Grayson Boyer

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EDUCATION

ARIZONA STATE UNIVERSITY
PhD in Biochemistry
May 2018 | Tempe, AZ
Cum. GPA: 4.0

WASHINGTON STATE UNIV.
BS in Biochemistry
May 2010 | Pullman, WA
Summa cum laude

LINKS

Home:// **gmboyer.github.io**
Github:// **gmboyer**
LinkedIn:// **grayson-boyer**

CAREER PROFILE

I am interested in applying my experience in data science, coding, and chemistry to projects in industry or academia. As a part of my PhD research, I have worked extensively with environmental, chemical, and thermodynamic datasets interpreting patterns, preparing visualizations, and advising action based on results. I also enjoy competing in Kaggle data science competitions, tackling mini-coding projects, baking, jogging, and playing tabletop games with friends.

SKILLS

DATA
Confidence intervals • Data cleanup • Decision trees • K-means and hierarchical clustering • Machine learning • Natural language processing • Ordination with PCA and NMDS • Regex • Regression • Text mining • Visualization • Web scraping

MODULES AND PACKAGES
dplyr • ggplot2 • Jupyter • numpy • pandas • scikit-learn • textblob • beautifulsoup • plotly

LANGUAGES
R • Python • LaTeX • SQL

RESEARCH AND EXPERIENCE

ENKI PROJECT | Postdoc Researcher and Developer
May 2018 - Present

- Curated and maintained the public SLOP16 database containing thermodynamic properties of 2,000+ chemical species.
- Developed software tools for mining and managing large geochemical datasets, automating calculation of water sample chemical properties, and visualizing results from 2500+ output files.
- Developed software tools for scraping properties of organic molecules from online databases and calculating aqueous thermodynamic properties with group additivity theory.
- Developed software for calculating thermodynamic properties of aqueous inorganic complexes.
- Provided high-level tutorials for the use of free geochemical software tools available on the ENKI JupyterHub server.

ARIZONA STATE UNIVERSITY | Research & Teaching Asst.
Aug 2010 – May 2018 | Tempe, AZ

- Performed statistical analyses and visualization of environmental lipid abundance data across 30+ sample sites using a self-curated database of 3,500+ lipid structures.
- Compared observed environmental lipids and concurrent geochemical measurements to generate hypotheses regarding lipid energetic cost and function.
- Led workshops introducing R and the CHNOSZ thermodynamic package to students and faculty (2011-2017).
- Mentored an undergraduate lab research assistant (2013-2014).
- Co-chaired the session "Reaction Kinetics, Thermodynamics, and Habitability" at the Astrobiology Science Conference in Mesa, AZ, on Apr 27, 2017.

GRANTS AND FELLOWSHIPS

- NASA Exobiology | Mar 2016 | $852,865
  "Geochemical and Biomolecular Changes at the Transition to Photosynthesis"
- NASA Astrobiology Institute Grant | Apr 2013 | $10,758
  "How do environmental C:N ratios influence C:N ratios of lipid biomarkers?"
- Arizona State Univ. Grad. Research Fellowship | Aug 2010 | $19,000

PUBLICATIONS

- **Boyer, GM**, Schubotz, F, Summons, R, Woods, J, Shock, EL (2018) Thermophile lipid oxidation state suggests bioenergetic favorability of alkyl chain modification along temperature and redox gradients. (Submitted, in review)
- **Boyer, GM**, and Shock, EL. Thermodynamic favorability of thermophile lipid chain modifications across a temperature and redox gradient. (Forthcoming)
- Shock, EL, Canovas, P, Yang, Z, **Boyer, GM**, Johnson, K, Robinson, K, Fecteau, K, Windman, T, Cox, A (2013) Thermodynamics of organic transformations in hydrothermal fluids. *Reviews in Mineralogy and Geochemistry*, 76(1): 311-350.
- Schulze-Makuch D, Méndez, A, Fairén, AG, von Paris, P, Turse, C, **Boyer, GM**, Davila AF, Resendes de Sousa António, M, Catling D, Irwin LN (2011) A two-tiered approach to assessing the habitability of exoplanets. *Astrobiology*, 11(10): 1041-1052.