

# TOBY MAXWELL

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## CAREER OBJECTIVES

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To apply my expertise as an environmental scientist to address basic and applied research questions surrounding land use and management to promote environmental health in support of the well-being of the land, and the needs of our society.

## EDUCATION

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### University of California, Davis

March 2018

*Ph.D. Agricultural and Environmental Chemistry*

Dissertation Title: Advancing molecular to regional understanding of carbon-water relations in managed and natural systems across California

### State University of New York, Geneseo

May 2011

*B.S. Chemistry, Magna Cum Laude*

## EXPERIENCE

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### University of Oregon

1, April 2018 - Present

*Title: Post Doctoral Scholar*

*Supervisor: Prof. Lucas Silva - lsilva7@uoregon.edu, 530-601-0401*

*Project 1: Using soil-plant relationships to map changes in Oregon's treeline forest productivity*

*Project 2: Evaluating how soil-plant interactions drive nutrient cycling in Pacific NW grasslands*

- Developed research program covering the full research cycle to study ecosystem ecology across Oregon. Study of background literature, determining appropriate experimental design to collect soil/plant samples. Linking site to ecosystem scale ecological properties to multispecies interactions.
- Data acquisition and analysis to link spatial and temporal trends in climate, soils, plant communities.
- Statistical analysis using R for multivariate modeling and ArcGIS to design field experiments.
- Report writing, publication in peer-reviewed outlets, presenting at professional scientific meetings.

### University of Oregon

1, April 2018 - Present

*Title: Lab Manager*

*Supervisor: Prof. Lucas Silva - lsilva7@uoregon.edu, 530-601-0401*

- Responsible for running and maintaining lab instruments, writing standard operating procedures, and coordinating training of new users.
- Teaching statistical analysis using R, providing guidance in experimental design, data acquisition, lab techniques to students.
- Develop QA/QC protocols, manage ordering of lab materials, and coordinate safety training.

### University of California, Davis

1, October 2012 - 31, March 2018

*Title: Graduate Student*

*Supervisor: Prof. Will Horwath - wrhorwath@ucdavis.edu, 530-754-6029*

*Project 1: Using species composition and soil properties to predict shifts in forest carbon-water relations*

*Project 2: Identifying drivers of shifting productivity in common wheat across California*

- Experimental design, data acquisition for soil and plant collection across land-use and natural gradients.
- Acquired, organized, and analyzed large datasets, developed QA/QC procedures for data integrity.
- Performed statistics, GIS analysis, statistical modeling, and data visualization of multispecies interactions for peer-reviewed publications
- Characterization of soil properties, plant productivity, and interactions of soils, climate, and land-use and management over space and time.

## TECHNICAL STRENGTHS AND SKILLS

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*Experienced ecologist across agricultural, silvicultural, and natural systems.*

### **Statistical and GIS analysis**

- Expert in R for descriptive and predictive multivariate modeling, data acquisition, and visualization.
- Combining remotely sensed and field data for comparison of species interactions across space and time.
- Manipulation of raster and shape files for classification and interpolation based mapping.
- Aggregation and analysis of large datasets, structural equation models, process based models.

### **Technical Skills in Environmental Science**

- Selecting, sampling, and classifying sites based on soil and plant properties, climate, and geography.
- Experimental design for experimental and observational studies, linking environmental, climate, soil-plant relationships.
- Plant community and trait analysis, assesment of multispecies interactions, carbon and nitrogen analysis, productivity, carbon stocks, analysis of food web dynamics using stable isotopes.

### **Writing, research, and communication**

- Strong record of publication in top scientific journals as the primary author.
- Broad interdisciplinary background that allows synthesis of important topics from many fields of study.
- Confident and experienced in communication at all levels, from grade school to academic.

## SELECTED PEER REVIEWED PUBLICATIONS

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Liles, G.C., **Maxwell T.M.** et al., (In press) Two decades of experimental manipulation reveal potential for enhanced biomass accumulation in ponderosa pine plantations across climate gradients *J. Geophys. Res Biogeosciences*.

**Maxwell, T.M.**, et al., (2018). Integrating effects of species composition and soil properties to predict shifts in montane forest carbon–water relations. *Proc. Natl. Acad. Sci.*

**Maxwell T.M.**, et al., (2018) Predictable oxygen isotope exchange between plant lipids and environmental water: implications for ecosystem water balance reconstruction. *J. Geophys. Res Biogeosciences*.

**Maxwell, T.M.**, et al., (2014). Using multielemental isotopic analysis to decipher drought impacts and adaptive management in ancient agricultural systems. *Proc. Natl. Acad. Sci.* 2–3.

Culman, S.W., Haden, V.R., **Maxwell, T.M.**, Waterhouse, H., and William Horwath. (2014). Greenhouse Gas Mitigation Opportunities in California Agriculture: Review of California Cropland Emissions and Mitigation Potential. NI GGMOCA R 3. Durham, NC: Duke University.

## SELECTED PRESENTATIONS

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**Maxwell, T.M.** Understanding the carbon cycle across scales: Feedbacks, disturbance, and the role of soils in driving forest response to climate change. University of Oregon Department of Geography Seminar Series, 7, March, 2019 (Invited).

**Maxwell, T.M.** Understanding the global carbon cycle: Feedbacks, disturbance, and the role of soils in driving forest responses to climate change. University of Oregon, Introductory Environmental Science Course, 11, February, 2019 (Invited).

**Maxwell, T.M.** Using stable isotopes to investigate forest carbon-water relations. UC Davis Stable Isotope Seminar, 5, Nov. 2018 (Invited).

**Maxwell, T.M.**, et al., Dynamic and inertial controls on forest carbon-water relations. Abstract PP31D-2311, Oral presentation at 2017 Fall Meeting, American Geophysical Union, New Orleans, LA, Dec. 11-15.

**Maxwell, T.M.**, et al., Soil Properties Drive Carbon-Water Relations Across a Climate Gradient in Sierra Nevada Forests. Abstract 60315, Oral Presentation at 2016 Annual Meeting, Ecological Society of America, Ft. Lauderdale, FL, Aug. 7-12.

## RELEVANT COURSEWORK AND TRAINING

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**UC Davis summer field course - Field studies of soils in California ecosystems** *Field classification of soil taxonomy, topographic features, land use classification, vegetation composition from desert to alpine, and agricultural to natural ecosystems.*

**University of Utah Isocamp - Stable isotope ecology and biogeochemistry** *Application of stable isotopes to study interactions of plant community dynamics and nutrient cycling.*

**Relevant undergraduate and graduate coursework** *Experimental Design and Analysis; Applied Multivariate Statistical Modeling; Quantitative Geography; Plant-Soil Interrelations; Soil Genesis and Classification; Environmental Soil Chemistry; Soil Microbiology; Soil Physics; Geomorphology and River Management; Environmental Geology.*

## SERVICE

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### Peer Review

Spring 2017 - Present

- Served as a referee for peer review of the following scientific journals: Nature Scientific Reports, Global Change Biology, Ecology, Journal of Geophysical Research: Biogeosciences, Plant and Soil, PLOS-ONE, Agricultural and Forest Meteorology.

### Center for Land Based Learning

Spring 2013 - Spring 2017

- Assisted high school programs from rural communities to participate in ecological restoration projects at reclaimed wilderness sites in coordination with agricultural land owners.

### Pacific Crest Trail Association

Winter 2016 - Spring 2018

- Wrote scientific blog post about human-environment interactions along the trail.
- Clerical assistance for database organization and volunteer coordination.

## AWARDS

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National Geographic Exploration and Research, 2018 - \$5000, award: EC-422R-18