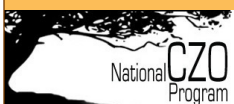




CZO@AGU 2019

December 9-13, 2019
San Francisco, CA



CRITICAL ZONE OBSERVATORIES
studying the zone where rock meets life

funded by NSF



Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
Monday, 9 December 2019			
08:00-12:20	PA11C: The Catchments Behind the Data and the Process Behind the Catchments Posters Moscone South- Poster Hall	PA11C-0962: A catchment in the transitional snow zone: Gordon Gulch, Boulder Creek Critical Zone Observatory ANDERSON, S.P. ; HINCKLEY, E.S.; RAGAR, D.; GILL, N.; PARRISH, E.G.	Boulder Creek
08:00-12:20	PA11C: The Catchments Behind the Data and the Process Behind the Catchments Posters Moscone South – Poster Hall	PA11C-0965: Reynolds Creek Experimental Watershed and Critical Zone Observatory SEYFRIED, M.S. ; LOHSE, K.A.; PIERSON, F.B.; FLERCHINGER, G.N.; MARKS, D.G.	Reynolds Creek
08:00-12:20	PA11C: The Catchments Behind the Data and the Process Behind the Catchments Posters Moscone South – Poster Hall	PA11C-0979: The Calhoun Critical Zone Observatory: historic hydrologic research in a complex socio-environmental context reinvigorated and expanded by critical zone science MALLARD J.M. ; ZIMMER, M.A.; DEB RICHTER, D.; MCGLYNN, B.L.	Calhoun
08:00-12:20	PA11C: The Catchments Behind the Data and the Process Behind the Catchments Posters Moscone South – Poster Hall	PA11C-0988: Catchment science in the montane tropics: Luquillo CZO and LTER LEON, M. ; MCDOWELL, W.H.; WYMORE, A.; DALEY SHATTUCK, M.	Luquillo
08:00-12:20	H11J: Centennial Session: Current Advances and Future Challenges in Hydrologic Science III Posters Moscone South – Poster Hall	H11J-1630: How Ready Is The Hydrologic Sciences For the Loss of Seasonal Snowpacks (And What Can Be Done)? HARPOLD, A.A. ; BROOKS, P.D.; KOHLER, M.; STURTEVANT, J.; GORDON, B.; DETTINGER, M.D.	Catalina-Jemez
08:00-12:20	H11J: Centennial Session: Current Advances and Future Challenges in Hydrologic Science III Posters Moscone South – Poster Hall	H11J-1631: Forgotten Interactions: Missing Link in the Ecohydrologic Prediction Puzzle KUMAR, M. ; KRAPU, C.; LIU, Y.; PAROLARI, A.; KATUL, G.G.; PORPORATO, A.M.; BORSUK, M.E.	Calhoun
08:00-12:20	H11P: Blue and Green Water in the Mountains: Water Supply, Extreme Events, and Ecological Responses in Snow- and Glacier-Fed Catchments II Posters Moscone South – Poster Hall	H11P-1746: Influence of snow accumulation and ephemerality on recent tree mortality in the Sierra Nevada CASIRATI, S. ; SAFEEQ, M.; CONKLIN, M.H.	Southern Sierra
08:45-09:00	H11B: Advances in Quantifying Impacts and Extents of Land Use/Land Cover Change and Other Landscape Disturbances on Hydrology I Moscone West – 3014, L3	H11B-04: Ecosystem thermodynamic response to human-induced perturbations RICHARDSON, M. ; KUMAR, P.	IML

