**Kelsey Crutchfield-Peters Dawson Lab, Department of Integrative Biology**

[kcrutchfieldpeters@berkeley.edu](mailto:kcrutchfieldpeters@berkeley.edu) 4007 Valley Life Sciences Building

University of California, Berkeley, CA, USA 94720-3160

**Education**

**PhD Candidate in Integrative Biology**, University of California, Berkeley (estimated: 2023)

Working Title: “Nitrogen sourcing and cycling within a deeply weathered bedrock rhizosphere and its role in plant nutrient ecology”

Advancement to candidacy: October 18, 2018

Graduate Student GPA: 3.905

**Bachelor of Science in Biology**, *Cum Laude*,The University of Puget Sound, Tacoma, WA

May 2014, GPA: 3.78/4.00

**Publications**

T.E. Dawson, Hahm, W. J. and **Crutchfield-Peters, K. L.** (2020) Digging Deeper: what the critical zone perspective has to offer to the study of plant ecophysiology. *New Phytologist* 226: 666–671

**Publications (in prep)**

**Crutchfield-Peters, K. L.**, Rempe, D.M., Tune, A.K., and Dawson, T.E. “Forest rhizospheres extend carbon and nitrogen cycling meters below the base of soil into weathered rock” (in prep)

**Selected Talks and Posters**

*Invited Talks*

* + **Department of Integrative Biology Seminar (September 2022):** *“Forest rhizospheres drive linked carbon and nitrogen cycling meters below the base of soil”*
  + **Guest Lecture at University of Puget Sound (Spring 2018 and 2020*)*** in the course “Biogeochemical Approaches to Environmental Science”
  + **Guest Lecture at San Francisco State University (March 18, 2021)** in the course “Introduction to Environmental Science,” topic: Global Biogeochemical Cycles
  + **Speaker for Botany Lunch Seminar in Integrative Biology at** University of California, Berkeley(November 2019) "*From soil to saprolite: nitrogen cycling and plant uptake in a seasonally dry forest underlain by a thick unsaturated zone*"
  + **Invited Speaker at 22nd Annual Murdock Undergraduate Research Conference** Vancouver, WA (2014): *“A stable isotope approach to understanding carbon cycling in*

*prairie soils*”

*Conference Presentations*

* + Kelsey Crutchfield-Peters, Alison K. Tune, Danielle M. Rempe and Todd E. Dawson(December 2020) **Annual American Geophysical Union Conference** (Virtual): “*Nitrogen cycling beneath the soil: bioavailable nitrogen dynamics in a bedrock rhizosphere*” Poster
  + Kelsey Crutchfield-Peters, Alison K. Tune, Danielle M. Rempe and Todd E. Dawson

(August 2020) **Ecological Society of America Conference** (Virtual): “*Dynamic*

*bioavailable N in a deep unsaturated zone shows evidence of N cycling and potential*

*plant and microbe use*” Poster

* + Kelsey Crutchfield-Peters and Kena Fox-Dobbs (2013) **Geological Society of America Annual Meeting** (Denver, CO) “*Nitrogen in folios lichen: using biogeochemical approaches to examine NOx deposition in Parmelia spp. near major roadways*” Poster

**Grants, Fellowships and Awards**

**Grants and Fellowships in Support of Research**

**NSF Graduate Research Fellowship Program (GRFP; $138,000) April 2018-Spring 2020**

Awarded in support of dissertation research on nitrogen cycling in bedrock rhizospheres

**Carol Baird Graduate Student Award for Field Research ($17,000) September 2017**

Awarded to support two years of dissertation field research at the ERCZO

**Sonoma Mycological Association Graduate Research Scholarship ($1,000) July 2017**

Scholarship to support study of nutrient uptake in conifers facilitated by mycorrhizae

**Thomas J. Watson Fellowship ($28,000) June 2014-July 2015**

Fellowship for one year of international travel to study community-based conservation and natural resource management in Borneo, New Zealand, Chile, Ecuador and India

**McCormick Research Grant** **($5,590**) **May 2013**

Awarded $3,750 personal stipend, $1,840 research stipend to conduct undergraduate thesis research

**Grants in Support of DEI Initiatives**

**Grant to Support IB Research Mixers ($15,000) May 2022**

Co-author on grant to support programming aimed at connecting undergraduates from underrepresented backgrounds in STEM to research mentors. Funding through UC Berkeley Life Sciences Initiative to Advance Faculty DEIB

**DEI Small Grant to Support IB Research Mixers ($3,000) July 2021**

Co-lead on program to support programming aimed at connecting undergraduates from underrepresented backgrounds in STEM to research mentors.

**Awards**

**Outstanding Graduate Student Instructor Award March 2022**

**Relevant Research Experience**

***University of California, Berkeley June 2016-present***

**Dissertation Research:** Eel River Critical Zone Observatory

I combine soil biogeochemical analyses and plant ecophysiology to monitor N cycling and plant uptake to answer the following questions through observational and experimental field studies: (1) how do the chemical forms and concentrations of biologically available N change year-round in weathered bedrock; (2) what is the source and fate of this N; and (3) to what extent do dominant tree species utilize N stored within weathered bedrock?

