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Addien C. Wray

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Objective

To work actively toward a Ph.D. in biogeochemical research, focusing on understanding microbial community structure and responses to geochemical variation, with specific relevance to contributing to the growing field of Astrobiology.

Education

University of Washington September 2016 - Present
Graduate Research Assistant, Earth and Space Sciences

University of California, Berkeley GPA: 3.42
B.A., Marine Science (with Honors) December 2014
B.A., Integrative Biology December 2014
Honors Thesis: "Microbial Metabolic Activities Under Serpentinizing Conditions: A Microcosm Experiment"

Skills

Lab: Gas chromatograph (reducing gas analyzer, flame ionization detector) operation and maintenance, thin layer chromatography, solid phase extraction, DNA extraction, compressed gas handling and use, mercury vacuum operation, glassware sterilization, microscopy (dissecting, petrography, simple/compound), serial dilution, centrifuge use, syringe and hypodermic needle use

Field: Conductivity Temperature and Depth (CTD) instrument operation, Electrofisher use, North American bird, mammal, and vegetation identification, point-count surveys, transect and quadrat use, backpacking, orienteering, stream cross-section profiling, beat sheet/pitfall trap/netting insect-capture techniques, densiometer/clinometer/GPS use, experienced swimmer/snorkeler/free diver

Computer: MATLAB, R, Excel

Research Experience

Power Lab **UC Berkeley** **August – October 2015**
Research Assistant
Assisted graduate student Keith Bouma-Gregson on his metagenomic study of algae in the Eel River. Duties included collection of algal biomass, preparation of samples for liquid chromatography and mass spectrometry, solid phase extraction of cyanotoxins, and DNA extractions.

Eel River Critical Zone Observatory **UC Berkeley** **September 2015**
Research Assistant
Assisted with Stage 4 analysis of the Eel River ecosystem, in accordance with the NSF-CZO guidelines. Conducted surveys of fish, aquatic invertebrates, and abiotic river conditions along four sections and tributaries of the Eel River.

Carlson Lab **UC Berkeley** **August 2015**
Research Assistant
Surveyed steelhead salmon populations to understand residency in pools co-inhabited with migratory and resident populations. Duties included operation of electrofisher, capture of fish, and assistance measuring fish, injecting PIT tags, and documenting recapture rates.

Brittingham Lab **Pennsylvania State University** **May – August 2015**
Field Technician
Conducted point-count surveys on neotropical migrant and resident bird species, and quantified present vegetation, in central Pennsylvania.

Hoehler Lab **NASA-Ames Research Center** **2011 – 2014**

Student Researcher *July 2014 – December 2014*

Capped work from 2011 and 2012 by expanding that research into an honors thesis, collaborating with an advising professor at UC Berkeley. Subsurface gases and well water were sampled from the same system as in 2011 and 2012 and two additional microcosm experiments were performed, again using a reducing gas analyzer (RGA) and a flame ionization detector (FID) gas chromatograph (GC) to track changes in gas concentrations.

To corroborate the data from 2011, each microcosm included artificially anaerobic and aerobic samples.

Samples were also prepared for organic acid, ion concentration, and DNA analyses.

Researcher in Biogeochemistry *June 2012 – August 2012*

The wells sampled in 2011, with an additional eight wells, were resampled for dissolved gases and well water. Two parallel microcosm experiments were performed, to determine if oxygen is required for any observed metabolisms. The dissolved gases and those used in the microcosms were measured with RGA and FID GC's.

The work done in California was expanded to include additional extremophiles in the hot springs at Yellowstone, via collaboration with professors from Montana State and the University of Montana. Hot springs in Yellowstone were sampled for dissolved gases and microbial biomass, and microbial consumption rates of H_2 and CO_2 were tested. Other duties included operation, maintenance, and repair an RGA GC, and reduction and analysis of data.

Additional RGA and FID GC work included analysis of gases samples from serpentinizing systems in Iceland.

Intern in Biogeochemistry *May 2011 – July 2011*

Helped establish a subsurface microbial observatory in a serpentinizing system in California by quantifying natural abundance of subsurface dissolved gases and establishing the role those gases play in the metabolisms of *in situ* microbial life. The latter was done through a microcosm experiment, and gases concentrations for both were measured with RGA and FID GC's.

UCB Moorea Class **UC Berkeley** **August – December 2013**

Student Researcher

Developed a field-based project on local avifauna, conducted point-count surveys of birds in urban, swampy, and forested habitats, communicated and worked with locals to access sites, performed statistical analysis of data, presented results in a public forum, and published results in a University of California journal (see Publications).

Bishop Lab **UC Berkeley** **January 2012 – August 2013**

Intern

In support of the NSF-CZO project, designed and implemented a novel method for sampling subsurface dissolved gases in a riparian zone, analyzed samples on RGA and FID GC's, reduced data and performed statistical analysis, presented results to faculty and post-doctoral fellows.

Undergraduate Research Assistant

Supported research into the role of detritus in oceanic carbon cycling, with an emphasis on diurnal variations. On 5 research expeditions in the Pacific, operated CTD rosette system, filtered seawater samples to sample for PIC/POC, and deployed automated PIC/POC collection instruments.

Suding Lab **UC Berkeley** **August 2012 – May 2013**

Undergraduate Research Assistant

Identified and catalogued seeds of rangeland CA grass species to examine success of native versus invasive species, and monitored mycorrhizal fungi growth.

General Biology Field Section **UC Berkeley** **August – December 2011**

Student Researcher

Designed and implemented an independent research project to characterize arthropod community structure. Presented results in a forum with Integrative Biology faculty and the public.

Publications & Presentations

Wray, Addien. "Avian Community Structure: Land Use Impacts on Beta Diversity and Species Richness in Three Distinct Habitats on Moorea, French Polynesia." UCB Moorea Class: Biology and Geomorphology of Tropical Islands. 2013.

Wray, Addien; Kubo, Michael; Bolser, Diana; Hoehler, Tori. "Carbon Monoxide and its Role in Subsurface Anaerobic Metabolisms." Poster Symposium, Astrobiology Science Conference. Atlanta, Georgia. April 2012.

Memberships

Ecological Society of America (Student Section)

Awards

Charles H. Ramsden Travel Grant	2012
Dean's Honors	2012, 2013
Charles H. Ramsden Research Grant	2013
UW Graduate School Fund for Excellence and Innovation Top Scholar Award	2016
UW Astrobiology Scholar Award	2016
Achievement Rewards for College Scientists (ARCS) Foundation Fellow	2016-2019