Matthew Richard Voss Ross

Assistant Professor ESS; Faculty Director, Geospatial Centroid

Education

2006-2010 **BA Ecology, French Minor**, *University of Colorado*, Boulder, CO.

2011-2017 **PhD Ecology**, *Duke University*, Durham, NC.

2017-2018 **Post-Doc Remote Sensing**, *University of North Carolina*, Chapel Hill, NC.

Teaching

WR 418 (3 credits, 2018-2022)- Land-use and Water Quality Course covers basic aqueous geochemistry, with an emphasis on analyzing data using R and open access datasets.
WR 419 (3 credits, 2018-2020) - Water Quality Analyses Course covered analytical tools for analyzing water quality data with an emphasis on maintaining and curating a sensor network.
ESS 523a (3 credits, 2019-present) - Environmental Data Science Course covers environmental analysis in R, with an emphasis on geospatial analysis and visualization.
ESS 523c (2 credits, 2022-present) - Environmental Data Science Water Resources Course covers detailed water resource analyses pipelines using R.
WR 204 (3 credits, 2023-present) - Sustainable Watersheds Course covers introductory watershed and sustainability topics.
WR 440 (3 credits, 2022-present) - Watershed Problem Analysis Capstone course for Watershed students.
Stat 158 A&B (1 credit, 2020) Open access course for learning R Module 1, Module 2
Open access hydrology course modules Materials

Awards

Graduate Student Advisor of the Year Ecosystem Science and Sustainability Department, 2019
Award for Creative, Innovative and Impactful Instruction Warner College of Natural Resources, 2020
Outstanding Reviewer American Geophysical Union, Global Biogeochemical Cycles, 2020
Dean's Award for Excellence to an Early Career Faculty Member Warner College of Natural Resources, 2022

Major Service Contributions

- Faculty Director Geospatial Centroid (2020-present) - Coordinate and lead five full-time staff to deliver high quality geospatial analyses, trainings, and workshops for clients both on and off campus.
- Chair, Diversity Equity and Inclusion Committee for ESS Department (2022-present)
- Faculty adviser for 15 Water Resource track Professional Science Masters Students (2021-present)
- Advised or Co-Advised 6 Research Masters Students, 3 PhD students
- Committee Member on 34 PhDs or Research MS

Grants and Contracts

- **Total Grants 2018 - 2023 - $5,684,162**
- **Portion to Lab 2018 - 2023 - $4,426,026**

Individual Grants

2023 **National Park Service**, *PI*, $1,689,000.
- Climate change vulnerability assessments for water supply to national parks

2023 **USGS Remote Sensing Branch**, *PI*, $ 199,900.
- AquaSat 2.0 democratizing and improving remote sensing of water quality for inland waters

2023 **City of Fort Collins**, *PI*, $ 250,000.
- Poudre River monitoring network and decision system (Long-term funding)

2023 **BHP Internet of Water**, *PI*, $ 350,000.
- Visualizing and interpreting municipal water quality data

2022 **NASA Water Resources**, *PI*, $ 294,000.
- Real-time satellite and sensor fusion for predicting and understanding water quality threats to water supply networks of Northern Colorado

2022 **Northern Colorado Water Supply Coalition**, *PI*, $ 86,000.
- Cameron Peak Fire water quality impacts to rivers and reservoirs, towards a decision support system

2022 **NASA Remote Sensing of Water Quality**, *PI*, $ 311,000.
- Understanding and predicting algae blooms in networks of rivers and reservoirs

2021 **USGS Integrated Information Dissmenination Division**, *PI*, $ 199,253.
- Process-guided deep learning for informing selection of monitoring locations in priority watersheds

2021 **Colorado Water Center**, *PI*, $ 35,000.
- High elevation fire controls on reservoir and river algae blooms

2021 **Northern Colorado Water Supplier Coalition**, *PI*, $ 85,000.
- Cameron Peak Fire water quality impacts to rivers and reservoirs

