE): Successes and Challenges Using Large Online Datasets to Build Quantitative Reasoning. Poster. American Geophysical Union, Fall Meeting, Washington D.C.
- Orr, C.H., E. Dolan, J.R. McDaris. 2018. CUREnet: Faculty network for designing, teaching and evaluating CURES. Poster. Geological Society of America Annual Meeting Indianapolis, IN.
- Orr, C.H., J.R. McDaris, C.A. Manduca. 2018. Lessons from the InTeGrate (Interdisciplinary Teaching about Earth for a Sustainable Future) STEP Center on Program Scale Change: Synthesizing Real-World Experience. (Poster). Ecological Society of America. Annual Meeting. New Orleans, LA.
- Orr, C.H., J.R. McDaris, C.A. Manduca. 2018. Teaching about Earth for a Sustainable Future: The InTeGrate STEM Talent Expansion Program Center. Ecological Society of America, Annual Meeting. New Orleans, LA.
- Manduca, C.A. et al. 2018. InTeGrate project: Interdisciplinary Teaching about the Earth for a Sustainable Future. European Geophysical Union. General Assembly, Vienna.
- Orr, C.H. and J.R. McDaris. 2017. Lessons from InTeGrate on Program-Scale Change: Synthesizing Real-world experience. Poster. Geological Society of America. Annual Meeting Seattle, WA.
- Orr, C.H., S. Fox, A.E. Egger, J.M. Wenner. 2017. Teach the Earth: Newly Envisioned Portal for Geoscience Education Resources. Poster. Geological Society of America. Annual Meeting Seattle, WA.
- Orr, C.H. and J. E. Swartz. 2017. IINSPIRE-LSAMP Alliance professional development workshops in support of broadening participation in STEM. Network of STEM Education Centers, Annual meeting, New Orleans, LA.
- Kastens, K, and C.H. Orr 2017. Using Design Patterns as a Strategy for Capturing 'Generalizable Knowledge' from Educational Interventions. Earth Educator's Rendezvous. Albuquerque, NM.
- Orr, C.H., R. McFadden, C.A. Manduca, L. Kemplar. 2016. Resources and approaches for teaching quantitative and computational skills in the geosciences and allied fields. ED43D-0886. American Geophysical Union. Fall Meeting. San Francisco, CA
- \*Orr, C.H. 2016. Models of Program-Scale Change. Heads & Chairs Summit: On the

- Future of Undergraduate Geoscience Education. UT-Austin, TX.
- Orr, C.H., C.A. Manduca, F. Davis, D. Blockstein. 2015. Teaching Coastal Hazards, Risk and Environmental Justice. American Geophysical Union, Fall Meeting. San Francisco, CA.
- Egger, A.E., A. Awad, S. Sullivan, C.H. Orr, M. Valentina. 2015. Building a Sustainable Future: The Imperative and Opportunities to Engage All Future Teachers in Earth Science. Geological Society of America. Annual Meeting, Baltimore, MA.
- Orr, C.H. and C.M. Manduca. 2015. Interdisciplinary curriculum and strategic partnerships to increase interest in and access to STEM. APLU, Science and Math Teaching Imperative National Conference. New Orleans, LA
- Bruckner, M., C.H. Orr and C.A. Manduca. 2015. Bridging Science and Public Understanding of Long-term Soil, Water, and Vegetation Monitoring: Opportunities for broader impact connections with InTeGrate. Poster. American Geophysical Union, Fall Meeting. San Francisco, CA.
- Orr, C.H., Keller, C.K., <sup>+</sup>Kelley, C.J., <sup>+</sup>Moon-Nielsen, L, <sup>+</sup>Martin R.A. 2014. Do greenhouse gases evaded from an agricultural stream have a terrestrial source? Joint Aquatic Science Meeting. Portland, OR.
- \*Orr, C.H., J. Adam, A. Beall. 2013. Improving future water use planning in the Columbia River Basin by linking interdisciplinary earth system modeling with collaborative stakeholder modeling. Society for Freshwater Sci. Jacksonville, FL
- Orr, C.H., L. <sup>+</sup>Moon-Nielsen, <sup>+</sup>J. Schwarz, <sup>+</sup>C.J. Kelley. C.K. Keller. 2013. Seasonality in flux of nitrogen to streams and atmosphere in a semi-arid and dryland agriculture dominated watershed. Ecological Society of America, Minneapolis, MN
- Orr, C.H., J. Adam, A. Beall, M. Barber and <sup>+</sup>T. Nguyen. 2012. Using Linked Models to Study Interactions Between Water Use Decisions and Climate Change-Driven Watershed Processes in the Pacific Northwest Region. American Geophysical Union, Fall Meeting. San Francisco, CA.
- <sup>+</sup>Moon-Nielsen, L. and C.H. Orr. 2012. The spatiotemporal coupled measurement of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O in a semi-arid agricultural stream and the importance of intra-stream studies. American Geophysical Union, Fall Meeting. San Francisco, CA.
- <sup>+</sup>Kelley, C.J., C.K. Keller, E. Brooks, J.L. Smith, C.H. Orr, and R.D. Evans. 2012 Nitrate transport and fluxes during storm-event discharge from a 12 ha tile-drained dryland agricultural field. American Geophysical Union, Fall Meeting. San Francisco, CA.
- Orr, C.H. and <sup>+</sup>K. Tillotson. 2012. Using Case Studies to Teach Interdisciplinary Water Resource Sustainability. American Geophysical Union, Fall Meeting. San Francisco, CA.
- <sup>+</sup>Moon-Nielsen, L. and C.H. Orr. 2012. Improving estimates of in-stream nitrogen transformations by applying spatiotemporal variability in a semi-arid agricultural stream. Ecological Society of America, Annual Meeting, Portland, OR.
- <sup>+</sup>Kelley, C.J., C.K. Keller, R.D. Evans, C.H. Orr, and J.L. Smith. 2011. Using NO<sub>3</sub>-N and NO<sub>3</sub>-O isotope ratios to identify nitrogen sources and cycling in the Palouse Basin. 8th Washington Hydrogeology Symposium, Tacoma, WA.
- <sup>+</sup>Moon-Nielsen, L. and C.H. Orr. 2010. Seasonal Variation in Hydrology driving