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
Monday, 9 December 2019 - continued			
09:32-09:46	H11D: Advances in Subsurface Characterization and Monitoring Using Geophysical and Hydrogeological Methods I Moscone West – 2022-2024, L2	H11D-07: Probing shale weathering under ridge and valley: an integrated approach from geochemistry to geophysics GU, X. ; MAVKO, G.; ACCARDO, N.J.; CARR, B.; NYBLADE, A.; BRANTLEY, S.L.	Shale Hills
10:50-11:05	B12B: Carbon and Nutrient Cycle Interactions in Terrestrial Ecosystems: Integrating Theory, Observations, Experiments, and Models II Moscone West – 3003, L3	B12B-03: Aeolian Particulate Matter as a Source of Bioavailable P to Sierra Nevada Soil BARNES, M.E. ; BERHE, A.A.; HART, S.C.; O'DAY, P.A.; YOUNG, R.P.	Southern Sierra
11:50-12:05	B12A: Advances in Understanding Water–Carbon Interactions I Moscone West – 3007, L3	B12A-07: Fine root production and tree basal area effects on early-growing season soil CO₂ efflux across a mesic temperate forest catchment PRIMKA, E.J. ; ADAMS, T.S.; ORR, A.S.; REED, W.; KAYE, J.P.; EISSENSTAT, D.M.	Shale Hills
13:40-15:40	PA13A: Communicating with Appropriate Urgency: How to Connect with Audiences in a Time of Accelerating Change eLightning Theater I Moscone South – eLightning Theater I	PA13A-06: Using the Story of a Gallon of Gasoline to Astound, Scare, and Build the Hope and Courage Necessary to Face Climate Change DUGGAN-HAAS, D. ; ZABEL, I.H.H.; MOORE, A.; ROSS, R.M.;	National Office
13:40-18:00	B13K: Observing and Modeling the Influence of Disturbance on Ecological, Biogeochemical, and Hydrological Processes: Toward a Predictive Understanding II Posters Moscone South – Poster Hall	B13K-2608: Detecting Climate-Stress Induced Forest Mortality Before the Canonical Symptoms Appear KUMAR, M. ; LIU, Y.; KATUL, G.G.; PORPORATO, A.M.	Calhoun
13:40-18:00	B13E: Carbon and Nutrient Cycle Interactions in Terrestrial Ecosystems: Integrating Theory, Observations, Experiments, and Models III Posters Moscone South – Poster Hall	B13E-2541: The effects of drought and hurricanes on soil biogeochemistry in a wet tropical forest in Puerto Rico GUTIÉRREZ DEL ARROYO, O. ; SILVER, W.L.	Luquillo
13:40-18:00	B13E: Carbon and Nutrient Cycle Interactions in Terrestrial Ecosystems: Integrating Theory, Observations, Experiments, and Models III Posters Moscone South – Poster Hall	B13E-2549: Modeling soil nutrients, microbial biomass, and soil activity in areas undergoing woody shrub encroachment GEBHARDT, M. ; GALLERY, R.E.	Catalina-Jemez

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
Monday, 9 December 2019 - continued			
13:40-18:00	B13E: Carbon and Nutrient Cycle Interactions in Terrestrial Ecosystems: Integrating Theory, Observations, Experiments, and Models III Posters Moscone South – Poster Hall	B13E-2558: Belowground carbon varied with aboveground carbon along an elevation gradient at Southern Sierra Critical Zone Observatory in California YANG, Y. ; HART, S.C.; KELLY, A.; TIAN, Z.; MORELAND, K.C.; GOULDEN, M.; BALES, R.C.; HUNSAKER, C.T.; BERHE, A.A.	Southern Sierra
13:40-18:00	PA13B: The Catchments Behind the Data and the Process Behind the Catchments Posters Moscone South – Poster Hall	PA13B-1021: Southern Sierra Critical Zone Observatory: a Hub for Multi- and Interdisciplinary Research on Soil Development, Forest Water Use, and Biogeochemistry in the Sierra Nevada, California STACY, E.; GILMORE, M.E.; SAFEEQ, M.; MENG, X.; BALES, R.C.	Southern Sierra
13:40-18:00	H13O: Human Influence on the Regional/Natural Hydroclimate II Posters Moscone South – Poster Hall	H13O-1951: Spatial and temporal patterns of summer vegetative water stress resulting from snow drought GRAUP, L. ; TAGUE, C.	Southern Sierra
14:10-14:30	H13A: Advances in Subsurface Characterization and Monitoring Using Geophysical and Hydrogeological Methods III Moscone West – 2022-2024, L2	H13A-03: Progress and challenges in investigating the fate of water stored in the fractured bedrock vadose zone (Invited) REMPE, D.M.	Eel River
14:30-14:40	B13C: Centennial Session: Biogeosciences at the Threshold of the Next Centennial: State of the Art and What We Still Need to Learn About Our Living Planet I Moscone West – 3003, L3	B13C-06: Biogeochemistry of soil organic matter in dynamic landscapes BERHE, A.A.	Southern Sierra
14:40-14:55	H13E: Drought: Dynamics, Impacts, Resilience, and Adaptation I Moscone West – 3022, L3	H13E-05: Shifts in Annual Precipitation-Runoff Relationships during Multi-Year Droughts in a Mediterranean Mixed Rain-Snow Climate are Driven by Evapotranspiration Feedbacks AVANZI, F.; RUNGEE, J.P.; MAURER, T. ; BALES, R.C.; MA, Q.; GLASER, S.D.; CONKLIN, M.H.	Southern Sierra
15:00-15:20	H13D: Centennial Session: Current Advances and Future Challenges in Hydrologic Science I Moscone West – 3014, L3	H13D-05: Characterizing causal dependencies through information flow: emerging frontier for understanding and prediction of earth system dynamics KUMAR, P. ; GOODWELL, A.E.; JIANG, P.; RUDELL, B.L.	IML

