

Curriculum vitae

Scott Powell

Associate Professor of Environmental Spatial Analysis
Department of Land Resources and Environmental Sciences
Montana State University
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EDUCATION

Ph.D., November 2004

Department of Ecology
Montana State University, Bozeman, MT

Advisor: Dr. Andrew Hansen

Title: Conifer cover increase in the Greater Yellowstone Ecosystem: Rates, extent, and consequences for carbon.

Master of Environmental Management, May 1997

Nicholas School of the Environment
Duke University, Durham, NC

Advisor: Dr. Dean Urban

Title: An analysis of the pattern and distribution of landscape change in the North Carolina Piedmont

Bachelor of Arts, May 1993

Macalester College, St. Paul, MN

Advisor: Dr. Mark Davis

Majors: Biology and Environmental Studies

ACADEMIC APPOINTMENTS

Associate Professor of Environmental Spatial Analysis, Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, MT
August 2020 - present

Assistant Professor of Environmental Spatial Analysis, Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, MT
August 2014 - 2020

Director, Spatial Sciences Center, Montana State University, Bozeman, MT
February 2020 – present

Assistant Director, Geospatial Core Facility, Montana State University, Bozeman, MT
January 2022 - present

Program Coordinator and Faculty Lead, Professional M.S. in Land Resources and Environmental Sciences, Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, MT
August 2012 - present

Assistant Research Professor of Geographic Information Science, Department of Land Resources and Environmental Sciences and Spatial Sciences Center, Montana State University, Bozeman, MT
January 2009 – July 2014

Postdoctoral Research Ecologist, U.S.D.A. Forest Service, Pacific Northwest Research Station, Corvallis, OR
January 2005 – January 2009

Affiliate Faculty, Department of Forest Science, Oregon State University, Corvallis, OR

June 2006 – January 2009

EXTRAMURAL RESEARCH FUNDING

AmericaView, 2023-2024, \$25,500

StateView program development and operations for the state of Montana

Role: PI

Montana Fertilizer Advisory Committee, 2022-2023, \$54,465

Combatting soil acidification to avoid large economic losses to Montana Farmers

Role: Co-PI (PI: Manbir Rakkar, MSU)

U.S. Department of Agriculture, 2021-2023, \$138,106

Understanding soil spatial and micro-climate effects on grain protein formation in field pea

Role: Co-PI (PI: Perry Miller, MSU)

Montana Noxious Weed Trust Fund, 2021-2023, \$40,000

Multi-scale analysis of ventenata control treatments on the Crow Reservation

Role: Co-PI (with Jane Mangold and Zach Fighter, MSU)

Woods Hole Research Center, 2020-2021, \$23,311

Very high resolution remote sensing mapping of surface water, vegetation, and carbon emissions for the WHRC

Yukon-Kuskokwim Delta Research Watershed

Role: PI (Co-Is: Jennifer Watts and Sue Natali, WHRC)

U.S. Department of Agriculture, 2019-2022, \$75,830

Increasing nitrogen fixation potential in pulses for environmental and economic sustainability

Role: Co-I (PI: Clain Jones, MSU)

Montana Fertilizer Advisory Committee, 2019-2020, \$54,100

Understanding acidification and management of Montana Soils.

Role: Co-I (PI: Rick Engel)

Montana Wheat and Barley Committee, 2019, \$30,339

Mapping nutrient deficiency, water stress, and toxicity with frequent drone observations to improve fertilizer efficiency and management

Role: PI (Co-Is: Bruce Maxwell, Rick Engel, Paul Stoy, Clain Jones, MSU)

Montana Wheat and Barley Committee, 2017, \$19,866

Frequent, high resolution observations of crop development to improve predictions of wheat yield and protein content

Role: PI (Co-Is: Paul Stoy, MSU and Bruce Maxwell, MSU)

Western Sustainable Agriculture and Research Education, 2017-2020, \$264,015

Soil acidity management of long-term no-till fields in Montana to prevent crop failure

Role: Co-I (PI: Rick Engel, MSU)

Bureau of Land Management, 2016-2021, \$109,677

Multi-scale analysis of the effects of prescribed fire on terrestrial ecosystem dynamics in the Missouri and Musselshell River Breaks, central Montana

Role: Co-I (PI: Jack Brookshire, MSU)

National Institute of Health, 2016-2019, \$83,285

Supplement to Promote Diversity, UNM Center for Native Environmental Health Equity

Role: Co-I and graduate student advisor (PI: Mari Eggers, MSU)

Montana Wheat and Barley Committee, 2016, \$16,000

Remote technologies for precision agriculture in wheat agroecosystems: using eddy covariance and an unmanned aerial vehicle to understand the spatial variability of grain yields and protein
Role: Co-I (PI: Paul Stoy, MSU)

Center for Environmentally Sustainable Transportation in Cold Climates, 2016-2017, \$52,569

Determination of soil organic carbon and soil chloride concentrations: An initial effort to determine if chloride-based road deicers impact carbon sequestration rates in roadside right-of-way
Role: Co-I (PI: Laura Fay, Western Transportation Institute)

Center for Environmentally Sustainable Transportation in Cold Climates, 2015-2018, \$62,214

Evaluating management options to increase roadside carbon sequestration.
Role: Co-PI (PI: Rob Ament, Western Transportation Institute)

NASA Land Cover/Land Use Change Program, 2014-2019, \$749,783

Downscaling IPCC land use scenarios for global change adaptation planning in mountainous environments
Role: Co-I (PI: Andrew Hansen, MSU)

USGS, subcontract from the University of Idaho, 2014-2017, \$476,295; MSU portion - \$38,532

Projecting climate change effects on aspen distribution and productivity in the Northern Rockies by coupling hydrological and landscape-disturbance models.
Role: Co-PI (PI: Douglas Shinneman, USGS)

NASA Carbon Monitoring System Program, subcontract from Boston University, 2012-2014, \$413,507; MSU portion - \$26,237

Integrating and expanding a regional carbon monitoring system in the NASA CMS.
Role: Co-PI (PI: Robert Kennedy, BU)

United States Department of Agriculture, NIFA, subcontract from Boston University, 2012-2014, \$770,843; MSU portion - \$43,646

Integrated, observation-based carbon monitoring for wooded ecosystems in Washington, Oregon, and California.
Role: Co-PI (PI: Robert Kennedy, BU)

U.S. Department of Transportation, Federal Highway Administration, 2011-2012, \$100,000

Assessing the carbon sequestration potential of roadsides and roadside re-vegetation.
Role: Co-PI (PI: Rob Ament, WTI)

National Park Service, 2010-2012, \$99,000

Developing methods for monitoring change in conifer cover across biophysical gradients in national parks.
Role: Co-PI with Andrew Hansen

NASA Carbon Cycle Science, subcontract from the U.S. Department of Agriculture, 2008-2010, MSU portion - \$127,469

Role of North American Forest Disturbance and Regrowth in the North American Carbon Program: Integrated Analyses of Landsat and U.S. Forest Service Forest Inventory and Analysis Data – Phase 2.
Role: Co-PI (PI: Sam Goward, UMD)

INTERNAL RESEARCH FUNDING

Montana Space Grant Consortium Faculty Fellowship, 2019, \$4,456

Fine-scale mapping of arctic and boreal ecosystems with drones for improved carbon flux estimates
Role: PI

College of Agriculture/Montana Agricultural Experiment Station Equipment Grant, 2017, \$12,000

thermoMAP: a thermal infrared sensor for a UAV
Role: PI

College of Agriculture/Montana Agricultural Experiment Station Equipment Grant, 2014, \$50,000

MSU UAV (Unmanned Aerial Vehicle) for Teaching and Research

Role: PI (Co-Is: Diana Cooksey and Rick Lawrence, MSU)

Montana Space Grant Consortium, 2012-2014, \$46,690

Disturbance interactions in the Greater Yellowstone Ecosystem: Time-series analyses of aerial photography and Landsat satellite imagery.