- shifts in Sources of Nitrate in an Agricultural Dominant Semi-arid watershed. H41E-1126 American Geophysical Union, Fall Meeting. San Francisco, CA.
- <sup>+</sup>Kelley, C.J., C.K. Keller, R.D. Evans, C.H. Orr, and J.L. Smith. Using nitrate N and O isotope ratios to identify nitrate sources and dominant nitrogen cycling processes in a 12 ha tile drained dryland agricultural field in the Palouse Basin of the Eastern Washington State. H41E-1127. American Geophysical Union, Fall Meeting. San Francisco, CA.
- \*Orr, C.H. 2010. Using Physical-Biogeochemical Linkages to Understand Fluvial Nutrient Processing at the Terrestrial Aquatic Interface. Symposium. Ecological Society of America, Annual Meeting, Pittsburgh, PA.
- Orr, C.H., Clark, J.J., P. R. Wilcock, and J.C. Finlay. 2007. Impact of channel geometry and periphyton growth on nutrient uptake and location of biogeochemical hotspots: Insights from a field-scale flume. Ecological Society of America, Annual Meeting, San Jose, CA.
- Orr, C.H., J.A. Riggsbee, D.M. Leech, and M. W. Doyle. 2006. Role of light in carbon release and iron sorption during simulated river sediment transport events. Ecological Society of America, Annual Meeting, Memphis, TN.
- \*Orr, C.H. and E.H. Stanley. 2005. Hydrologic Alteration and Response of Ecosystem Functions to River Restoration. In session: Scales of River Restoration and Ecosystem Response. American Geophysical Union, Fall Meeting. San Francisco, CA.
- Orr, C.H., E.H. Stanley, K.A. Wilson, and J.C. Finlay. 2005. Reintroduction of flooding and change in denitrification rates on a leveed Midwestern floodplain. AGU/NABS Joint Assembly meeting. New Orleans, Louisiana.
- Rogers, K.L., C.H. Orr, and E.H. Stanley. 2005. Spatial variability of denitrification and associated soil properties on a restored and a natural floodplain. AGU/NABS Joint Assembly meeting. New Orleans, Louisiana.
- Orr, C.H. and E.H. Stanley. 2005. Flow regime, ecosystem function and the 'field of dreams' in river restoration. Ecological Society of America/INTECOL. Montréal, Quebec.
- Orr, C.H., E.H. Stanley, K.A. Wilson, and J.C. Finlay. 2004. Changes in denitrification following reintroduction of flooding to a leveed Midwestern floodplain. Ecological Society of America. Portland, Oregon.
- Orr, C.H., K.L. Rogers, N.R. Lottig, and E.H. Stanley. 2004. Phosphorus uptake, channel geometry, and sediment size before and after small dam removal in Boulder Creek, Wisconsin. North American Benthological Society, Vancouver, British Columbia.
- Rogers, K.L., C.H. Orr, and E.H. Stanley. 2004. Algal and metabolic responses to dam removal in Boulder Creek, Wisconsin. North American Benthological Society, Vancouver, British Columbia.
- Stepenuk, C, C. Overdeest and C.H. Orr. 2004. Volunteer stream monitoring and local participation in natural resource issues. National Water Quality Monitoring Council Conference Chattanooga, Tennessee.
- Orr, C.H., Stanley, E.H., G.C. Cumming, M.W. Doyle, and H.A. Livingston. 2003. Geographic and temporal analysis of dam construction and removal in the State of Wisconsin. North American Benthological Society, Athens, Georgia.