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
16:00-18:00	PA14B: Bringing Science Down to Earth: Using Storytelling, Personal Narratives, and Multichannel Media to Advance Awareness and Use of Earth Science in Communities Worldwide eLightning Moscone South – eLightning Theater I	PA14B-11: From Science to Conservation: Using Community Outreach and Video Storytelling to Explore Career Paths in Environmental Sustainability FAIRBANKS, D.; REED, S.	Catalina-Jemez
17:40-18:00	H14C: Centennial Session: Current Advances and Future Challenges in Hydrologic Science II Moscone West – 3014, L3	H14C-06: Do we need to account for dynamic changes in subsurface plumbing to project blue water stocks and fluxes? SULLIVAN, P.L.; BILLINGS, S.A.; HIRMAS, D.; LI, L.; FLORES, A.N.; SENA, M.G.; WEN, H.; OKESON, M.; NASH, C.; SOUZA, L.; LANG, K.	Calhoun

Tuesday, 10 December 2019

08:00-10:00	ED21B: Scientists, Artists, and the Earth: Cooperating for the Planet II eLightning Moscone South – eLightning Theater I	ED21B-16: Future Mountain: An interactive visualization of people, fire, water and climate in forested landscapes CHOATE, J.; TAGUE, C.; TURPIN, E.; GORDON, D.; BART, R.R.; KENNEDY, M.C.; BURKE, W.	Southern Sierra
08:00-12:20	H21J: Characterizing Spatial and Temporal Variability of Hydrological and Biogeochemical Processes Across Scales II Posters Moscone South – Poster Hall	H21J-1870: Transport Induced Mineral Dissolution Through Intensive Hydrological Cycles in Incipient Basalt Hillslopes MOLLANEDA, J.; WANG, Y.; AMISTADI, M.K.; ROOT, R.A.; TROCH, P.A.; CHOROVER, J.	Catalina-Jemez
08:00-12:20	PA11C: The Catchments Behind the Data and the Process Behind the Catchments Posters Moscone South – Poster Hall	PA11C-0954: The Kings River Experimental Watersheds: resolving processes in Sierra Nevada headwaters since 2002 WAGENBRENNER, J.; SAFEEQ, M.; BART, R.R.; HUNSAKER, C.T.	Southern Sierra
08:00-12:20	NS21C: Near-surface geophysics in the critical zone Moscone South – Poster Hall	NS21C-0818: Non-Invasive investigation of water content in trees using high-resolution ground-penetrating radar (GPR) measurements in the Luquillo Mountains (Luquillo Critical Zone Observatory; CZO) VECCHIO, M.; COMAS, X.; TURAMURATOVA, U.; BROCARD, G.Y.; HARRISON, E.J.; SIRIANNI, M.; BECKER, J.	Luquillo

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
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Tuesday, 10 December 2019 - continued