Role: PI

Montana State University, Interdisciplinary Proposal Development Fund, 2011, \$7,500

Medium-term forecasts of forest composition, structure, and function in the Greater Yellowstone Ecosystem: Response to and recovery from multiple disturbances.

Role: Co-PI (PI: Paul Stoy, MSU)

Montana State University, Extended University, 2011, \$48,600

Expanding access to MSU through new online programs.

Role: Co-PI (PI: Robert Peterson, MSU)

OTHER RESEARCH ACTIVITY

National Institute of Food and Agriculture, 2020 –

Research and extension for unmanned aerial systems (UAS) applications in U.S. agriculture and natural resources

Role: Co-I

Montana Agricultural Experiment Station, 2019-2024

Geospatial monitoring of vegetation and land use dynamics

Role: PI

Montana Agricultural Experiment Station, 2016-2019

Development of multi-scale geospatial monitoring systems for vegetation and land use dynamics

Role: PI

Montana Agricultural Experiment Station, 2016

*Physiology of yield and quality as affected by high protein gene (*Gpc-B1*) in wheat*

Role: Cooperator (PI: Jessica Torrion, MSU)

Department of Energy, 2012-2013

Big Sky Carbon Sequestration Partnership Phase III - Hyperspectral sensor for large-area monitoring of carbon dioxide reservoirs and pipelines.

Role: Project Scientist (PI: Kevin Repasky, MSU)

Department of Energy, 2009-2011

Big Sky Carbon Sequestration Partnership Phase II - Monitoring agricultural practices affecting soil carbon storage using satellite remote sensing.

Role: Project Scientist (PI: Rick Lawrence, MSU)

The Nature Conservancy, Turner Enterprises, 2016-2017

Characterizing Vegetation Composition and structure of riparian areas using unmanned aerial systems

Role: graduate student advisor, collaborator (PI: Nathan Korb, TNC)

TEACHING EXPERIENCE

Department of Land Resources and Environmental Sciences

Montana State University, Bozeman, MT

Land Resources and Environmental Sciences Capstone (ENSC 499R), odd falls

Landscape and Ecosystem Ecology (LRES 571), every spring

Remote Sensing Applications in Environmental Science (LRES 573), every fall

Graduate Seminar (LRES 594), spring 2012

Remote Sensing and Digital Image Processing (GPHY 426), fall 2013

Land Resources and Environmental Sciences (ENSC 110), fall 2015, fall 2016, fall 2018

Frontiers in Remote Sensing (LRES 572), spring 2016, spring 2018, spring 2021

Professional Paper (LRES 575), every semester
Remote Sensing (GPHY 426/429; LRES 525), spring 2023

University Honors Program

Montana State University, Bozeman, MT

Texts and Critics (UH 201), fall 2011

Honors Seminar: Where science and policy diverge: A global tour of climate change science and political deadlock (HONR 494), fall 2013, fall 2014, fall 2015

Great Expeditions: Frontlines of climate change: Active ice, glacial politics (travel to Iceland and Germany), (HONR 204), spring 2017

Honors Academy: Taking the pulse of Montana in a changing world (HONR 291CS), summers 2018-2020

Affiliate Professor

Oregon State University, Corvallis, OR

Synthesis in Remote Sensing of Vegetation (FS 599), Department of Forest Science, fall 2006

Invited Lecturer

Montana State University, Bozeman, MT

Ecosystem Biogeochemistry (ENSC 468/LRES 568), Department of Land Resources and Environmental Sciences, spring 2019

Spatial Sciences Technology and Application (LRES 262), Department of Land Resources and Environmental Sciences, spring 2011-2018

Land Resources and Environmental Sciences (ENSC 110), Department of Land Resources and Environmental Sciences, fall 2010-2020

Yellowstone: A Scientific Laboratory (ERTH 212), Department of Earth Science, fall 2010

Landscape Ecology and Management (BIOL 515), Department of Ecology, fall 2003, fall 2011

Principles of Ecology (BIOL 303), Department of Ecology, spring 2004

Remote Sensing and Image Processing (LRES 325), Department of Land Resources and Environmental Sciences, fall 2003

Oregon State University, Corvallis, OR

Advanced Aerial Photography and Remote Sensing (FOR420/520), College of Forestry, fall 2006

PUBLICATIONS

43. Cich, K.L., and **S. Powell**. In prep. Recovery of microtopography following prairie restoration: Implications for biodiversity monitoring.

42. Fordyce, S.I., P.M. Carr, C. Jones, J. Eberly, A. Sigler, S. Ewing, and **S. Powell**. Submitted. Sentinel-2-based predictions of soil depth to inform water and nutrient retention strategies in dryland wheat. *Agricultural Water Management*.

41. Wood, D., P. Stoy, **S. Powell**, and E. Beever. 2022. Antecedent climatic conditions spanning several years influence multiple land-surface phenology events in semi-arid environments. *Frontiers in Ecology and Evolution*, 10.1007010. doi:10.3389/fevo.2022.1007010

40. Hansen, A.J., K. Mullan, D.M. Theobald, N. Robinson, A. East, and **S. Powell**. 2022. Informing conservation decisions to target private lands of highest ecological value and risk of loss. *Ecological Applications*, <https://doi.org/10.1002/eap.2612>

39. Stoy, P.C., A. Khan, A. Wipf, N. Silverman, and **S. Powell**. 2022. The spatial variability of NDVI within a wheat field: Information content and implications for yield and grain protein monitoring. *PLoS ONE* 17(3): e0265243. <https://doi.org/10.1371/journal.pone.0265243>

38. Wood, D., T.M. Preston, **S. Powell**, and P.C. Stoy. 2022. Multiple UAV flights across the growing season can characterize fine scale phenological heterogeneity within and among vegetation functional groups. *Remote Sensing*, 14, 1290, <https://doi.org/10.3390/rs14051290>