- Orr, C.H., E.H. Stanley. 2002. Vegetation succession on former impoundments during the first 46 years following dam removal. American Society of Limnology and Oceanography, Victoria, British Columbia.
- Doyle, M.W., E.H. Stanley, C.H. Orr, A.R. Selle, and J.M. Harbor. 2002. Fluvial geomorphic controls on stream ecosystem processes: Insights from a synthesis of dam removals in Wisconsin. Binghamton International Geomorphology Symposium.

## **SELECT GRANTS AND FUNDING**

- NSF IUSE “ Bridging to STEM Excellence: Leveraging a Consortium of National STEM Education Initiatives to Improve Undergraduate STEM Teaching and Learning”. 2019. Orr Co-I. Lead PI: Rick Moog POGIL Project.
- NSF IUSE “Environmental Data Driven Inquiry and Learning”. Flexible classroom modules using publicly available, digital data for undergraduate students. 2018. Orr Co-I. Lead PI: Catherine O’Reilly Illinois State University.
- NSF RCN-UBE. “Course-based Undergraduate Research Network 2” expanding use of CUREs. 2017. Orr Co-I. Lead PI Erin Dolan University of Georgia.
- NSF LSAMP. “NorthStar STEM Alliance Program”. Providing faculty professional development on bridge programming for students from underrepresented groups. Sub award to SERC. Lead PI Michael Goh, University of Minnesota – Twin Cities.
- NSF Macrosystems “MSB-ECA: A macrosystems science training program: developing undergraduates’ simulation modeling, distributed computing, collaborative skills” 2017. Sub award to SERC. Lead PI Cayelan Carey Virginia Tech.
- NSF LSAMP “The Iowa Illinois Nebraska STEM Partnership for Innovation in Research and Education”. Increasing the number of STEM graduates from underrepresented groups. 2016. Sub award to Grinnell College and SERC. Lead PI: Diane Rover, Iowa State University.
- NSF IUSE. “Creating and Studying a National Network of Centers of STEM Education: Infrastructure for Educational Transformation.”2015. Sub-award to SERC. Lead PI Kacy Redd, APLU.
- NSF/USDA Water Sustainability and Climate -Category 3. “Watershed Integrated System Dynamics Modeling (WISDM): Feedbacks among biogeochemical simulations, stakeholder perceptions, and behavior.” 2012-2015. \$1,468,180. Orr lead PI 2012-2014.
- USGS 104b Program. Impacts of restoration activities on nutrient retention and cycling in salmon-bearing streams. 2014-2015. \$27,000. PIs A.K. Fremier and C.H. Orr.
- USGS 104b Program. Climate change implications for land-water transfer and in-stream fate of nitrogen. 2012-2013. \$27,000. PIs C.H. Orr, J. Harrison.
- NSF MRI. Acquisition of instrumentation to study stable isotopes of the carbon, nitrogen, and water biogeochemical cycles. 2009-2013. \$551,000. Lead PI A. Cousins. Co-Is R. D. Evans, C. K. Keller, G. Mount, and C. H. Orr.



Lake Osoyoos Drought Studies Report for the International Joint Commission 2009-2011  
\$150,000. Washington Department of Ecology through Washington Water  
Research Center, M. Barber, M. Beutel, C. H. Orr, B. Moore.

Minnesota Water Resources Center (USGS 104b). Determination of appropriate metric(s)  
for sediment-related total maximum daily loads. 2008-2009. \$32,000. A.  
Lightbody, C.H. Orr, J. Marr, P. Belmont, C. Paola.

## **COURSES TAUGHT**

Conservation Biology	St. Olaf BI/ES 226
Oceanography	WSU GEO 230
Introduction to Earth Systems Science	WSU ENVR 275
Sustainable Watersheds and Communities	WSU ENVR 290
Limnology: lecture and lab	UW- Madison ZOO 315/316
Stream Ecology	WSU ENVR 491
Ecosystem Ecology & Global Change	WSU BIO/ENVR 469/569
Nitrogen Cycling in Earth's Systems (team taught)	WSU GEO/ENVR/BIO 544
Undergraduate and Graduate Seminars	WSU ENVR and GEO

## **STUDENT ADVISING & MENTORING**

### Academic advising

Carleton College: 5 liberal arts students 2016-18

Washington State University: 20-25 Environmental Science majors per year 2009-14

### Undergraduate research students at WSU

Camden Nix	Environmental Science independent research 2013-14 "In-stream cold-season denitrification in a semi-arid Palouse stream".
Emily Gibson	Research intern with USDA 2013. Western Regional Plant Introduction Station. Germination study of <i>Carthamus tinctorius</i>
Skuyler Herzog	Honors College distinction 2011. "Determining potential for nitrate pollution removal by streams in a semi-arid watershed".
Elizabeth Aultman	Research intern with US EPA 2010. Thesis: "Review of methods for groundwater nitrate pollution mitigation".