8:00-12:20	NS21C: Near-Surface Geophysics in the Critical Zone III Posters Moscone South – Poster Hall	NS21C-0834: Imaging the structure of solifluction lobes in the Garner Run Subcatchment of the Susquehanna Shale Hills Critical Zone Observatory using 2D Seismic Refraction Tomography TARZON, A.; CASTELO, A.; DEL VECCHIO J.; DONALDSON, Y.Y.; CAMBEIRO, J.; MURRAY, H.; HAYES, J.L.; MOUNT, G.; KEATING, K.; BRANTLEY, S.L.; NYQUIST, J.	Shale Hills
08:00-12:20	NS21C: Near-Surface Geophysics in the Critical Zone III Posters Moscone South – Poster Hall	NS21C-0835: The Use of Electrical Resistivity Tomography (ERT) to Image Solifluction Lobes in the Garner Run Subcatchment of the Susquehanna Shale Hills Critical Zone Observatory RODRIGUEZ, A.; CAMBEIRO, J.; TARZONA, A.; MURRAY, H.; DONALDSON, Y.Y.; DEL VECCHIO, J.; HAYES, J.L.; MOUNT, G.; KEATING, K.; BRANTLEY, S.L.; NYQUIST, J.; DIBIASE, R.A.	Shale Hills
8:00-12:20	NS21C: Near-Surface Geophysics in the Critical Zone III Posters Moscone South – Poster Hall	NS21C-0836: The use of ERI and Seismic refraction to constrain soil depth and geologic structure at Cole Farms Agricultural Site in the Susquehanna Shale Hills Critical Zone Observatory CAMBEIRO, J.; SILVERHART, P.; DONALDSON, Y.Y.; TARZONA, A.; MURRAY, H.; KEATING, K.; MOUNT, G.; HAYES, J.L.; BRANTLEY, S.L.; DIBIASE, R.A.; NYQUIST, J.	Shale Hills
08:00-12:20	B21G: Advances in Understanding Water-Carbon Interactions III Posters Moscone South – Poster Hall	B21G-2410: Simulating water-carbon interactions in a Mediterranean mountain ecosystem using a dynamic global vegetation model GUO, W.; SAFEEQ, M.; BALES, R.C.; CUI, G.; MA, Q.	Southern Sierra
08:00-12:20	B21G: Advances in Understanding Water–Carbon Interactions III Posters Moscone South – Poster Hall	B21G-2416: Climate Change Impacts on Water and Carbon Fluxes along an Elevational Gradient in a Sagebrush Ecosystem FLERCHINGER, G.N.; FELLOWS, A.; SEYFRIED, M.S.; CLARK, P.; LOHSE, K.A.	Reynolds Creek
08:00-12:20	B21H: Aligning Soil Organic Matter Mechanisms, Measurements, and Models Across Scales: Honoring the Complexity of Soil Processes II Posters Moscone South – Poster Hall	B21H-2303: Spatial differences and temporal change in organic matter composition across artificial hillslope during incipient soil formation DONTSOVA, K.; TFAILY, M.M.; HUNT, E.; CHU, R.K.; TOYODA, J.; CHOROVER, J.; TROCH, P.A.	Catalina-Jemez

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
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Tuesday, 10 December 2019 - continued

08:00-12:20	B21I: Controls, Dynamics, and Responses of Deep Soil Carbon to Land Use and Climate Change II Posters Moscone South – Poster Hall	B21I: Controls, Dynamics, and Responses of Deep Soil Carbon to Land Use and Climate Change II Posters LOHSE, K.A.; TANG, J.; ROQUE-MALO, S.; DERE, A.L.D.; FAIRBANKS, D.	Reynolds Creek IML Catalina-Jemez
08:00-12:20	B21I: Controls, Dynamics, and Responses of Deep Soil Carbon to Land Use and Climate Change II Posters Moscone South – Poster Hall	B21I-2435: Leveraging soil geochemistry and soil carbon dynamics at the Critical Zone and Ecosystem Observatory at Nivolet; Gran Paradiso National Park; Italy to project future alpine ecosystem functioning BANESCHI, I. ; DENTON DERE, A.L.; ARONSON, E.L.; BALINT, R.; BILLINGS, S.A.; DONATO, A.; GIAMBERINI, M.; MAGNANI, M.; MOSCA, P.; PENNISI, M.; PROVENZALE, A.; RACO, B.; WHITE, T.S.	Calhoun National Office
08:00-12:20	B21I: Controls, Dynamics, and Responses of Deep Soil Carbon to Land Use and Climate Change II Posters Moscone South – Poster Hall	B21I-2439: Using apparent respiratory quotient and fixed potential electrodes to quantify iron redox in upland soils of the Susquehanna Shale Hills Critical Zone Observatory HODGES, C.A. ; REGAN, J.M.; FORSYTHE, B.; BRANTLEY, S.L.; KAYE, J.P.	Shale Hills
08:00-12:20	B21I: Controls, Dynamics, and Responses of Deep Soil Carbon to Land Use and Climate Change II Posters Moscone South – Poster Hall	B21I-2441: Biological Cycling of Potassium by Roots as a Control on Mixed-layer Clays AUSTIN, J.; SCHROEDER, P.A. ; DEB RICHTER, D.	Calhoun
08:00-12:20	B21J: Plants-Microbes-Minerals: Interactions That Drive Soil Organic Matter Cycling II Posters Moscone South – Poster Hall	B21J-2332: Buried woodchips or biochar as a means of soil productivity and carbon restoration: Effects on microbial activities, soil carbon cycling and plant cover in a semiarid ecosystem ESPINOSA, N.J. ; MOORE, D.J.P.; RASMUSSEN, C.; FEHMI, J.S.; GALLERY, R.E.	Catalina-Jemez
08:00-12:20	B21J: Plants-Microbes-Minerals: Interactions That Drive Soil Organic Matter Cycling II Posters Moscone South – Poster Hall	B21J-2335: A coupled reactive transport and ecohydrologic modeling approach to root-soil-microbe interactions in the Critical Zone ROQUE-MALO, S. ; KUMAR, P.; DRUHAN, J.L.	IML
08:00-12:20	B21K: Soil Carbon Change and Persistence in the Anthropocene: Results from Empirical, Modeling, Synthesis, and Long-Term Studies IV Posters Moscone South – Poster Hall	B21K-2343: Belowground production and contribution of recent plant detritus to soil organic matter pools in montane meadows of the Sierra Nevada HART, S.C.	Southern Sierra