2020 **NSF Hydrological Sciences RAPID Award**, *CSU PI*, $ 20,552.
- Collaborative research: Increased access to infrastructure for distance education in hydrologic science

2020 **Colorado State University Provost Office**, *PI*, $ 19,996.
- University-wide training in foundational data-analysis software

2020 **Colorado Water Institute**, *PI*, $ 49,970.
- Linking the topology of forest disturbance to water quality to enhance forest and water resource management in Colorado

2020 **City of Fort Collins**, *PI*, $ 12,000.
- Poudre river monitoring network and decision system

2019 **NSF DEB Macrosystems and NEON-Enabled Science**, *CSU PI*, $ 420,864.
- Collaborative research: MACRO-Sheds: Comparative ecosystem biogeochemistry at continental scales

2019 **USDA National Need Fellowship program**, *CO-PI*, $ 243,500.
- Re-visioning graduate training for the era of agricultural big data

2019 **NSF EAR Hydrological Sciences Post-DOC awarded directly to Anna Bergstrom**, *Adviser*, $ 0.
- Controls on weathering, solute fluxes, and geologic carbon cycling in glacierized catchments

2019 **Wyoming Water Research Program**, *CO-PI*, $ 25,000.
- Identifying, predicting and managing the occurrence of harmful cyanobacterial blooms in Wyoming reservoirs

2018 **City of Fort Collins, In-Situ Sensor Manufacturing**, *PI*, $ 85,000.
- Real-time water quality monitoring and decision network in the Poudre River

2018 **Colorado Water Institute**, *PI*, $ 49,991.
- Tools for improving knowledge of reservoir water quality in the Front Range of Colorado

Contracts to the Geospatial Centroid

The Geospatial Centroid is a service and contracting center at Colorado State University. We specialize in geospatial analysis, undergraduate internship training, and broad cartography. In Winter of 2020, I transitioned into the role of Faculty Director of the Centroid. As a service center on campus, we operate primarily with funds from external and internal clients, below is a quick summary of our contract growth under my leadership.

- FY 21 - Total Contracts ~ $95,000
- FY 22 - Total Contracts ~ $185,000
- FY 23 - Total Contracts ~ $265,000
- FY 24 (as of Aug 2023) ~ $355,000

Publications

2023 **User-focused evaluation of National Ecological Observatory Network streamflow estimates**, *S Rhea, N Gubbins, AG DelVecchia, MRV Ross, ES Bernhardt*, Scientific Data.
- 4

2023 **MacroSheds: A synthesis of long-term biogeochemical, hydroclimatic, and geospatial data from small watershed ecosystem studies**, *MJ Vlah, S Rhea, ES Bernhardt, W Slaughter, N Gubbins, AG DelVecchia, ...*, Limnology and Oceanography Letters.
- 3

2023 **Human activities change suspended sediment concentration along rivers**, *J Gardner, T Pavelsky, S Topp, X Yang, MRV Ross, S Cohen*, Environmental Research Letters.
- 1

2023 **Leveraging gauge networks and strategic discharge measurements to aid development of continuous streamflow records**, *MJ Vlah, MRV Ross, S Rhea, ES Bernhardt*, EGUsphere.
- 0

2023 **National-scale, remotely sensed lake trophic state, 1984-2020**, *MF Meyer, S Topp, TV King, R Ladwig, RM Pilla, H Dugan, JR Eggleston, ...*, EarthArXiv.
- 0

2023 **At the interfaces of the hydrologic sciences: Connecting water, elements, ecosystems, and people through the major contributions of Dr. Emily Bernhardt**, *AM Helton, JL Morse, EB Sudduth, M Ardón, R Bier, KA Voss, MRV Ross, ...*, Journal of Hydrology.
- 0

2022 **Mapping flow-obstructing structures on global rivers**, *X Yang, TM Pavelsky, MRV Ross, SR Januchowski-Hartley, W Dolan, ...*, Water Resources Research.
- 13