37. Norderud, E.D., **S. Powell**, and R.K.D. Peterson. 2021. Risk assessment for the establishment of *Vespa mandarinia* (Hymenoptera: Vespidae) in the Pacific Northwest, United States. *Journal of Insect Science*, 21 (4), <https://doi.org/10.1093/jisesa/ieab052>
36. Webb, H., N. Barnes, **S. Powell**, and C. Jones. 2021. Does drone remote sensing accurately estimate soil pH in a spring wheat field in southwest Montana? *Precision Agriculture*. <https://doi.org/10.1007/s11119-021-09812-z>
35. Hansen, A.J., K. Mullan, D.M Theobald, **S. Powell**, N. Robinson, and A. East. 2021. Natural vegetation cover on private lands: Locations and risk of loss in the northwestern United States. *Ecosphere*, <https://doi.org/10.1002/ecs2.3756>
34. Wood, D., **S. Powell**, P.C. Story, L. Thurman, and E. Beever. 2021. Is the grass always greener? Land surface phenology reveals differences in peak and season-long vegetation productivity responses to climate and management. *Ecology and Evolution*, <https://doi.org/10.1002/ece3.7904>
33. Reisig, D., K. Mullan, A. Hansen, **S. Powell**, D. Theobald, and R. Ulrich. 2021. Natural amenities and low-density residential development: Magnitude and spatial scale of influences. *Land Use Policy*, 102, doi:10.1016/j.landusepol.2021.105285
32. Pinto, J., **S. Powell**, R. Peterson, D. Rosalen, and O. Fernandes. 2020. Detection of defoliation injury in peanut with hyperspectral proximal remote sensing. *Remote Sensing*, 12, 3828; doi: 10.3390/rs12223828
31. Bode, E., R. Lawrence, **S. Powell**, S. Savage, and A. Trowbridge. 2018. Time-series approach for mapping mountain pine beetle infestation extent and severity in the U.S. Central Rocky Mountains. *Journal of Applied Remote Sensing* 12(4), 046030 (2018), doi: 10.1117/1.JRS.12.046030.
30. Safari, A., H. Sohrabi, and **S. Powell**. 2018. Comparison of satellite-based estimates of aboveground biomass in coppice oak forests using parametric, semi-parametric and non-parametric modelling methods. *Journal of Applied Remote Sensing* 12(4), 046026, doi: 10.1117/1.JRS.12.046026.
29. Kennedy, R.E., J. Ohmann, M. Gregory, H. Roberts, Z. Yang, D.M. Bell, V. Kane, M.J. Hughes, W. Cohen, **S. Powell**, N. Neeti, T. Larrue, S. Hooper, J. Kane, D. Miller, J. Perkins, J. Braaten, and R. Seidl. 2018. An empirical, integrated forest biomass monitoring system. *Environmental Research Letters* 13 025004 <https://doi.org/10.1088/1748-9326/aa9d9e>
28. Morin, M., R. Lawrence, K. Repasky, T. Sterling, C. McCann, and **S. Powell**. 2017. Agreement analysis and spatial sensitivity of multispectral and hyperspectral sensors in detecting vegetation stress at management scales. *Journal of Applied Remote Sensing* 11(4) doi: 10.1117/1.JRS.11.046025.
27. McCann, C., K.S. Repasky, R. Lawrence, and **S. Powell**. 2017. Multi-temporal mesoscale hyperspectral data of mixed agricultural and grassland regions for anomaly detection. *ISPRS Journal of Photogrammetry and Remote Sensing* 131: 121-133.
26. Safari, A., H. Sohrabi, **S. Powell**, S. Shataee, S.J. Alavi. 2017. A comparative assessment of multi-temporal Landsat 8 and machine learning algorithms for estimating aboveground carbon stock in coppice oak forests. *International Journal of Remote Sensing* 38(22) 6407-6432 doi: 10.1080/01431161.2017.1356488
25. McCann, C., K.S. Repasky, M. Morin, R. Lawrence, and **S. Powell**. 2017. Novel histogram based unsupervised classification technique to determine natural classes from biophysically relevant fit parameters to hyperspectral data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 10(9) 4138-4148 doi: 10.1109/JSTARS.2017.2701360
24. McCann, C., K.S. Repasky, M. Morin, R. Lawrence, and **S. Powell**. 2017. Using Landsat surface reflectance data as a reference target for multiswath hyperspectral data collected over mixed agricultural rangeland areas. *IEEE Transactions on Geoscience and Remote Sensing* 55(9) doi: 10.1109/TGRS.2017.2699618

24. Kleindl, W.J., **S.L. Powell**, and F.R. Hauer. 2015. Effect of thematic map classification on landscape multi-metric assessment. *Environmental Monitoring and Assessment* 187:321 doi: 10.1007/s10661-015-4546-y.
23. Vsevolozhskaya, O.A., M.C. Greenwood, **S.L. Powell**, and D.V. Zaykin. 2015. Resampling-based multiple comparison procedure with application to point-wise testing with functional data. *Environmental and Ecological Statistics* 22: 45-59 doi: 10.1007/s10651-014-0282-7.
22. Bellante, J.G., **S.L. Powell**, R.L. Lawrence, K. Repasky, and T. Dougher. 2014. Hyperspectral detection of a subsurface CO₂ leak in the presence of water stressed vegetation. *PLoS ONE* 9(10): e108299.doi:10.1371/journal.pone.0108299.
21. Kennedy, R.E., S. Andréfouët, W.B. Cohen, C. Gómez, P. Griffiths, M. Hais, S.P. Healey, E.H. Helmer, P. Hostert, M.B. Lyons, G.W. Meigs, D. Pflugmacher, S.R. Phinn, **S.L. Powell**, P. Scarth, S. Sen, T.A. Schroeder, A. Schneider, R. Sonnenschein, J.E. Vogelmann, M.A. Wulder, and Z. Zhu. 2014. Bringing an ecological view of change to Landsat-based remote sensing. *Frontiers in Ecology and the Environment* doi:10.1890/130066.
20. **Powell, S.L.**, W.B. Cohen, R.E. Kennedy, S.P. Healey, and C. Huang. 2014. Observation of trends in biomass loss due to disturbance in the conterminous U.S.: 1986-2004. *Ecosystems* 17: 142-157.
19. Vsevolozhskaya, O., M. Greenwood, G. Bellante, **S. Powell**, R. Lawrence, and K. Repasky. 2013. Combining functions and the closure principle for performing follow-up tests in functional analysis of variance. *Computational Statistics and Data Analysis* 67: 175-184.
18. **Powell, S.L.**, A.J. Hansen, T.J. Rodhouse, L.K. Garrett, J.L. Betancourt, G.H. Dicus, and M.K. Lonnerker. 2013. Woodland dynamics at the northern range periphery: A challenge for protected area management in a changing world. *PLoS ONE* 8(7): e70454. doi:10.1371/journal.pone.0070454.
17. Bellante, J.G., **S.L. Powell**, R.L. Lawrence, K. Repasky, and T. Dougher. 2013. Aerial detection of a simulated CO₂ leak from a geologic sequestration site using hyperspectral imagery. *International Journal of Greenhouse Gas Control* 13: 124-137.
16. Savage, S.L., R.L. Lawrence, S.G. Custer, J.T. Jewett, **S.L. Powell**, and J.A. Shaw. 2012. Analyzing change in Yellowstone's terrestrial emittance with Landsat imagery. *GIScience and Remote Sensing* 49(3): 317-345.
15. Jewett, J., R. Lawrence, L. Marshall, P. Gessler, **S. Powell**, and S. Savage. 2011. Spatiotemporal relationships between climate change and whitebark pine mortality in the Greater Yellowstone Ecosystem. *Forest Science* 57(4): 320-335.
14. Watts, J.D., **S.L. Powell**, R.L. Lawrence, and T. Hilker. 2011. Improved classification of conservation tillage adoption using high temporal and synthetic satellite imagery. *Remote Sensing of Environment* 115: 66-75.
13. Healey, S.P., E. Lapoint, G. Moisen, and **S. L. Powell**. 2011. Maintaining the confidentiality of plot locations by exploiting the low sensitivity of forest structure models to different spectral extraction kernels. *International Journal of Remote Sensing* 32(1): 287-297.
12. Thomas, N.E., C. Huang, S.N. Goward, **S.L. Powell**, K. Rishmawi, K. Schleeweis, and A. Hinds. 2011. Validation of North American forest disturbance dynamics derived from Landsat time series stacks. *Remote Sensing of Environment* 115: 19-32.
11. **Powell, S.L.**, W.B. Cohen, S.P. Healey, R.E. Kennedy, G.G. Moisen, K.B. Pierce, and J.L. Ohmann. 2010. Quantification of Live Aboveground Forest Biomass Dynamics with Landsat Time-Series and Field Inventory Data: A Comparison of Empirical Modeling Approaches. *Remote Sensing of Environment* 114: 1053-1068.

