**CURRICULUM VITAE**

**Andrew** **J. Sanders**

**Contact Information:**

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**Education**

Doctoral Student at North Carolina State University (August 2015 - Current)

* Zoology Program, Dept. of Biological Sciences

Doctoral Student at Dartmouth College (September 2014 - August 2015)

* Ecology and Evolutionary Biology Program, Dept. of Biological Sciences

B.S. in Biology from University of Arkansas (August 2014)

* 3.4 GPA; 3.8 Biology GPA
* GRE scores: 165 Verbal (95th %ile), 157 Quantitative (69th %ile), 4.5 Writing (82nd %ile)

**Peer-reviewed Publications**

* Sanders, A.J. & Taylor, B.W.----. Effects of a diverse set of parasites on nutrient recycling by their hosts. *Freshwater Science*  **In Prep**
* Sanders, A.J. & LaVoie, M. ----. Climate change and trout on the Qualla Boundary. *Transactions of the American Fisheries Society.* **In Prep**
* Sanders, A.J. & Taylor, B.W. ----. Host diet stoichiometry influences transmission dynamics in whirling disease. *Ecology Letters*. **In Prep**
* Sanders, A.J. & Baumgardner, D.E. ----. Macroconsumer roles in benthic organic matter processing in an upland tropical stream of Costa Rica. *Journal of Tropical Ecology*. **In Review**
* Sanders, A.J. & Taylor, B.W. 2018. Using ecological stoichiometry to understand and predict infectious diseases. *Oikos*. **In Press \*editor’s choice\***
* Halvorson, H. M., J. T. Scott, A. J. Sanders, M. A. Evans-White. 2015. A stream insect detritivore violates common assumptions of threshold elemental ratio bioenergetics models. *Freshwater Science.* **34(2)**

**Professional Presentations**

* Sanders, A.J. & LeVoie, M. August 2018. Climate change and trout on the Qualla Boundary. Water in the Native World. Pablo, MT. (invited oral presentation).
* Sanders, A.J. & Taylor, B.W. May 2018. Host diet stoichiometry influences *Myxobolus cerebralis* production of infected *Tubifex tubifex*. Annual meeting of the Society for Freshwater Science. Detroit, MI. (poster).
* Sanders, A.J. & Taylor, B.W. June 2017. Host diet stoichiometry influences transmission dynamics in whirling disease. Annual meeting of the Society for Freshwater Science. Raleigh, NC. (invited oral presentation, best oral presentation in basic research).
* Sanders A.J. & Taylor, B.W. May 2016. Stoichiometric homeostasis in the oligochaete worm that is the invertebrate host of whirling disease. Annual meeting of the Society for Freshwater Science. Sacramento, CA. (poster).
* Sanders A.J. & Halloran, K. May 2014. It’s a Trap! Effects of salinity on *Utricularia gibba* (Lentibulaceae) feeding success. Joint Aquatic Sciences Meeting. Portland, OR. (poster)
* Sanders A J. & Baumgardner, D.E. May 2013. Macro-consumer roles in benthic organic matter processing in an upland tropical stream. Annual meeting of the Society for Freshwater Science. Jacksonville, FL. (oral presentation)
* Sanders A.J. & Baumgardner, D.E. October 2012. Macro-consumer roles in benthic organic matter processing in an upland tropical stream. Annual meeting of the Society for Advancement of Chicanos and Native Americans in Science (SACNAS). Seattle, WA. (poster)

**Awards and Academic Achievements**

* Travel Award, NCSU Student Fisheries Society, 2017
  + $300 to present at the 2018 Society for Freshwater Science meeting
* Best Oral Presentation in Basic Research, Society for Freshwater Science, 2017
  + $400 cash award, and registration fees for SFS2018
* NSF GRIP fellowship with USGS, CDC, & NPS, 2017
  + $5000 for travel and research expenses
* Fellowship, Native American Fish and Wildlife Society
  + $1000 for research expenses
* NCSU Graduate Diversity Enhancement Fellowship, 2016-2017
  + $1000
* Colorado Mountain Club Academic Fellowship, 2015
  + $1000 for research supplies
* NSF Graduate Research Fellowship, 2015
  + Annual stipend of $34,000 for 3 years
  + Annual cost of education allowance of $12,000 for 3 years
* Ford Foundation Pre-doctoral Fellowship, 2015
  + Annual stipend of $24,000 for 3 years
* GAANN Fellowship, U.S. Department of Education, 2014-2015 AY
* Study abroad scholarship, Organization for Tropical Studies, Fall 2013
  + $1,850 for fees
  + $5,150 for tuition and expenses
* Gillman study abroad scholarship, U.S. Department of State, Bureau of Educational and Cultural Affairs and the Institute of International Education (IIE); Fall 2013
  + $5,000
* Study abroad scholarship, University of Arkansas, Fall 2013
  + $600
* Travel grant to present at the annual meeting of the Society for Freshwater Science, University of Arkansas department of Biological Sciences; 2013
  + $150 for travel and expenses
* Instar Fellow, Society for Freshwater Science; 2013
  + $275 for registration
  + $350 for travel and Expenses
* SACNAS travel scholarship, SACNAS 2012
  + Travel and lodging expenses to present at SACNAS 2012
* Instar Fellow, Society for Freshwater Science; 2012
  + $200 for registration
* Chancellor’s List, University of Arkansas; spring 2012, fall 2012, spring 2013
* Dean’s List, University of Arkansas; spring 2012, fall 2012, spring 2013
* Best Research Project; NAPIRE 2012
* National Scholar, University of Arkansas; academic year 2011-2012

**Research Experience**

Laboratory Technician December 2010- August 2014: *Evans-White Stream Ecology Laboratory, University of Arkansas*

* Maintained experimental mesocosms, assisted with fieldwork, and analyzed insect and detrital chemistry. The research project I was most involved with involved feeding experimental diets, including diets labelled with radioisotopes to detritivorous insects and then analyzing their body chemistry to determine physiological characteristics such as assimilation and excretion rates, and nutritional homeostasis. Fieldwork involved collecting invertebrates and measuring environmental characteristics such as stream water chemistry, flow rate, and incident light.