2022 **Mines to forests? Analyzing long-term recovery trends for surface coal mines in Central Appalachia**, *CJ Thomas, RK Shriver, F Nippgen, M Hepler, MRV Ross*, Restoration Ecology, e.
- 4

2022 **Heterogenous controls on lake color and trends across the high-elevation US Rocky Mountain region**, *IA Oleksy, SM Collins, SJ Sillen, SN Topp, M Austin, EK Hall, CM O'Reilly, ...*, Environmental Research Letters.
- 2

2022 **A simple metric for predicting the timing of river phytoplankton blooms**, *NE Bruns, JB Heffernan, MRV Ross, M Doyle*, Ecosphere.
- 1

2021 **The color of rivers**, *JR Gardner, X Yang, SN Topp, MRV Ross, EH Altenau, TM Pavelsky*, Geophysical Research Letters.
- 42

2021 **Multi-decadal improvement in US lake water clarity**, *SN Topp, TM Pavelsky, EH Stanley, X Yang, CG Griffin, MRV Ross*, Environmental Research Letters.
- 26

2021 **Shifting patterns of summer lake color phenology in over 26,000 US lakes**, *SN Topp, TM Pavelsky, HA Dugan, X Yang, J Gardner, MRV Ross*, Water Resources Research.
- 16

2021 **Consistent declines in aquatic biodiversity across diverse domains of life in rivers impacted by surface coal mining**, *M Simonin, JD Rocca, JR Gerson, E Moore, AC Brooks, L Czaplicki, ...*, Ecological Applications.
- 14

2021 **Mountaintop mining legacies constrain ecological, hydrological and biogeochemical recovery trajectories**, *MRV Ross, F Nippgen, BL McGlynn, CJ Thomas, AC Brooks, RK Shriver, ...*, Environmental Research Letters.
- 5

2021 **Predicting mean annual and mean monthly streamflow in Colorado ungauged basins**, *A Eurich, SK Kampf, JC Hammond, M Ross, K Willi, AG Vorster, B Pulver*, River Research and Applications.
- 5

2021 **Identifying geomorphic process domains in the synthetic landscapes of West Virginia, USA**, *KL Jaeger, MRV Ross*, Journal of Geophysical Research: Earth Surface.
- 3

2020 **Research trends in the use of remote sensing for inland water quality science: Moving towards multidisciplinary applications**, *SN Topp, TM Pavelsky, D Jensen, M Simard, MRV Ross*, Water.
- 176

2020 **Timing of Landsat overpasses effectively captures flow conditions of large rivers**, *GH Allen, X Yang, J Gardner, J Holliman, CH David, M Ross*, Remote Sensing.
- 25

2020 **A participatory science approach to expanding instream infrastructure inventories**, *A Whittemore, MRV Ross, W Dolan, T Langhorst, X Yang, S Pawar, ...*, Earth's Future.
- 18

2020 **Mercury and selenium loading in mountaintop mining impacted alkaline streams and riparian food webs**, *JR Gerson, LC Naslund, YT Liu, H Hsu-Kim, CT Driscoll, MRV Ross, ...*, Biogeochemistry.
- 9

2019 **AquaSat: a dataset to enable remote sensing of water quality for inland waters**, *MRV Ross, SN Topp, AP Appling, X Yang, C Kuhn, D Butman, M Simard, ...*, Water Resources Research.
- 88

2019 **Excess nitrate export in mountaintop removal coal mining watersheds**, *AC Brooks, MRV Ross, F Nippgen, BL McGlynn, ES Bernhardt*, Journal of Geophysical Research: Biogeosciences.
- 13

2018 **Mapping the yearly extent of surface coal mining in Central Appalachia using Landsat and Google Earth Engine**, *AA Pericak, CJ Thomas, DA Kroodsma, MF Wasson, MRV Ross, ...*, PloS one.
- 115