10. **Powell, S.L.**, R.L. Lawrence, C. Sommers Austin, S. Wood. 2010. A flexible approach to help overcome limitations of moderate resolution satellite imagery for mapping invasive saltcedar on the Bighorn River, Montana. *Journal of Terrestrial Observation* 2(2): 9-22
9. Savage, S.L., R.L. Lawrence, S.G. Custer, J.T. Jewett, **S.L. Powell**, and J. A. Shaw. 2010. Review of alternative methods for estimating terrestrial emittance and geothermal heat flux for Yellowstone National Park using Landsat imagery. *GIScience and Remote Sensing* 47(4): 460-479.
8. **Powell, S.L.**, W.B. Cohen, Z. Yang, J.D. Pierce, and M. Alberti. 2008. Quantification of impervious surface in the Snohomish Water Resources Inventory Area of Western Washington from 1972-2006. *Remote Sensing of Environment* 112: 1895-1908.
7. Goward, S.N., J.G. Masek, W. Cohen, G. Moisen, G.J. Collatz, S. Healey, R.A. Houghton, C. Huang, R. Kennedy, B. Law, **S. Powell**, D. Turner, and M.A. Wulder. 2008. Forest disturbance and North American Carbon Flux. *EOS, Transactions, American Geophysical Union* 89(11): 105-116.
6. **Powell, S.L.**, and A.J. Hansen. 2007. Conifer cover increase in the Greater Yellowstone Ecosystem: Frequency, rates, and spatial variation. *Ecosystems* 10(2): 204-216.
5. **Powell, S.L.**, D. Pflugmacher, A.A Kirschbaum, Y. Kim, and W.B. Cohen. 2007. Moderate resolution remote sensing alternatives: a review of Landsat-like sensors and their applications. *Journal of Applied Remote Sensing*, doi: 10.1117/1.2819342.
4. Zambon, M., R.L. Lawrence, A. Bunn, and **S. Powell**. 2006. Effect of alternative splitting rules on image processing using classification tree analysis. *Photogrammetric Engineering and Remote Sensing* 72(1): 25-30.
3. Hansen, A.J., R.L. Knight, J. M. Marzluff, **S. Powell**, K. Brown, P. H. Hernandez, and K. Jones. 2005. Effects of exurban development on biodiversity: Patterns, mechanisms, and research needs. *Ecological Applications* 16(6): 1893-1905.
2. Lawrence, R.L., A. Bunn, **S. Powell**, and M. Zambon. 2004. Classification of remotely sensed imagery using stochastic gradient boosting as a refinement of classification tree analysis. *Remote Sensing of Environment* 90: 331-336.
1. Wessels, K.J., R.S. Defries, J. Dempewolf, L.O. Anderson, A.J. Hansen, **S. L. Powell**, and E.F. Moran. 2004. Mapping regional land cover with MODIS data for biological conservation: Examples from the Greater Yellowstone Ecosystem, USA and Para State, Brazil. *Remote Sensing of Environment* 92: 67-83.

BOOK CHAPTERS, REPORTS, DATA SETS, CONFERENCE PROCEEDINGS, AND THESES

14. Barnes, N., H. Webb, M.K. Farina, **S. Powell**, and J.D. Watts. 2021. Multispectral Imagery, NDVI, and Terrain Models, Big Trail Lake, Fairbanks, AK, 2019. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1834>
13. Norderud, E.D., **S. Powell**, and R.K.D. Peterson. 2021. Risk assessment for the establishment of the Asian giant hornet (*Vespa mandarinia*) in the Pacific Northwest. bioRxiv doi: 10.1101/2021.02.01.429186
12. [Jones, C., R. Engel, S. Ewing, P. Miller, K. Olson-Rutz, and S. Powell. 2019. Soil acidification: An emerging problem in Montana. Montana Fertilizer eFacts. Montana State University Extension. No. 78. January 2019.](#)
11. Fay, L., R. Ament, T. Hartshorn, and **S. Powell**. 2019. Evaluating the potential effects of deicing salts on roadside carbon sequestration. A report prepared for the Center for Environmentally Sustainable Transportation in Cold Climates, University of Alaska, Fairbanks, AK.
10. Ament, R., T. Hartshorn, and **S. Powell**. 2018. Evaluating management options to increase roadside carbon sequestration. A report prepared for the Center for Environmentally Sustainable Transportation in Cold Climates, University of Alaska, Fairbanks, AK.

9. Shinneman, D.J., T.E. Link, K. Kavanagh, E. Strand, S. McIlroy, **S. Powell**, R. Scheller, J. Campbell, D. Marks, M. Seyfried, and A. Winstral. 2017. Projecting climate change effects on aspen distribution and productivity in the northern Great Basin and central Rockies using a multi-model approach. A report prepared for the USGS Northwest Climate Science Center.
8. Ament, R., **Powell, S.**, Stoy, P., and Begley, J. 2014. Roadside vegetation and soils on federal lands – Evaluation of the potential for increasing carbon capture and storage and decreasing carbon emissions. A report prepared for the Western Federal Lands Highways, Federal Highway Administration, Vancouver, WA.
7. **Powell, S.** 2011. Spatial and temporal dynamics of recent forest disturbance in the Greater Yellowstone Ecosystem. In *Questioning Greater Yellowstone's Future: Climate, Land Use, and Invasive Species. Proceedings of the 10th Biennial Scientific Conference on the Greater Yellowstone Ecosystem*. October 11-13, 2010, Mammoth Hot Springs Hotel, Yellowstone National Park. C. Andersen, ed., Yellowstone National Park, WY, and Laramie, WY: Yellowstone Center for Resources and University of Wyoming William D. Ruckelshaus Institute of Environment and Natural Resources.
6. **Powell, S.L.**, A.J. Hansen, and W.B. Cohen. 2008. Mapping the extent and distribution of conifer cover increase in the Greater Yellowstone Ecosystem. In Dupont, A., and Jacobs, H. (Eds.), *Landscape Ecology Research Trends* (pp. 27-43). Nova Science Publishers, Hauppauge, New York.
5. **Powell, S.L.**, W. Cohen, and R. Kennedy. 2007. Analysis of biomass change derived from spectral trajectories. *American Society for Photogrammetry and Remote Sensing – New Remote Sensing Technologies for Resource Managers: Proceedings of the Eleventh Forest Service Remote Sensing Applications Conference, Salt Lake City, UT, April 24-28, 2006*.
4. Masek, J.G., Wolfe, R., Hall, F., Goward, S.N., Huang, C., Cohen, W.B., Kennedy, R.E., **Powell, S.L.**, Healey, S.P., and Moisen, G. 2007. Assessing North American forest disturbance from the Landsat archive, *IGARSS Proceedings, 2007, Barcelona, Spain*.
3. Healey S., G. Moisen, J.G. Masek, W.B. Cohen, S.N. Goward, **S.L. Powell**, M. Nelson, D. Jacobs, A. Lister, R. Kennedy, and J. Shaw. 2006. Measurement of forest disturbance and re-growth with Landsat and FIA data: anticipated benefits from FIA's collaboration with NASA and University partners. *Proceedings of the Seventh Annual Forest Inventory and Analysis Science Symposium, Portland, Maine, October 2005*.
2. **Powell, S.L.** 2004. Conifer cover increase in the Greater Yellowstone Ecosystem: Rates, extent, and consequences for carbon. Dissertation. Montana State University, Bozeman, MT, USA.
1. **Powell, S.L.** 1997. An analysis of the pattern and distribution of landscape change in the North Carolina Piedmont. Thesis. Nicholas School of the Environment, Duke University, Durham, NC, USA.

