

ADDIEN WRAY

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Department of Earth and Space Sciences, Johnson Hall, 4000 15th Avenue NE, Seattle, WA 98195

EDUCATION

University of Washington

2016 - Present

Ph.D. Candidate, Earth and Space Sciences and Astrobiology

Advisor: Drew Gorman-Lewis, Associate Professor

University of California, Berkeley

2010 - 2014

B.A., Marine Science (with Honors) and Integrative Biology

Advisors: Prof. James Bishop; Dr. Tori Hoehler

Honors Thesis: "Microbial Metabolic Activities Under Serpentinizing Conditions"

APPOINTMENTS

University of Washington

2016 - Present

Ph.D. Candidate

Seattle, WA

- Dissertation on thermodynamics of interactions between heavy metals, nitrogen, and microorganisms, both metabolically and through surface interactions.
- Specific work involves the bioenergetics of heavy metal reduction and nitrogen fixation, as well as bacterial surface chemistry and the thermodynamics of metal adsorption onto bacterial surfaces.
- Additional work includes the examination of symbiotic and parasitic prophages in SAR11 bacteria.

UC Berkeley

August - October 2015

Research Assistant, Power Lab

Berkeley, CA

- Assisted graduate student Keith Bouma-Gregson on his metagenomic study of algae in the Eel River.

UC Berkeley

September 2015

Research Assistant, Eel River Critical Zone Observatory

Berkeley, CA

- Assisted with Stage 4 analysis of the Eel River ecosystem, in accordance with the NSF-CZO guidelines.

NASA-Ames Research Center

2011 - 2014

Intern, Exobiology Branch - Hoehler Lab

Mountain View, CA

- 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.
- Examined extremophiles in the hot springs at Yellowstone, through collaboration with researchers from Montana State and the University of Montana.
- Capped work from 2011 and 2012 by expanding that research into an honors thesis.

UC Berkeley

2011 - 2012

Research Assistant, Bishop Lab

Berkeley, CA

- 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.

- 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.

PUBLICATIONS

- Wray, Addien & Gorman-Lewis, Drew. Bioenergetics of aerobic growth by *Shewanella putrefaciens* strain CN32. **Abstract.** Geological Society of America Annual Meeting, Session 15 - T125: New Voices in Geobiology. Portland, OR. 2021.
- Wray, Addien & Gorman-Lewis, Drew. Geochemical effects on the adsorption of uranium onto *Shewanella putrefaciens* CN32. **Abstract.** American Chemical Society Fall Meeting. San Diego, CA. 2019.
- Wray, Addien & Gorman-Lewis, Drew. A Thermodynamic Description of Microbial U(VI) Reduction. **Abstract.** Goldschmidt Geochemistry Conference, Session 10m: Microbial Interactions with Minerals and Metals. Boston, MA. 2018.
- Wray, Addien; Kubo, Michael; Bolser, Diana; Hoehler, Tori. Carbon Monoxide and its Role in Sub-surface Anaerobic Metabolisms. **Abstract.** Poster Symposium, Astrobiology Science Conference. Atlanta, Georgia. April 2012.

PUBLICATIONS IN PREPARATION

- Submitted:** Wray, Addien & Gorman-Lewis, Drew. Thermodynamic and spectroscopic investigations of *Shewanella putrefaciens* CN32 cell envelope
- Wray, Addien & Gorman-Lewis, Drew. Surface complexation and thermodynamic properties of U(VI) adsorption onto *Shewanella putrefaciens* CN32
- Wray, Addien & Gorman-Lewis, Drew. Bioenergetics of aerobic- vs. metal-based metabolism by *Shewanella putrefaciens* CN32
- Wray, Addien & Gorman-Lewis, Drew. Energetics of Methanocaldococcus sp. FS406-22 while doing N-fixation and with pre-fixed N

PROFESSIONAL PRESENTATIONS

- Wray, Addien & Gorman-Lewis, Drew. Protonation properties of surface functional groups on *Shewanella putrefaciens* strain CN32. Oral Presentation. UW ESS Research Gala. 2021.
- Wray, Addien & Gorman-Lewis, Drew. Geochemical effects on the adsorption of uranium onto *Shewanella putrefaciens* CN32. Oral Presentation. UW ESS Research Gala. 2019.
- Wray, Addien & Gorman-Lewis, Drew. Competitive Fe(III) and U(VI) Reduction by *Shewanella putrefaciens* CN32: A Thermodynamic Perspective. Poster. UW ESS Research Gala. 2018.
- Wray, Addien & Gorman-Lewis, Drew. Strange Diets: A Thermodynamic Description of Microbial U(VI) Reduction. Poster. UW Research Gala. 2017.

FELLOWSHIPS AND AWARDS

- 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)
- Inquisitive Graduate Student Fund Awardee, UW ESS (2017, 2019, & 2021)
- Best Overall Poster, UW ESS Research Gala (2018)
- Richard E. Fuller Endowed Fund Awardee, UW ESS (2018)
- Peter Misch Fellowship, UW ESS (2019, 2020, & 2021)
- Stephen G. Warren Endowed Fund for Graduate Students in ESS Awardee, UW ESS (2020)
- Best Geochemistry Talk, UW ESS Research Gala (2021)

TECHNICAL STRENGTHS

Computer Languages	Python, R, Matlab, Octave
Geochemistry	Calorimetry, Potentiometry, Gas chromatography, Spectrophotometry, Two-phase separation, FTIR
Microbiology	Anaerobic culturing, Biomass harvesting, Fluorescence microscopy, Flow cytometry