2018 **Pyrite Oxidation Drives Exceptionally High Weathering Rates and Geologic CO2 Release in Mountaintop-Mined Landscapes**, *MRV Ross, F Nippgen, BA Hassett, BL McGlynn, ES Bernhardt*, Global Biogeochemical Cycles.
- 43

2018 **Direct and indirect drivers of land degradation and restoration**, . *Barger, N. N., Gardner, T. A., Sankaran, M., Belnap, J., Broadhurst, L ...*, In IPBES.
- 0

2017 **Creating a more perennial problem? Mountaintop removal coal mining enhances and sustains saline baseflows of Appalachian watersheds**, *F Nippgen, MRV Ross, ES Bernhardt, BL McGlynn*, Environmental science & technology.
- 46

2016 **Deep impact: Effects of mountaintop mining on surface topography, bedrock structure, and downstream waters**, *MRV Ross, BL McGlynn, ES Bernhardt*, Environmental science & technology.
- 107

2015 **Designer ecosystems: incorporating design approaches into applied ecology**, *MRV Ross, ES Bernhardt, MW Doyle, JB Heffernan*, Annual review of environment and resources.
- 56

2015 **Microchemical analysis of selenium in otoliths of two West Virginia fishes captured near mountaintop removal coal mining operations**, *MC Arnold, LA Friedrich, TT Lindberg, M Ross, NM Halden, E Bernhardt, ...*, Environmental toxicology and chemistry.
- 8

2012 **Effects of fuels reductions on plant communities and soils in a piñon-juniper woodland**, *MR Ross, SC Castle, NN Barger*, Journal of arid environments.
- 47

Press

2023 **Artists, scientists and smokey bear share science of post-fire recovery through art**, North Forty News.

2023 **Science as art: Show to highlight post-fire recovery**, Farm Progress.

2023 **Artists, scientists and smokey bear share science of post-fire recovery through art**, SOURCE.

2021 **U.S. west faces little-known effect of raging wildfires: contaminated water**, Reuters.

2021 **River colors are changing**, NASA Earth Observatory.

2020 **Aquasat gives water quality research new eyes in the sky**, Eos.

2019 **Mining powers modern life, but can leave scarred lands and polluted waters behind**, The Conversation.

2019 **These beautiful maps capture the rivers that pulse through our world**, Smithsonian Magazine.

2019 **Poudre river fish kill unsolved, but provided push for revolutionary water monitoring effort**, The Coloradan.

2019 **Studying water quality with satellites and public data**, SOURCE.

2018 **Weathering rates for mined lands exponentially higher than unmined sites**, SOURCE.

Data and code downloads

2022 **MacroSheds: a synthesis of long-term biogeochemical, hydroclimatic, and geospatial data from small watershed ecosystem studies**.
- 1200

2021 **River Surface Reflectance Database (RiverSR)**.
- 3552

2020 **LimnoSat-US: A Remote Sensing Dataset for U.S. Lakes from 1984-2020**.
- 1647

2019 **AquaSat: A Data Set to Enable Remote Sensing of Water Quality for Inland Waters**.
- 1201

2018 **Smaller, miscellaneous data releases**.
- 910

Selected Presentations

2023 **Data science for water resource decision making**, *MRV Ross*, Invited - Boise State University.

2023 **The future of hydrology education**, *MRV Ross*, Invited - CUAHSI Biennial.

2023 **Challenges in synthesis catchment science: An introduction to MacroSheds**, *N Gubbins; M Vlah, S Rhea, W Slaughter, A Thellman, N Marzolf, A DelVecchia, MRV Ross, ES Bernhardt*, Hacking Limnology 2023 Virtual Summit and Workshops.

2023 **Cameron Peak Wildfire riverine and reservoir water quality impacts**, *S Struthers; MRV Ross, C Rhoades, K Willi, T Fegel*, CSU Hydrology Days 2023.