Native American and Pacific Islander Research Experience for Undergraduates (NAPIRE), Summer 2012: *Las Cruces Biological Station, Costa Rica*

* Independently designed and executed an experiment investigating “the paucity of shredders” in tropical streams. I used electrical exclusion techniques to examine the role that macroconsumers such as fish and decapod crustaceans have on coarse benthic organic matter decomposition and leaf pack insect community structure in an upland tropical stream. I also compared the findings to those in similar studies at low elevation and in different regions of the tropics. I found that exclusion of macroconsumers had no effect on litter decomposition rates, but did result in greater abundance and diversity of insects within leaf packs. (Pub in prep)

EcoREU Research Experience for Undergraduates, Summer 2013: *Evans-White Laboratory, University of Arkansas*

* Integrally involved from conception to completion in a research project investigating Pycnopsyche lepida (Trichoptera: Limnephilidae) growth and digestive physiology responses to variation in diet C:P content. We found that P. lepida body C:P content can change with diet quality, as well as evidence that P. lepida may adjust feeding behavior to alter assimilation efficiencies of P and C in order to compensate for poor diet quality. We also examined how these results indicate fundamental flaws in the Frost et al. 2006 threshold elemental ratio model. My contributions included developing hypotheses, collecting specimens, culturing diets, maintaining experimental mesocosms, running samples for nutrient content, analyzing data, and helping to write the publication.

Research Assistant, August 2014 – Present: *Taylor Laboratory, Rocky Mountain Biological Laboratory, Dartmouth College, & North Carolina State University*

* My research in the Taylor lab is at the intersection of ecological stoichiometry and disease ecology. My central question is “How does the balance (or imbalance) between hosts’ nutritional needs and their diets influence disease dynamics?”. Preliminary work has included sampling biofilm and invertebrates from alpine streams in Western Colorado for their elemental stoichiometry, and feeding experiments analyzing the nutritional homeostasis of Tubifex tubifex, the reproductive host of the pathogen responsible for Whirling disease in Salmonid fishes. I am also building a dataset of pathogen effects on host nutrient recycling and stoichiometry. I am also working with the Eastern Band of Cherokee Indians to explore how climate change will impact the tribe’s native and hatchery raised trout fisheries.

GRIP Intern, September 2017 – Present: *USGS Wyoming-Montana Water Science Center*

* I helped test robotic equipment and new analytical techniques for monitoring invasive species using eDNA, as part of an effort to determine their suitability for application at USGS stream gauging stations. I also performed my own research regarding the transport of pathogenic microbes in lotic environments, which involved collecting samples from Yellowstone NP’s Boiling River, and analyzing those samples with qPCR. This work is ongoing.

**Teaching Experience**

Ecology, Fall 2014: *Teaching assistant for Dr. Rebecca Irwin, Dartmouth College*

* Led weekly lab section that was a co-requisite of intro to ecology lecture. This included beginning each lab with a short lecture, as well as leading undergraduates into the field to collect samples, showing them how to analyze samples in the lab, and helping them develop their scientific writing skills. I also graded exams and manuscripts.

Biostatistics and Experimental Design I, Winter 2015: *Teaching assistant for Dr. Kathryn Cottingham, Dartmouth College*

* Led weekly lab section that was a co-requisite for the biostats I lecture. This included beginning each lab with a short lecture, recapping what was taught in class, and then helping students work through assignments were they used their judgement to perform and interpret statistical analyses on real world data from the fields of ecology and epidemiology. I also helped students develop their ability to communicate and draw conclusions from the results of scientific research. I also helped conduct classroom lectures and exercises, and graded assignments and quizzes.

**Outreach and Professional Service**

* Mentor to Pollard Middle School Envirothon students
* Reviewed manuscripts for Freshwater Science, Oecologia, and Limnology & Oceanography
* Student Chair of the Society for Freshwater Science

AY 2017-2018

* Mentored an REU student who carried out their own project under my supervision at the Rocky Mountain Biological Laboratory.

Summer 2016

* Student Chair of the Society for Freshwater Science Student-Mentor Mixer committee

AY 2016-2017

* Student Chair of the Society for Freshwater Science Diversity and Education committee AY 2016-2017
* Treasurer of NCSU Zoology Graduate Student Association

2016 - 2017

* Mentored undergraduate students from underrepresented groups at annual meeting of the Society for Freshwater Science in Sacramento, California, through INSTARS mentoring program. May 2016
* Gave presentation on my research and a hands-on tour of the research facilities at the Rocky Mountain Biological Laboratory as part of their “Geek Week” outreach program.

2015, 2016

* Guest lectured high school students in Spring 2014 on tropical ecology and pursuing careers in science during college.
* Mentored undergraduate students from underrepresented groups at the Joint Aquatic Sciences Meeting in Portland, Oregon, through the Society for Freshwater Science INSTARS mentoring program.
* Volunteered for “Brain Buzz” at the Uppery Valley Food Coop in White River Junction, VT, communicating my research to the local community.

**References**

Dr. Brad Taylor

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