ORAL PRESENTATIONS AND POSTERS (* denotes student presenter)

- Farina, M.*, M. Beck, J. Watts, W. Christian, T. McDermott, N. Hassan, **S. Powell**, and R. Hatzepichler. 2022. Exploring fine-scale drivers of methane sources and sinks in a boreal wetland. *American Geophysical Union Fall Meeting 2022*.
- Farina, M.*, M. Beck, J. Watts, and **S. Powell**. 2022. Exploring fine-scale drivers of carbon sources and sinks in a boreal wetland. *Joint Aquatic Sciences Meeting*. Grand Rapids, MI. May, 2022
- Wood, D.J.A.*, P.C. Stoy, **S. Powell**, and E. Beaver. 2022. Legacy climate over prior seasons and years influences rangeland phenology and productivity. *Society of Range Management 2022 Annual Meeting*. February, 2022.
- Farina, M.*, J. Watts, **S. Powell**, M. Beck, M., & S. Natali (2021, December 13 - 17). Exploring environmental conditions driving high spatial variability in CO₂ and CH₄ fluxes in a boreal wetland. [Session B22D The Resilience and Vulnerability of Arctic and Boreal Ecosystems to Climate Change]. *American Geophysical Union Fall Meeting 2021*. <https://agu.confex.com/agu/fm21/meetingapp.cgi/Paper/951632>

Powell, S., D. Wood, and Z. Fighter. 2021. Tools for monitoring rangelands: remote sensing. *Rangeland carbon tracking and management workshop*. Montana State University. September 2021.

Wood, D.J.A.*, P.C. Stoy, **S. Powell**, and E. Beever. 2021. Ecological memory modulates land surface phenology and productivity measures. 2021 ESA Annual Meeting. August 2-6, 2021. Virtual poster.

Wood, D.J.A.*, and **S. Powell**. Does identifying vegetation group phenological heterogeneity matter? Tradeoffs between multiple vs. single UAV flight land cover classifications. *Big Sky GeoCon 2021*, April 7, 2021.

Pinto, J.*, M. Hager*, L. Ermatinger*, D. Weaver, **S. Powell**, and R. Peterson. An integrated approach to quantify plant stress for assessing yield loss potential in wheat stem sawfly infested wheat fields. *Department of Land Resources and Environmental Sciences seminar*, February 22, 2021.

Farina, M.*, J. Watts, **S. Powell**, K. Savage, S. Natali, J. Kimball, Z. Liu, J. Du, Y. Yi, C. Miller. The resilience and vulnerability of the regional carbon sink in Alaska and Canada. *American Geophysical Union (AGU) Fall Meeting 2020*.

Wood, D.J.A.*, **S. Powell**, and P. Stoy. Ecological memory in the Upper Missouri Basin Watershed. *Society of Range Management 73rd Annual Meeting*. Denver, CO, February 11-16th, 2020.

Farina, M.*, J. Watts, **S. Powell**, J. Kimball, J. Du, Z. Liu, Y. Yi, S. Natali. Spatial and temporal trends in Arctic-boreal carbon fluxes. *NASA Arctic Boreal Vulnerability Experiment (ABOVE) Science Team Meeting*, June 6, 2020.

Powell, S.L. (Invited) Drones for remote sensing in Agriculture. *Crop and Pest Management School, Department of Plant Sciences and Plant Pathology, Montana State University*. Bozeman, MT, January 8, 2020.

Farina, M.*, J. Watts, **S. Powell**, et al. High-resolution, drone-based methane flux upscaling analysis. *Woods Hole Research Center*, Falmouth, MA, January 2020.

Farina, M.*, J. Watts, **S. Powell**, et al. Assessment of spatiotemporal variability in Arctic-boreal carbon flux budgets and comparisons between bottom-up CH₄ flux estimates and observed atmospheric concentrations. *AGU Fall Meeting*, San Francisco, CA, December 2019.

Ulrich, R.*, **S. Powell**, M. Greenwood, and K. Banner. A Bayesian modeling approach for improved land use classification. *AGU Fall Meeting*, San Francisco, CA, December 2019.

Jones, C., R. Engel, P. Carr, P. Miller, S. Ewing, S. Fordyce, J. Holzer, S. Brown, and **S. Powell**. Soil acidification: An emerging threat to no-till. *American Society of Agronomy Annual Conference*, San Antonio, Texas. November 11, 2019.

Farina, M.*, J. Watts, **S. Powell** et al. Understanding Drivers of Spatial Variability in Alaska's Wetland Methane Budget. *NASA Terrestrial Ecology Science Team Meeting*, College Park, MD, September 2019.

Engel, R., C. Jones, **S. Powell**, and P. Carr. Soil Acidification of cultivated fields in semiarid Montana: remediation and challenges. *Canadian Soil Science Annual Meeting*. Saskatoon, Saskatchewan, Canada. July 11, 2019.

Farina, M.*, J. Watts, **S. Powell**. Upscaling methane fluxes in boreal peatlands using an unmanned aerial vehicle (UAV). *LRES Research Colloquium*, Montana State University, Bozeman, MT, April 2019.

Ulrich, R.*, **S. Powell**, M. Greenwood, and K. Banner. A Bayesian modeling approach for improved land use classification. *Montana State University Student Research Celebration*, Bozeman, MT, April 2019.

Engel, R., C. Jones, P. Carr, **S. Powell**, and S. Fordyce. Challenges and Opportunities to Soil Acidity Remediation in the Semi-arid Northern Great Plains. *Soil Science Society America International Meeting*. San Diego, CA. January 9, 2019.

Powell, S.L. (Invited) Drones in agriculture: Increasing farm and ranch efficiency. *Montana State University Extension workshops*. Park County, MT, May 28, 2019.

Powell, S.L. (Invited) Drones in agriculture: Increasing farm and ranch efficiency. *Montana State University Extension workshops*. Broadwater County, MT, May 29, 2019.

Powell, S.L. Geospatial monitoring of vegetation and land use dynamics. *Montana Agricultural Experiment Proposal*. Bozeman, MT, December 19th, 2018.

Powell, S.L. (Invited) The teaching continuum of “online” vs. “in-the-field.” *Montana State University Faculty Symposium: Inspiring Excellence in Teaching and Learning*. Bozeman, MT, November 8th, 2018.

Three Irons, E.*, **S. Powell**, M. Eggers, J. Hoover, J. Doyle, R. Payn and M. Powell. 2018. Investigation of coliform contamination in private well water on the Crow Reservation. *Metal Toxicity and Carcinogenesis, Annual Conference*. Albuquerque, NM, October 30th, 2018.

Three Irons, E.*, **S. Powell**, M. Eggers, J. Hoover, J. Doyle, R. Payn and M. Powell. 2018. Investigation of coliform contamination in private well water on the Crow Reservation. *AISES, National Conference*. Oklahoma City, OK, October 5th, 2018.

Three Irons, E.*, **S. Powell**, M. Eggers, J. Hoover, J. Doyle, R. Payn and M. Powell. 2018. Investigation of coliform contamination in private well water on the Crow Reservation. *MPHA/MEHA Annual Conference and Meeting*. Helena, MT, September 19th, 2018.