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Tuesday, 10 December 2019 - continued

08:04-08:18	U21A: Probing and Modeling Reactive Transport Processes in Earth Systems Moscone South – 303-304, L3	U21A-01: What Clay and Pyrite Grains Reveal about Water and Oxygen Transport in a Shale During Weathering (Invited) BRANTLEY, S.L. ; GU, X.	Shale Hills
10:50-11:05	B22E: Tree Drought Stress and Mortality: The Interplay of Climate, Physiology, Hydrology, and Lithology I Moscone West – 3003, L3	B22E-03: Mountain ecosystem response to drought moderated by lithologic and climatic controls on subsurface water-storage capacity RIEBE, C.S. ; CALLAHAN, R.P.	Southern Sierra
12:05-12:20	B22E: Tree Drought Stress and Mortality: The Interplay of Climate, Physiology, Hydrology, and Lithology I Moscone West – 3003, L3	B22E-08: Self-thinning decreases the effect of subsequent drought on forest dieback NORLEN, C.A. ; GOULDEN, M.	Southern Sierra
13:40-18:00	IN23D: Achieving the "R" of the FAIR Data Principles: Reusability Is the Biggest Challenge but the Most Rewarding! II Posters Moscone South – Poster Hall	IN23D-0903: Increasing reusability of Critical Zone data with CUAHSI HydroShare and CZ Manager LEON, M. ; LUBINSKI, D.J.; BODE, C.A.; MARINI, L.; SEUL, M.; DERRY, L.A.; MCDOWELL, W.H.	Luquillo National Office Eel River
13:40-18:00	NH23C: The Role of Fire in the Earth System: Understanding Drivers, Feedbacks, and Interactions with the Land, Atmosphere, and Society II Posters Moscone South – Poster Hall	NH23C-1040: Spatiotemporal patterns and environmental controls on increasing wildfires in Sierra Nevada, California CHEN, B. ; JIN, Y.; SCADUTO, E.; MORITZ, M.; GOULDEN, M.; RANDERSON, J.T.	Southern Sierra
13:40-18:00	ED23F: Beyond the Walls: Stimulating the Earth Science Educational Experience II Posters Moscone South – Poster Hall	ED23F-1080: Field and Professional Development for Environmental Students: Outcomes of the ESTEM Program and Lessons Learned About Undergraduate Career Preparation During and Following a Field Program WALKER, B.; HALL, S.R. ; SCHMIDT, C.M.; PAUL, J.R.	Southern Sierra
13:40-18:00	S23D: Environmental Seismology: A Geophysical Tool to Study Surface and Near-Surface Processes IV Posters Moscone South – Poster Hall	S23D-0677: Soil Soundscapes from Seismic Arrays: Monitoring Bioturbation in Mima Mounds and Hillslopes WELLINGTON CLOW, T. ; WILLENBRING, J.K.; GONZÁLEZ, G.; SHEARER, P.M.	Luquillo
13:40-13:55	NS23A: Near-Surface Geophysics in the Critical Zone I Moscone West – 2012, L2	NS23A-01: Seismic full waveform inversion procedure for characterizing critical zone subsurface structure: a case study at the Susquehanna Shale Hills CZO HUANG, C. ; ZHU, T.; HAYES, J.L.	Shale Hills

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
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Tuesday, 10 December 2019 - continued