2023 **Macroscale watershed science (Workshop)**, *MJ Vlah, W Slaughter, S Rhea, N Gubbins, ES Bernhardt, MRV Ross*, Hacking Limnology.

2023 **Leveraging a densely monitored watershed to disentangle catchment controls on whole-network streamflow to develop optimal stream gage placement strategies**, *FY Cheng, K Willi, MRV Ross*, Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry.

2023 **An assessment of annual load estimation methods in small watersheds for cross site comparisons**, *N Gubbins; W Slaughter, M Vlah, S Rhea, ES Bernhardt, MRV Ross*, Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology, and Geochemistry.

2023 **Life after fire (Workshop)**, *S Struthers; MRV Ross, C Rhoades, K Willi, T Fegel*, Cameron Peak Fire Reservoir Water Quality Study.

2022 **From dissonance to harmony in big environmental datasets**, *MRV Ross*, Invited - University of Nevada, Reno.

2022 **Remote sensing of water quality for management and science**, *MRV Ross*, Invited - University of Florida, Gaineseville.

2022 **Putting microorganisms on the map: A continental scale context for microbial genomes sampled from North American watersheds**, *M Borton, K Willi, A Oliverio, R Daly, T Bambakidis, M Shaffer, J Rodriguez-Ramos, L Schöpflin, RE Danczak, AE Goldman, EM Wood-Charlson, MJ Wilkins, S Roux, E Eloe-Fadrosh, BC Crump, C Henry, MRV Ross, J Stegen, K Wrighton*, AGU Fall Meeting.

2022 **Novel landforms: Towards a systematic incorporation of people into geomorphology**, *AE Braswell, JM Mallard, MRV Ross*, AGU Fall Meeting.

2022 **MacroSheds: Enabling continental-scale comparison of watershed biogeochemistry**, *M Vlah, W Slaughter, S Rhea, N Gubbins, ES Bernhardt, MRV Ross*, AGU Fall Meeting.

2022 **MacroSheds: Integrated watershed data for the United States**, *S Rhea, M Vlah, W Slaughter, ES Bernhardt, MRV Ross*, Joint Aquatic Science Meeting.

2022 **Accessing and exploring integrated watershed data through the MacroSheds portal**, *M Vlah, S Rhea, ES Bernhardt, W Slaughter, N Gubbins, AG DelVecchia, A Thellman, MRV Ross*, Joint Aquitic Sciences Meeting.

2022 **Improved capabilities in small-basin rainfall-runoff modeling**, *M Vlah, S Rheam, A Thellman, ES Bernhardt, MRV Ross*, AGU Frontiers in Hydrology.

2022 **"Big" catchment data**, *M Vlah, S Rhea, ES Bernhardt, W Slaughter, N Gubbins, AG DelVecchia, A Thellman, MRV Ross*, AGU Fall Meeting.

2022 **What the flux? Using high frequency and spatially diverse data to improve flux estimation methods**, *N Gubbins, S Rhea, W Slaughter, M Blah, A DelVecchia, MRV Ross, ES Bernhardt*, American Geological union Frontiers in Hydrology Summer Meeting.

2022 **Reservoir water quality post-Cameron Peak Fire**, *S Struthers, MRV Ross, C Rhoades, K Willi, T Fegel*, Grand County Post-Fire Science, Research, and Monitoring (SRM) Fall Meeting.

2021 **Using environmental big data to understand, manage, and better design freshwater ecosystems**, *MRV Ross*, Invited - University of California Santa Barbara Bren School.

2021 **Remote sensing of chlorophyll and secchi depth in Lake Yojoa, Honduras: The opportunities and limitations of machine learning using spectral bands in a large tropical lake affected by industrial-scale aquaculture**, *J Fadum, MRV Ross, EK Hall, S Topp*, AGU Fall Meeting.

