

TOBY MAXWELL

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CAREER OBJECTIVES

To apply my expertise as a biogeochemist to address fundamental and applied research questions that inform land use and management, and to promote environmental health in support of the well-being of the land, and the needs of our society.

EDUCATION

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

University of Oregon

April 2018 - Present

Title: Post Doctoral Scholar

Supervisor: Prof. Lucas Silva

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

April 2018 - Present

Title: Lab Manager

Supervisor: Prof. Lucas Silva

- 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

October 2012 - March 2018

Title: Graduate Student

Supervisor: Prof. Will Horwath

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.

- Designed and implemented sampling scheme for water from tributaries to the Ashokan reservoir across the entire watershed.
- Measured water chemistry in field and lab – pH, conductivity, Turbidity, DOC.
- Evaluated the potential for chlorination to generate cancerous disinfection byproducts.

TECHNICAL STRENGTHS AND SKILLS

Experienced ecologist across agricultural, silvicultural, and natural systems.

Technical Skills in Environmental Science

- Sampling, and classifying sites based on soil properties and plant community, climate, geology, and geography.
- Experimental design for experimental and observational studies.
- Expert in application of stable isotopes, both at natural abundance, and through probing experiments to study nutrient cycling and soil-plant interactions
- Plant community and trait analysis, assessment of multispecies interactions, carbon and nitrogen analysis, productivity, carbon stocks, analysis of food web dynamics

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.

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.

PEER REVIEWED PUBLICATIONS

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*.

Jeszurki, D., Couvreur, V., **Maxwell T.M.**, et al., (2017). Impact of root growth and hydraulic conductance on canopy carbon-water relations of young walnut trees (*Juglans regia* L.) under drought. *Scientia horticulturae*.

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.*

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 GGMOCAR 3. Durham, NC: Duke University.

SELECTED PRESENTATIONS

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

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

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

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