Powell, S.L., R. Ulrich, A. Hansen, K. Mullan, and D. Theobald. Trends and patterns of low-density residential development in the mountain northwest. *Biennial Scientific Conference on the Greater Yellowstone Ecosystem*, Big Sky, MT, September 13th, 2018

Ulrich, R.*, and **S. Powell**. Spatial-temporal analysis of low density development in the Northwestern U.S. *Society for Industrial and Applied Mathematics Conference*. Philadelphia, PA, September 12th, 2018

Powell, S.L. (Invited) Advances in “do-it-yourself” remote sensing. *Woods Hole Research Center*. Falmouth, MA, May 31st, 2018

Three Irons, E.*, **S. Powell**, M. Eggers, J. Hoover, J. Doyle, R. Payn and M. Powell. 2018. Investigation of coliform contamination in private well water on the Crow Reservation. *Pacific Northwest Water Research Annual Symposium*. Corvallis, OR, April 24th, 2018.

Three Irons, E.*, **S. Powell**, M. Eggers, J. Hoover, J. Doyle, R. Payn and M. Powell. 2018. Investigation of coliform contamination in private well water on the Crow Reservation. *Collaborative Research Center for American Indian Health, Annual Summit*. Sioux Falls, SD, April 17th, 2018.

Ulrich, R.*, and **S. Powell**. Spatial-temporal analysis of low density development in the Northwestern U.S. *American Association of Geographers*. New Orleans, LA, April 12th, 2018.

Three Irons, E.*, **S. Powell**, M. Eggers, J. Hoover, J. Doyle, R. Payn and M. Powell. 2017. Investigation of coliform contamination in private well water on the Crow Reservation. *Native Environmental Health Equity Research Center, Annual Meeting*. Rapid City, SD, November 4th, 2017.

Powell, S.L. 2017. (Invited) Advances in “do-it-yourself” remote sensing. *Montana Institute on Ecosystems Rough Cut Science Series*. Bozeman, MT, October 18th, 2017.

Oldham, M.J.* and **Powell, S.L.** 2017. Evaluating unmanned aerial systems as a tool for fine-scale mapping of juniper encroachment into riparian ecosystems. *Ecological Society of America Annual Meeting*. Portland, OR, August 10th, 2017.

Powell, S.L., P.C. Stoy, and B.D. Maxwell. 2017. Mapping the spatial and temporal variability in crop development to improve predictions of wheat yield and protein content. *Ecological Society of America Annual Meeting*. Portland, OR, August 8th, 2017.

Powell, S.L. and T.M. Sterling. 2017. Challenges and solutions for distance-based professional paper instruction for an online masters program in environmental science. *Distance Teaching and Learning Conference*. Madison, WI. July 26th, 2017.

Three Irons, E.*, **S. Powell**, M. Eggers, and J. Doyle. 2017. Investigation of coliform contamination in private well water on the Crow Reservation. *Universities Council on Water Resources, Annual Conference*. Fort Collins, CO, June 13th, 2017

Lankau, E.W.*, K.L.D. Richgels, and **S. Powell**. 2017. Application of remote sensing to monitoring black-tailed prairie dog (*Cynomys ludovicianus*) colonies in South Dakota. *Department of Land Resources and Environmental Sciences Research Colloquium*. Bozeman, MT, April 25th, 2017.

Stoy, P.C., M.M. Morgan, B. Maxwell, **S. Powell**, K. McVay, J. Torrión, and A. Wipf. 2017. Surface-atmosphere carbon dioxide exchange in Montana agroecosystems. *Joint NACP and AmeriFlux Principal Investigators Meeting*. North Bethesda, MD, March 27th-30th, 2017.

Powell, S.L. 2016. Lessons learned in developing an online master's program in environmental science. *International Conference on Learning, Teaching, and Student Success*. Bozeman, MT, November 4th, 2016.

Powell, S.L. 2016. UAS for precision agriculture. MSU Bozeman Farms Day, Precision Agriculture Station, MSU College of Agriculture and Montana Agricultural Experiment Station. July 7th, 2016.

Cohen, W.B., Z. Yang, S.V. Stehman, D. Bell, C. Allen, T. Schroeder, S. Healey, **S. Powell**, D. Mildrexler, G. Meigs, J. Masek, C. Huang, and T. Hilker. 2015. Declining forest health in the western United States: Exploring the climate connection. *5th North American Carbon Program Principal Investigators Meeting*, Washington, D.C., January 26th-29th, 2015.

Powell, S.L., W.B. Cohen, R.E. Kennedy, and S.P. Healey. 2014. (Invited) Estimates of U.S. forest biomass loss as a result of disturbance from a Landsat time-series approach. *ForestSAT*, Riva del Garda, Italy.

Powell, S.L. 2013. Algorithm assessment and intercomparison working group summary. *NASA CMS Science Team Meeting*, Pasadena, California.

Powell, S.L., W.B. Cohen, R.E. Kennedy, and S.P. Healey. 2013. Empirical observation of trends in biomass loss due to disturbance in the conterminous U.S.: 1986-2004. *North American Carbon Program All-Investigators Meeting*, Albuquerque, New Mexico.

Bellante, G.*, **S. Powell**, R. Lawrence, K. Repasky, and T. Dougher. 2013. Hyperspectral Remote Sensing as a Monitoring Tool for Geologic Carbon Sequestration, *American Society for Photogrammetry and Remote Sensing 2013 Proceedings*, March 24-28, 2013, Baltimore, Maryland.

Bellante, G.*, **S. Powell**, R. Lawrence, K. Repasky, and T. Dougher. 2012. Hyperspectral Remote Sensing as a Monitoring Tool for Geologic Carbon Sequestration, *AmericaView Fall Technical Meeting*, September 24-26, 2012, Sioux Falls, South Dakota.

Powell, S.L., R.E. Kennedy, J.L. Ohmann, W.B. Cohen, M. Gregory, H. Roberts, V. Kane, and J. Lutz. 2012. Comparison of biomass allometric approaches for regional scale carbon mapping, *ForestSAT*, Corvallis, OR