2021 **Putting microorganisms on the map: Continental-scale context for thousands of newly sampled microbial genomes from North American watersheds**, *KC Wrighton, M Borton, K Willi, R Flynn, R Daly, T Bambakidis, A Oliverio, M Shaffer, J Rodriguez-Ramos, L Schöpflin, RE Danczak, AE Goldman, EM Wood-Charlson, C Henry, MJ Wilkins, S Roux, E Eloe-Fadrosh, J Stegen, B C Crump, MRV Ross*, AGU Fall Meeting.

2021 **Seasonality and asynchrony of bank vegetation and riverine suspended sediment concentrations in global deltas**, *JM Mallard, T Pavelsky, EB Goldstein, S Topp, MRV Ross*, AGU Fall Meeting.

2021 **Drivers of declining suspended sediment concentrations across US rivers**, *J Gardner, T Pavelsky, X Yang, S Topp, MRV Ross*, AGU Fall Meeting.

2021 **Massive critical zone manipulation: What we can learn about watershed storage and streamflow response from events to years**, *F Nippgen, MRV Ross, ES Bernhardt, BL McGlynn, E Moore*, AGU Fall Meeting.

2021 **Mapping flow-obstructing structures on global rivers**, *X Yang, T Pavelsky, MRV Ross, S Januchowski-Hartley, W Dolan, EH Altenau, Michael Belanger, DK Byron, MT Durand, IV Dusen, H Galit, M Jorissen, T Langhorst, E Lawton, R Lynch, KA McQuillan, S Pawar, A Whittemore*, AGU Fall Meeting.

2021 **Putting the BIO in hydroBIOgeochemistry: Current knowledge and future directions of river microbiome science**, *M Borton, A Pelly, K Willi, J Rodríguez-Ramos, AE Goldman, K Wrighton, BC Crump, MRV Ross, J Stegen*, AGU Fall Meeting.

2020 **Matched-up, the importance of open-access training data for global-scale remote sensing of water quality**, *MRV Ross*, Invited - Workshop on Knowledge Guided Machine Learning at University of Minnesota.

2020 **From printing press to pdfs, the limits of papers in scholarly communication and open science**, *MRV Ross*, Virtual Summit on Incorporating Data Science and Open Science Techniques in Aquatic Research.

2020 **Multi-decadal increases in US lake water clarity**, *SN Topp, TM Pavelsky, EH Stanley, X Yang, CG Griffin, MRV Ross*, Ecological Society of America Virtual Conference.

2020 **High frequency population ecology using pairs of chlorophyll a sensors on a Great Plains river**, *NE Bruns, MRV Ross, M Doyle*, AGU Fall Meeting.

2020 **Macroscale water color patterns in large US rivers**, *J Gardner, X Yang, S Topp, MRV Ross, T Pavelsky*, AGU Fall Meeting.

2020 **Assessing distance learning in the hydrologic sciences: Key takeaways from student and instructor surveys during and after the transition to online teaching**, *S Herzog, AS Ward, J Bales, RT Barnes, NB Basu, TP Covino, EH Habib, SP Loheide III, J Maertens, L Yoder, J Masterman, MRV Ross*, AGU Fall Meeting.

2020 **Frontiers in water quality science I**, *MJ Cohen, J Blaszczak, MRV Ross, ET Hester*, AGU Fall Meeting.

2020 **Frontiers in water quality science II eLightning**, *MJ Cohen, J Blaszczak, MRV Ross*, AGU Fall Meeting.

2020 **Global patterns and drivers of lake color**, *X Yang, JR Gardner, C O'Reilly, T Pavelsky, MRV Ross, S Topp, J Wang*, AGU Fall Meeting.

2020 **Sensitivity of floodplain vegetation to interannual climate variability in Southern Rocky Mountain river networks**, *AC Brooks, TP Covino, RR Morrison, A Annis, F Nardi, MRV Ross*, AGU Fall Meeting.

2020 **Are wild and scenic river watersheds "wild"? Assessing streamflow and water quality beyond the designated corridor**, *K Willi, SK Kampf, MRV Ross, J Back*, AGU Fall Meeting.

