Jonathan J. Maynard

Research Scientist
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Research Experience

The primary focus of my research is to understand how soil properties and processes change in response to anthropogenic impacts, in particular land-use and climate change. My research employs a basic and applied approach to pedology that centers on anthropogenic impacts and quantifies and predicts patterns and processes of human-affected soil change. In particular, my research focuses on dynamic soil properties (i.e., soil organic matter, metals and nutrients) and the pedogenic controls that direct their spatial distribution, temporal dynamics and biogeochemical cycling. I have broad research experience working across a range of ecosystems (agriculture, rangelands, forests, wetlands), focusing on applied research questions addressing land-use/land-management issues that span a wide range of spatial scales (i.e., micron to national scales). In my current work at the USDA-ARS and previous work at U.S. EPA, I have gained extensive experience collaborating with scientists from a wide range of disciplines and working on projects that have a diversity of stakeholders. Additional research interests include soil biogeochemistry, restoration ecology, spatial/temporal statistics, soil informatics, remote sensing, GIS, and water quality.

Professional Employment & Affiliations

1903	Nobel Prize in Physics	*Awarded for her work on radioactivity with Pierre Curie and Henri Becquerel*
1911	Nobel Prize in Chemistry	*Awarded for the discovery of radium and polonium*

Education

Ph.D., Soils and Biogeochemistry *2010*

University of California, Davis *Davis, CA*

- **Biogeochemical cycling and retention of carbon and nutrients in a constructed wetland receiving agricultural runoff in the San Joaquin Valley, California**
- PI: Toby O'Geen and Randy Dahlgren

M.S., Soil Science *2008*

University of California, Davis *Davis, CA*

- **Biogeochemical cycling of phosphorus in constructed flow-through wetlands receiving agricultural runoff in the San Joaquin Valley, California.**
- PI: Toby O'Geen and Randy Dahlgren

B.S., International Agricultural Development *2000*

University of California, Davis *Davis, CA*

- **NA**

Publications

1. Herrick, JE, J Neff, A Quandt, S Salley, J Maynard, A Ganguli, and B Bestelmeyer (2019). Prioritizing land for investments based on short- and long-term land potential and degradation risk: A strategic approach. *Environmental Science and Policy* **96**(February), 52–58.
2. Maynard, JJ, TW Nauman, SW Salley, BT Bestelmeyer, MC Duniway, CJ Talbot, and JR Brown (2019). Digital mapping of ecological land units using a nationally scalable modeling framework. *Soil Science Society of America Journal* **83**(3), 666–686.

3. Maynard, JJ and MG Johnson (2018). Applying fingerprint Fourier transformed infrared spectroscopy and chemometrics to assess soil ecosystem disturbance and recovery. *Journal of Soil and Water Conservation* **73**(4), 443–451.
4. Sharifi, A, L Kalin, MM Hantush, RA Dahlgren, AT O'Geen, and JJ Maynard (2017). Capturing spatial variability of biogeochemical mass exchanges and reaction rates in wetland water and soil through model compartmentalization. *Journal of Hydrologic Engineering* **22**(1).
5. Browning, DM, JJ Maynard, JW Karl, and DC Peters (2017). Breaks in MODIS time series portend vegetation change: Verification using long-term data in an arid grassland ecosystem: Verification. *Ecological Applications* **27**(5), 1677–1693.
6. Maynard, JJ and JW Karl (2017). A hyper-temporal remote sensing protocol for high-resolution mapping of ecological sites. *PLoS ONE* **12**(4).
7. Maynard, JJ and MR Levi (2017). Hyper-temporal remote sensing for digital soil mapping: Characterizing soil-vegetation response to climatic variability. *Geoderma* **285**, 94–109.
8. Maynard, JJ, JW Karl, and DM Browning (2016). Effect of spatial image support in detecting long-term vegetation change from satellite time-series. *Landscape Ecology* **31**(9), 2045–2062.
9. Maynard, JJ and MG Johnson (2016). Uncoupling the complexity of forest soil variation: Influence of terrain indices, spectral indices, and spatial variability. *Forest Ecology and Management* **369**, 89–101.
10. Brauer, N, JJ Maynard, RA Dahlgren, and AT O'Geen (2015). Fate of nitrate in seepage from a restored wetland receiving agricultural tailwater. *Ecological Engineering* **81**, 207–217.
11. Maynard, JJ and MG Johnson (2014). Scale-dependency of LiDAR derived terrain attributes in quantitative soil-landscape modeling: Effects of grid resolution vs. neighborhood extent. *Geoderma* **230-231**, 29–40.
12. Maynard, JJ, RA Dahlgren, and AT O'Geen (2014). Autochthonous and allochthonous carbon cycling in a eutrophic flow-through wetland. *Wetlands* **34**(2), 285–296.
13. Maynard, JJ, RA Dahlgren, and AT O'Geen (2012). Quantifying spatial variability and biogeochemical controls of ecosystem metabolism in a eutrophic flow-through wetland. *Ecological Engineering* **47**, 221–236.
14. Maynard, JJ, RA Dahlgren, and AT O'Geen (2011). Soil carbon cycling and sequestration in a seasonally saturated wetland receiving agricultural runoff. *Biogeosciences* **8**(11), 3391–3406.
15. Maynard, JJ, AT O'Geen, and RA Dahlgren (2011). Sulfide induced mobilization of wetland phosphorus depends strongly on redox and iron geochemistry. *Soil Science Society of America Journal* **75**(5), 1986–1999.
16. O'Geen, AT, R Budd, J Gan, JJ Maynard, SJ Parikh, and RA Dahlgren (2010). *Mitigating nonpoint source pollution in agriculture with constructed and restored wetlands*. Vol. 108. C, pp. 1–76.
17. Maynard, JJ, AT O'Geen, and RA Dahlgren (2009a). Bioavailability and fate of phosphorus in constructed wetlands receiving agricultural runoff in the San Joaquin Valley, California. *Journal of Environmental Quality* **38**(1), 360–372.
18. Maynard, JJ, AT O'Geen, and RA Dahlgren (2009b). Spatial relationships of phosphorus sorption in a seasonally saturated constructed wetland soil. *Soil Science Society of America Journal* **73**(5), 1741–1753.
19. O'Geen, AT, JJ Maynard, and RA Dahlgren (2007). Efficacy of constructed wetlands to mitigate non-point source pollution from irrigation tailwaters in the San Joaquin Valley, California, USA. In: *Water Science and Technology*. Vol. 55. 3, pp.55–61.