- Powell, S.L.,** W.B. Cohen, R.E. Kennedy, S.P. Healey, and C. Huang. 2012. Assessment of forest disturbance and biomass flux across the conterminous U.S. Invited presentation to the Forest Dynamics and Disturbance session, *Association of American Geographers Annual Meeting*, New York, NY.
- Powell, S.L.** 2011. (Invited) Forest disturbance, biomass, and the carbon cycle. USGS Northern Rocky Mountain Science Center, Bozeman, MT.
- Powell, S.L.** 2010. Spatial and temporal dynamics of recent forest disturbance in the Greater Yellowstone Ecosystem. *The 10th Biennial Scientific Conference on the Greater Yellowstone Ecosystem*, Yellowstone National Park, WY.
- Powell, S.L.,** W.B. Cohen, and R.E. Kennedy. 2010. Aboveground forest biomass trends for the conterminous U.S. inferred from Landsat time-series and field inventory data. Invited presentation to *Synergy of EO Products to Map the Essential Climate Variable Biomass, IEEE International Geoscience and Remote Sensing Symposium*, Honolulu, HI.
- Bellante, G.*, **S.L. Powell**, R.L. Lawrence, K.S. Repasky, and T. Dougher. 2010. Hyperspectral imaging for large-area monitoring of carbon dioxide sequestration sites. *IEEE International Geoscience and Remote Sensing Symposium*, Honolulu, HI.
- Powell, S.L.** 2010. (Invited) Forest disturbance dynamics and the carbon cycle – linking remote sensing, field data, and modeling. Department of Ecology, Montana State University, Bozeman, MT, 4/29/10.
- Powell, S.L.,** W.B. Cohen, and R.E. Kennedy. 2010. Assessment of trends in live, aboveground biomass for the conterminous U.S. *2010 NASA Terrestrial Ecology Science Team Meeting*, La Jolla, CA.
- Powell, S.L.** 2010. (Invited) Reconciling differences in forest carbon models: Improving our quantification of forest disturbance dynamics. Department of Land Resources and Environmental Sciences, Montana State University, Bozeman, MT, 1/25/10.
- Powell, S.L.,** W.B. Cohen, and R.E. Kennedy. 2009. Aboveground Forest Biomass Dynamics: Assessment with Landsat Time-Series and Field Inventory Data. *The Fifth International Workshop on the Analysis of Multi-temporal Remote Sensing Images*, Groton, CT.
- Powell, S.L.,** B. Butler, R. Riemann, S. Healey, W. Cohen, and R. Kennedy. 2008. Quantifying land cover trends for the state of Rhode Island: Satellite time-series analysis for FIA reporting needs. *2008 FIA Science Symposium*, Park City, UT.
- Powell, S.L.,** Kennedy, R.E., Healey, S.P., Pierce, K.B., Cohen, W.B., Moisen, G.G., Ohmann, J.L. 2008. Comparison of methods to model aboveground biomass for derivation of 20+ year trajectories. *NASA Carbon Cycle and Ecosystems, Joint Science Workshop*, College Park, MD.
- Powell, S.L.,** W.B. Cohen, and Z. Yang. 2007. Mapping urban land cover dynamics in Western Washington. Invited presentation to the *Oregon State University Spatial Data Management Group*, Corvallis, OR.
- Powell, S.L.,** W.B. Cohen, and Z. Yang. 2006. Mapping urban land cover dynamics in Western Washington. Invited presentation to the *Oregon State University College of Forestry, Advanced Aerial Photography and Remote Sensing class*, Corvallis, OR.
- Powell, S.L.** 2006. (Invited) Reducing uncertainty in ecosystem dynamics with field ecology and remote sensing. Department of Biology, Linfield College, McMinnville, OR.
- Powell, S.L.,** K.B. Pierce, S.P. Healey, W.B. Cohen, G.G. Moisen, and J.L. Ohman. 2006. Comparison of methods for mapping changes in forest structure. *Eighth Annual Forest Inventory and Analysis Science Symposium*, Monterey, CA.
- Powell, S.L.,** W.B. Cohen, S.P. Healey, R.E. Kennedy, G.G. Moisen, S.N. Goward, J.G. Masek, C. Huang. 2006. Integration of Forest Inventory Data with Landsat Time Series Data for Characterization of Forest Disturbance and Regrowth: Joint Objectives of the North American Carbon Program (NACP) and Forest Inventory and Analysis (FIA). *Joint Workshop on NASA Biodiversity, Terrestrial Ecology, and Related Applied Sciences*, College Park, MD.

Powell, S.L., W.B. Cohen, R.E. Kennedy. 2006. Analysis of biomass change derived from spectral trajectories. *Eleventh Biennial USDA Forest Service Remote Sensing Applications Conference*, Salt Lake City, UT.

Powell, S.L., W.B. Cohen, and T. Schroeder. 2005. Characterizing successional variability: Linking FIA and Landsat. *Seventh Annual Forest Inventory and Analysis Symposium*, Portland, ME.

Powell, S.L. 2004. Conifer cover increase in the Greater Yellowstone Ecosystem: Rates, extent, and consequences for carbon. Ph.D. defense seminar. Montana State University, Bozeman, MT.

Powell, S.L. 2003. Using remote sensing to quantify changes in forest structure and composition in the Greater Yellowstone Ecosystem. *Remote Sensing at Montana State University Conference*, Bozeman, MT.

Powell, S.L., and A.J. Hansen. 2003. Spectral modeling of forest dynamics in Greater Yellowstone. *Annual meeting of the International Association of Landscape Ecology*, Banff, Alberta, Canada.

Powell, S.L., and A.J. Hansen. 2002. Abiotic drivers of conifer forest expansion in the Greater Yellowstone Ecosystem. *Annual meeting of the Ecological Society of America*, Tucson, AZ.

Powell, S.L., A.J. Hansen, and R.L. Lawrence. 2001. Conifer forest expansion and densification in the Greater Yellowstone Ecosystem: Detection and quantification over a 15-year time period. *Annual meeting of the International Association of Landscape Ecology*, Tempe, AZ.

Powell, S.L., D.L Urban, and P.N. Halpin. 1997. An analysis of the pattern and distribution of landscape change in the North Carolina Piedmont. *Annual meeting of the International Association of Landscape Ecology*, Durham, NC.

AWARDS

- Teaching Award of Merit, North American Colleges and Teachers of Agriculture, 2019
- MSU Spirit of Discovery Award, 2017
- Nominated for the MSU Academic Advising Award, 2016
- Nominated for the MSU Spirit of Discovery Award, 2016
- MSU Excellence in Online Teaching Award, 2015
- PNW Research Station's Science Findings Award with W. Cohen, R. Kennedy, and S. Healey, 2006
- NASA-MSU Professional Enhancement Award, 2001
- William R. Angell Foundation Prize for Excellence in Biological Sciences, 1993

SYNERGISTIC ACTIVITIES

Departmental:

- Graduate advisor:
 - Primary academic advisor for >100 professional MS students, LRES
 - Zach Fighter, MS, LRES (Co-advised with Jane Mangold), 2020-2023
 - Brett Griesbaum, PhD, EES (Co-advised with Paul Nugent), 2022-
 - Amanda Shine, PhD, EES (Co-advised with Jessica Torrión), 2020
 - David Wood, PhD, EES, 2019-2021
 - Mary Farina, PhD, EES, (Co-advised with Jennifer Watts), 2019-
 - Rachel Ulrich, MS, Mathematical Sciences (Co-advised with Mark Greenwood), 2018-2020
 - Emery Three Irons, MS, LRES, 2016-2019
 - Michael Oldham, MS, LRES, 2015-2018
 - Aiden Johnson, MS, LRES, 2014
 - Gabriel Bellante, MS, LRES (Co-advised with Rick Lawrence), 2009-2011
- Graduate committees served on:
 - Nate Hieli, MS, Ecology, 2022-
 - Lochlin Ermatinger, MS, LRES, 2022-
 - Makayla Mather, MS, Earth Sciences, 2022-
 - Kendal Edmo, MS, Earth Sciences, 2022-