2019 **Trends and patterns in riverine suspended sediment concentrations across the continental USA revealed by satellite remote sensing**, *J Gardner, MRV Ross, SN Topp, X Yang, TM Pavelsky*, AGU Fall Meeting.

2019 **Our fragmented rivers — mapping human-made river obstructions around the globe**, *X Yang, M Belanger, DK Byron, W Dolana, H Galit, S Januchowski-Hartley, M Jorrisen, T Langhorst, E Lawton, KA McQuillan, T Pavelsky, S Pawar, MRV Ross, A Whittemore*, AGU Fall Meeting.

2019 **Lakes as integrators: Multi-decadal fluctuations in regional lake water clarity and seasonality across the US**, *SN Topp, TM Pavelsky, MRV Ross, EH Stanley, X Yang*, AGU Fall Meeting.

2019 **Remotely sensed discharge and sediment flux of the Sagavanirktok River**, *T Langhorst, TM Pavelsky, SN Topp, MRV Ross, C Dai, MT Durand, RPM Frasson, I Howat*, AGU Fall Meeting.

2018 **What can 34 years of imagery tell us about suspended sediment dynamics and controls in large rivers?**, *MRV Ross, SN Topp, AP Appling, X Yang, J Gardner, T Pavelsky*, AGU Fall Meeting.

2018 **The ecology of a designed ecosystem: Legacies in the man-made mountains of Appalachia**, *MRV Ross*, CU-Boulder Ecology Symposium.

2018 **Novel approaches to understanding spatial and temporal variation in water quality**, *MRV Ross*, CU-Boulder Civil and Environmental Engineering Symposium.

2018 **How variable is the variability in annual evapotranspiration?**, *MRV Ross, PC Stoy*, AGU Fall Meeting.

2018 **Fifty years of inland water remote sensing: Moving from methods to applications**, *S Topp, T Pavelsky, MRV Ross, D Jensen*, AGU Fall Meeting.

2018 **The construction and validation of a citizen science derived Global River Obstruction Database (GROD)**, *A Whittemore, MRV Ross, X Yang, W Dolan, T Langhorst, T Pavelsky, S Januchowski-Hartley*, AGU Fall Meeting.

2017 **Hyperspectral imaging of water quality - past applications and future directions**, *MRV Ross, T Pavelsky*, AGU Fall Meeting.

2017 **Deconstructing the deconstruction of Appalachia: Mountaintop mining effects on hydrology across temporal and spatial scales**, *F Nippgen, MRV Ross, ES Bernhardt, BL McGlynn*, AGU Fall Meeting.

2017 **Yesterday's forest, tomorrow's savannah? Legacies in the man-made hills of Appalachia (Invited)**, *MRV Ross, F Nippgen, BL McGlynn, ES Bernhardt*, AGU Fall Meeting.

2016 **Old mountains, new nutrients: Mountaintop mining's impact on watershed scale nitrogen export**, *AC Brooks, MRV Ross, F Nippgen, ES Bernhardt, BL McGlynn*, AGU Fall Meeting.

2016 **Mountaintop removal mining: From ephemeral to perennial streams**, *F Nippgen, MRV Ross, ES Bernhardt, BL McGlynn*, AGU Fall Meeting.

2016 **Melting mountains of Appalachia: Exceptionally high weathering rates in mined watersheds**, *MRV Ross, F Nippgen, Brooke Hassett, BL McGlynn, ES Bernhardt*, AGU Fall Meeting.

2015 **When everything changes: Mountaintop mining effects on watershed hydrology (Invited)**, *F Nippgen, MRV Ross, BL McGlynn, ES Bernhardt*, AGU Fall Meeting.

2014 **Process domains in synthetic landscapes: Slope-area relationships in the mountaintop mining region of Central Appalachia**, *KL Jaeger, MRV Ross*, AGU Fall Meeting.