### Multicultural Summer Research students at the University of Minnesota

Jordan Theissen, Lawrence University 2007, 2008

Alyxis Feltus Fond du Lac Tribal and Community College 2006

### Graduate advisees at WSU

Joe Parzych	MS Environmental Science, 2015. Thesis: "Impact of stream Restoration on nutrient retention in a salmon-bearing stream."
Leif Moon Neilsen	MS Environmental Science, 2013. Thesis: "Using stable isotopes to determine source and fate of nitrate in the semi-arid Palouse River watershed".

Julia Schwarz	MS Geology, 2013. Thesis “Magnitude and timing of nitrate export in a semi-arid dryland agricultural watershed”.
Brooke Clement	MS Environmental Science, 2012. Thesis: “Response of Reed Canary Grass to restoration methods in Eastern Washington”.
Katherine Tillotson	MS Environmental Science, 2010. “Restoration plan and curriculum for Palouse River restoration in Pullman, WA”.
Eric Brynstad	MS Environmental Science, 2010. “Teaching a ‘Middle Path’ to at-risk youth: Ecology education as cultural criticism”.
David Egerton	MS Environmental Science, 2010. “Water temperature mitigation at the Pend Oreille Mine, Metaline Falls, WA”.

### SELECTED OUTREACH & SERVICE

NAGT Professional Development committee	2019-current
NAGT Traveling Workshop Leader	2019-current
NSF Panelist and ad hoc reviewer: BIO, EHR	2010-2020
SEA Grant Virginia fellowship program reviewer	2020
Co-convener “Supporting Successful Transitions: Principles for students of all ages”. Earth Educator’s Rendezvous. Lawrence, KS.	2018
AAC&U PKAL Knowledge Xchange participant “Information for National Thought Leaders.” Washington D.C.	2018
Convener “Using Community-Built., Online Resources to Support Professional and Institutional Development in LSAMP Alliance Institutions” Workshop. Louis Stokes Midwest Center of Excellence.	2017
Convener “Working with your colleagues to affect change: Lessons from the InTeGrate STEP Center.” Workshop. Earth Educators’ Rendezvous	2017
AAC&U STEM Central Knowledge Xchange “Integrating the Research And Practice of Retaining Talented, Low Income Students in Undergraduate STEM “. Chicago, IL	2016
Convener “Teaching Science in Society: Building Relevance and Interest for Undergraduates By Adding InTeGrate Resources to Your Class” Workshop at the Ecological Society of America annual meeting	2016
NASA Grant Review Panelist	2015
GSA Session co-organizer “A showcase of undergraduate research in Hydrogeology”.	2015
USDA Agriculture and Food Research Initiative panelist	2013-2014
Advisory Committee, Stable Isotope Core Facility WSU	2012-2014
Academic Assessment Committee, WSU School of the Environment	2012-2013
GSA Session co-organizer “Streams and Aquifers: Integrating the physical and chemical”.	2013
WSU Honors College common reading program instructor	2011
WSU admitted students summer program advisor	2011
Executive Vice President, Society for Ecological Restoration, Northwest Chapter	2010-2011
AGU special session convener: “Experimental Rivers: New Facilities, New Observational Technologies, and New Questions (EP19)	2009

- North American Benthological Society special session co-organizer:  
“Integrating Biological/Biogeochemical Measurements with Complexity  
in Hydraulics and Geomorphology in Streams”. 2008
- AGU Meeting of Young Researchers in Earth Science (MYRES) co-organizer:  
“Dynamic Interactions of Life and its Landscape”. 2008

**MANUSCRIPT REVIEWER**

Ecology, Ecological Monographs, Ecosystems, Environmental Management, North  
American Journal of Fisheries Management, Hydrological Processes, Hydrobiologia,  
Journal of Environmental Studies and Sciences, International Journal of Limnology, Lake  
and River Management, Northwest Science, WIRE: Water

**PROFESSIONAL SOCIETY MEMBERSHIPS**

Ecological Society of America  
American Geophysical Union

Geological Society of America  
National Association of Geoscience Teachers