**Graduate Student Researcher:** Eel River CZO **January 2018-present**

Conducted soil nutrient analyses, water geochemical analyses, vegetation sampling as

part of on-going research at ERCZO. Collaborator in research using novel Vadose Zone

Monitoring System at ERCZO

***University of Puget Sound February 2013-May 2014***

**Undergraduate Senior Thesis**: *“Belowground Respiration of added C4 carbon to Washington*

*prairie soils”* Presented at Murdoch Undergraduate Research Conference 2014

**Independent Research Spring 2013**: *“Nitrogen in folios lichen: using biogeochemical*

*approaches to examine NOx deposition in Parmelia spp. near major roadways”* Presented at GSA Conference 2013

**Independent Research** **Fall** **2012**: Defensive behaviors in clonal and solitary individuals of the

aggregating sea anemone (*Arthropleura elegantissima*), in completion of the course

Marine Biology

**Field Research Assistant for Palaeoecological Study of C4 Grassland Expansion Summer 2013, 2014:**University of Puget Sound/University of Wyoming/Meade Basin NSF Project

**Docent and Small Mammal Specimen Preparator Spring 2014**

Slater Museum of Natural History, Tacoma, WA

**Service and Professional Development**

**Integrative Biology DEI Committee** **Member Fall 2019-Spring 2022**

**Integrative Biology Research Mixer** **Organizer Fall 2021-September 2022**

Co-leading regular events aimed at connecting undergraduates from underrepresented

background in STEM to graduate research mentors and to foster community in IB

**Pilot Program Summer Undergraduate Research Experience (SURE) Program** **Present**

Serve as an advisor for program aimed at providing research opportunities to recent post-grads from underrepresented background in STEM as a pipeline to graduate school

**NSF BURET mentorship workshop Summer 2021**

Four-week NSF funded undergraduate mentorship workshop

**D-Lab R Bootcamp Series Fall 2020**

**Fundamentals of Ecosystem Ecology at the Cary Institute** (2 week intensive short course) Millbrook, NY 2017

**Isocamp, University of Utah** (2 week intensive short course), Salt Lake City, UT 2018

**Mentoring and Teaching Experience**

**Undergraduate Research Apprentice Program (URAP) Mentor Spring 2021-Present**

University of California, Berkeley

* I have mentored URAP students for a total of approximately 16 hours per week since Spring 2021 in laboratory and field methods in critical zone research

**Mentor to Undergraduate Thesis Research Students Fall 2020-Present**

University of California, Berkeley

* Currently supervising two senior thesis projects: Laura Powers (SURF awardee; soil microbial community shifts pre and post fire); Angie Wu (SPUR awardee; concomitant impacts of nitrogen and water limitation on Douglas fir); and one past student, Niklas Blanadet (Spring 2020-Spring 2021) who went on to accept several jobs in research and is now working at Lawrence Berkeley National Lab.

**Graduate Student Instructor, Plant Physiological Ecology Spring 2020, Spring 2022**

University of California, Berkeley

* Led laboratory instruction in plant ecophysiological methods, use of stable isotope methods, etc.
* Mentored students in independent research projects including: proposal writing, experimental design, sample collection, statistical analysis and write-up

**Graduate Student Instructor, Ecosystems of California Fall 2021**

University of California, Berkeley

Taught students to ID Family/Genus/Species of ~160 species of native CA plants, natural history of CA

**Graduate Student Instructor: Biology 1B Fall 2016/Spring 2017/Fall 2017**

University of California, Berkeley

Three semesters as a laboratory instructor in introductory biology for three semesters at

UC Berkeley

**Introductory Biology Lab Undergraduate TA (BIO 111) Aug-Dec 2013**

University of Puget Sound, Tacoma, WA

Assisted in laboratory lesson instruction, conducted laboratory prep

**Introductory Biology Lab Undergraduate TA (BIO 101) Jan-May 2013**

University of Puget Sound, Tacoma, WA

Assisted in laboratory lesson instruction, conducted laboratory prep

**Relevant Skills**

* Proficient in Data Analysis in R
* Proficient in Spanish
* Strong Oral Communication Skills
* Strong Writing Communication Skills

**Relevant Coursework**

**Graduate Coursework**

**University of California, Berkeley**: • Plant Physiological Ecology • Ecosystem Ecology • Transit Time Modeling in Hydrology Seminar • Evolution • Isotopics Seminar • Chemistry of Soils • Geomorphology (audit) • Plant Systematics (audit) • Geochemistry (audit)

**Undergraduate Coursework**

**University of Puget Sound**: Plant Physiology • Field Botany • General Ecology • Biogeochemical Approaches to Environmental Science • Marine Biology • Comparative Animal Physiology • Organic Chemistry

**Research Assistants and Mentees**

Angie Wu – Senior Thesis Student (present)

Laura Powers – Senior Thesis Student (present)

Kaite Horvath – URAP (present)

Asiah Giuntoni – URAP (present)

Mielle Lee – Field and Lab Technician (present)

Brianne Roxbrough – URAP (Fall 2021-Spring 2022)

Evan Shi – Laboratory Assistant (Spring 2022)

Hunter Jamison – Field Technician (Summer 2019-Summer 2022)

Maryn Sanders – Field Technician (Summer 2020-Summer 2021)

Gunnar Rieth – Field Technician (Summer 2019-Spring 2021)

Will Speiser – Field Technician (Summer 2018-Summer 2019)

Olivia Parra – URAP, full-time paid field assistant (Spring-Summer 2021)

Niklas Blanadet – Senior Thesis student (Fall 2020-Spring 2021)

Alexandra Carey – Full-time paid field assistant and Laboratory Assistant (May-Oct 2020)

Emma Sevier – Visiting Student (Summer 2019)

Hannah Johansson – Field and Laboratory Assistant (Summer 2019)

Saumitra Kelkar – Field and Laboratory Assistant (Summer 2018-Spring 2019)

Liberty Onia – Laboratory Assistant (Spring 2018)

**Volunteers**: Carolyne Stoffel, Caroline Combs, Alex Vergara, Mariel Nelson