- Kristen Prinzing, PhD, American Studies, 2020-
- Kate Lozono, MS, LRES, 2020-2022
- Michael Stone, MS, Earth Sciences, 2020-
- Robert Haynam, PhD, EES, 2019-
- Gabe Bromley, PhD, LRES, 2018-2021
- Emma Bode, MS, LRES, 2017-2018
- Mikindra Morin, MS, LRES, 2015-
- Cooper McCann, PhD, Physics, 2014-2017
- Arjun Pandey, PhD, LRES, 2013
- Olga Vsevolozhskaya, PhD, Mathematics, 2013
- William Kleindl, PhD, Systems Ecology, University of Montana, 2011-2014
- Shannon Savage, PhD, LRES, 2009
- Graduate professional papers advised:
 - Allison Law, LRES, 2023
 - Jessica Pavelka, LRES, 2023
 - Lissette Rodriguez, LRES, 2023
 - James Quillin, LRES, 2023
 - Theresa Ten Eyck, LRES, 2023
 - Jadey Ryan, LRES, 2023
 - Shaelyn Bauer, LRES, 2022
 - Helena Wilson, LRES, 2022
 - Karli Cich, LRES, 2022
 - Chris Bilbrey, LRES, 2021
 - Katie Little, LRES, 2021
 - Drew Howing, LRES, 2021
 - Welles Bretherton, LRES, 2020
 - Erin Monty, LRES, 2020
 - Kyla Gupta, LRES 2020
 - Kelsey Smith, LRES, 2019
 - Sean Carroll, LRES, 2019
 - Landon Peppel, LRES, 2019
 - Hannah Thatcher, LRES, 2019
 - Eric Martin, LRES, 2018
 - Tona van der Hiele, LRES, 2018
 - Cameron Sapp, LRES, 2018
 - Amy Watrud, LRES, 2018
 - Rebecca Hosley, LRES, 2018
 - Dan Rottinghaus, LRES, 2018
 - Josh Hall, LRES, 2017
 - Emily Price, LRES, 2017
 - Megan Couser, LRES, 2017
 - Emily Lankau, LRES, 2017
 - Marianne Wascom, LRES, 2016
 - Ricardo Segovia, LRES, 2016
 - Elizabeth Montgomery, LRES, 2016
 - Elizabeth Morgan, LRES, 2016
 - Rebecca Hollender, LRES, 2016
 - Shannon Crossen, LRES, 2016
 - Chris Cote, LRES, 2015
 - Jeri Irby, LRES, 2015
 - Erin Frolli, LRES, 2014
 - Served on graduate committee for 66 professional papers
- Undergraduate and graduate work-study students supervised in lab:
 - Francine Mullen, 2021 (MSU undergraduate student)
 - Ricardo Lima, 2019-2020 (visiting PhD student from Brazil)
 - Hailey Webb, 2019 (MSU Undergraduate Scholars Program)
 - Nathaniel Barnes, 2019 (MSU Undergraduate Scholars Program)

- Tanner Tompkins, 2018
- Alex Milton, 2017
- Aaron Wipf, 2016-2017
- Rachel Ulrich, 2016-2017
- Taylor Fragomeni, 2015
- Paul Bodalski, 2015-2017
- Logan Jackson, MSU, 2014-2015
- Michael Endicott, Rutgers University, 2014
- Chair, LRES search committee for remote sensing faculty position, 2022
- Member, LRES search committee for precision agriculture faculty position, 2023
- Member, LRES search committee for general ecology position, 2021
- Member, LRES search committee for GPS faculty position, 2018
- Member, LRES, Peer Evaluation/Mentoring Committee, 2018-
- Member, LRES search committee for Microbiology online teaching position, 2017
- Member, LRES Outcomes Assessment Committee, 2015-
- Member, LRES Mentoring Committee, 2014-2018
- Member, LRES Online MS Admission Committee, 2012-
- Member, LRES Graduate Curriculum Committee, 2010-

College:

- Member, Review Committee, College of Agriculture/MAES Teaching/Research Equipment RFP, 2015
- Member, College of Agriculture search committee for grant coordinator position, 2021
- Member, College of Agriculture search committee for precision agriculture cluster hire, 2021

University:

- Member, University Graduate Council, 2023-
- Member, Honors College Advisory Council, 2020-
- Reviewer, National Conference on Undergraduate Research abstract submissions, January, 2020
- Panelist, “Online Teaching Panel”, Center for Faculty Excellence, February 27, 2019
- Member, Online Program Stakeholders, 2018-
- Member, Online Advisory Council, 2016-2017
- Faculty Mentor, Center for Faculty Excellence, 2016
- Faculty Fellow, Center for Faculty Excellence, 2016
- Panelist, “Transitioning to online teaching: Learn what it takes from successful online instructors”, 2016
- Member, Review Committee, Office of the Provost, Excellence in Online Teaching Award, 2015 - 2017
- Member, Review Committee, GIS Scholarship, MSU-MAGIP, 2015, 2016
- Moderator/Judge, Montana Space Grant Consortium Student Research Symposium, 2011, 2013
- Member, Department Head Search Committee, Department of Ecology, 2003
- Co-coordinator, MSU Workshop: “Remote Sensing at MSU”, 2003
- Volunteer, Remote Sensing Coordinator, Montana High School Science Olympiad, 2002-2003
- Member, GIS Analyst Search Committee, Landscape Biodiversity Lab, 2002

Professional:

- PI, MontanaView, part of the national AmericaView remote sensing consortium, 2020-
- Member, Review Panel, Ford Foundation Fellowship Program, 2016 - 2020
- Member, Scientific Committee, IEEE/GRSS Int’l Geoscience and Remote Sensing Symposium, 2014-2023
- Member, Review Panel, NASA Terra MLT Panel Review, 2016
- Member, National Ecological Assessment Team, 2015-2017
- Member, NASA Carbon Monitoring System Science Team, 2012-2014
 - Algorithm Assessment/Inter-comparisons Working Group Coordinator
- NASA Earth Science Senior Review for the Mission Ext. of Earth Sci. Operating Missions, 2013, 2015
- Gravelly Landscape Collaborative, 2010-2013
- Associate Editor of remote sensing for *Journal of Forestry*, 2011-2014
- GOF-C-GOLD Biomass Working Group participant, 2009-2011
- Proposal reviewer:
 - National Science Foundation, Geography and Spatial Sciences Program, 2014
 - Natural Sciences and Engineering Research Council of Canada, 2009
 - Montana Space Grant Consortium and MT NASA EPSCoR, Research Initiation Program, 2013
 - NASA Terrestrial Ecology Program

- Manuscript reviewer for *Nature Climate Change*, *Remote Sensing of Environment*, *Landscape Ecology*, *Biogeosciences*, *Canadian Journal of Remote Sensing*, *Environmental Management*, *Journal of Environmental Management*, *Photogrammetric Engineering and Remote Sensing*, *Journal of Forestry*, *Urban Ecosystems*, *Journal of Applied Remote Sensing*, *Applied Geography*, *Carbon Management*, *Journal of Photogrammetry and Remote Sensing*, *Forests*, *Geographical Bulletin*, *Climatic Change*, *Forest Science*, *Remote Sensing*, *Science of the Total Environment*

Outreach/Public Service:

- Panelist, MSU Extension Workshops, “Drones in agriculture: Increasing farm and ranch efficiency.” Park and Broadwater Counties, Montana. May 28th and 29th, 2019.
- Panelist, Teaching Innovation, MSU Faculty Symposium, November 8th, 2018
- Panelist, The Wheeler Center and the Department of Political Science, “Science, policy, and politics”, March 6th, 2017
- Panelist, MSU Bozeman Farms Day, “UAS for precision agriculture.” MSU College of Agriculture and Montana Agricultural Experiment Station, 2016
- Panelist, Honors College panel, “The World is Watching: Pope Francis and climate change”, 2015

Professional Development:

- Distance Teaching and Learning Conference, Madison, WI, 2014 & 2017
- Indigenous Mentoring Program – Pacific Northwest Collaborative Opportunities for Success in Mentoring of Students, 2016
- Indigenous Knowledge Field Camp, Moscow, ID, 2016
- Google Earth Engine Workshop, Mountain View, CA, 2016
- Online Learning Consortium Innovate Conference, New Orleans, LA, 2016
- American Society for Photogrammetry and Remote Sensing, UAS Mapping Conference, Reno, NV, 2015
- Academic Advising in a Virtual World, Houston, TX 2012

PROFESSIONAL SOCIETIES

- Member, Ecological Society of America
- Member, International Association of Landscape Ecology
- Member, American Geophysical Union
- PI, MontanaView, part of the AmericaView consortium
- Member, North American Colleges and Teachers of Agriculture
- Montana Association of Geographic Information Professionals