

Grayson Boyer

gmboyer@asu.edu | 480.848.1504

PhD candidate with a quantitative biogeochemistry background
seeks career in data science.

EDUCATION

ARIZONA STATE UNIVERSITY

PHD IN BIOCHEMISTRY

Expected Apr 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](https://github.com/gmboyer)

LinkedIn:// [grayson-boyer](https://www.linkedin.com/in/grayson-boyer)

Twitter:// [@gmboyer](https://twitter.com/gmboyer)

SKILLS

DATA

Confidence intervals • Decision trees •
Detrended correspondence analysis •
K-means and hierarchical clustering •
Discriminant analysis • Monte Carlo
simulations • Nonmetric multidimensional
scaling • Principal component analysis •
Regex • Regression • Text mining •
Visualization

LANGUAGES

R • Python • \LaTeX • basic SQL

SOFTWARE

Agilent Masshunter • EQ3/6 • Jupyter
Notebooks • Mathematica • Microsoft
Excel • SUPCRT92

SELECTED COURSEWORK

Computational Chemistry
Theoretical Geochemistry
Quantitative Biochemistry

RESEARCH AND TEACHING

ENKI PROJECT | DEVELOPER AND EDUCATOR

May 2017 - Present

- Developed three Python and R Jupyter notebooks to automate geochemical data cleanup, calculate properties of water samples with 50+ geochemical variables, and datamine scientifically valuable results from thousands of output files.
- Provided high-level tutorials in the use of free geochemical software tools as a part of an NSF-funded **EN**abling **K**nowledge **I**ntegration (ENKI) initiative.
- Automated complex quality control calculations for environmental water samples, reducing task time from weeks to moments and allowing easy statistical post-analysis of results.

GEOPIG | RESEARCH ASST. & TEACHING ASST.

Aug 2010 - Expected Apr 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 multiple workshops introducing R and the CHNOSZ thermodynamic package to students and faculty (2011-2017).
- Curated and ensured quality control of the SLOP16 open source database containing thermodynamic properties of 2,000+ chemical species.
- 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, and Shock, EL. Thermodynamic favorability of thermophile lipid chain modifications across a temperature and redox gradient. (Forthcoming, 2018)
- Boyer, GM, Schubotz, F, Woods, J, Shock, EL (2018) Thermophile lipid oxidation state suggests bioenergetic favorability of alkyl chain modification along temperature and redox gradients. (In preparation)
- 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.