13:55-14:10	NS23A: Near-Surface Geophysics in the Critical Zone I Moscone West – 2012, L2	NS23A-02: 2D seismic imaging in the Susquehanna Shale Hills Critical Zone Observatory: New constraints on subsurface structure and weathering MA, L. ; ACCARDO, N.J.; NYBLADE, A.; GU, X.; MOUNT, G.; BRANTLEY, S.L.	Shale Hills
14:40-14:55	NS23A: Near-Surface Geophysics in the Critical Zone I Moscone West – 2012, L2	NS23A-05: Strong lithologic and climatic control on deep subsurface weathering revealed in landscape-scale porosity distributions CALLAHAN, R.P. ; RIEBE, C.S.	Southern Sierra
15:10-15:25	NS23A: Near-Surface Geophysics in the Critical Zone I Moscone West – 2012, L2	NS23A-07: Seismic Ambient Noise and Electrical Resistivity Imaging of Subsurface Water Changes in the Susquehanna Shale Hills CZO, Pennsylvania OAKLEY, D. ; NYBLADE, A.; BRANTLEY, S.L.; ACCARDO, N.J.; FORSYTHE, B.; HODGES, C.A.; REGAN, J.M.; KAYE, J.P.	Shale Hills
16:30-16:45	NS24A: Near-Surface Geophysics in the Critical Zone II Moscone West – 2012, L2	NS24A-02: Linking near surface geophysics to critical zone architecture and biogeochemical processes MORAVEC, B.G. ; ROOT, R.; CARR, B.; WHITE, A.M.; MCINTOSH, J.C.; CHOROVER, J.	Catalina-Jemez
17:00-17:15	NS24A: Near-Surface Geophysics in the Critical Zone II Moscone West – 2012, L2	NS24A-04: Where is the bottom of the critical zone? Evidence for deep, stacked critical zones from airborne EM and hydrological models in Reynolds Creek CZO HOLBROOK, S. ; RABAK, I.; CONDON, L.E.; SEYFRIED, M.S.	Reynolds Creek
17:15-17:30	NS24A: Near-Surface Geophysics in the Critical Zone II Moscone West – 2012, L2	NS24A-05: Linking erosion rates and critical zone architecture using geophysical surveys at multiple spatial scales (Luquillo CZO, PR) COMAS, X. ; BROCARD, G.Y.; HARRISON, E.J.; VECCHIO, M.; SIRIANNI, M.; BECKER, J.; WRIGHT, W.; BRANTLEY, S.L.; MCDOWELL, W.H.	Luquillo
17:15-17:30	B24E: Tropical Forests Under a Changing Environment II Moscone West – 3003, L3	B24E-06: Humid tropical forest soils retained high phosphorus sorption under anoxic conditions LIN, Y. ; GROSS, A.; O'CONNELL, C.; SILVER, W.L.	Luquillo
17:30-17:45	B24E: Tropical Forests Under a Changing Environment II Moscone West – 3003, L3	B24E-07: Oscillating Redox Conditions Controlled Greenhouse Gas Dynamics in Wet Tropical Forest Soils SIHI, D. ; ZHENG, J.; BRENNER, J.; PHILLIPS, J.R.; SINGH, S.; PETT-RIDGE, J.; JAGADAMMA, S.; LÓPEZ-LLOREDA, C.; MAYES, M.A.	Luquillo

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
17:30-17:45	C24B: Observations, Interactions, and Implications of Permafrost Systems in Transition II Moscone West – 3024, L3	C24B-07: Incorporating the Seasonal Snowpack into Thermo-Hydrologic Modeling of Frozen Ground at Niwot Ridge, CO RUSH, M. ; RAJARAM, H.	Boulder Creek
17:45-18:00	NS24A: Near-Surface Geophysics in the Critical Zone II Moscone West – 2012, L2	NS24A-07: Imaging changes in living ponderosa pine tree trunk moisture with multi-offset ground-penetrating radar data MANGEL, A.R. ; SINGHA, K.	Boulder Creek

Wednesday, 11 December 2019

08:00-12:20	H31I: Application of Artificial Intelligence/Machine Learning to Enhance Process Understanding of Pristine and Agriculture-Intensive Watersheds II Posters Moscone South – Poster Hall	H31I-1829: Using Information Flow for Whole System Understanding from Component Dynamics JIANG, P. ; KUMAR, P.; CHEN, X.; SHUAI, P.	IML
11:20-11:35	B32D: Soil Carbon Change and Persistence in the Anthropocene: Results from Empirical, Modeling, Synthesis, and Long-Term Studies II Moscone West – 3003, L3	B32D-05: Soil Organic Matter Molecular Composition Reveals Tradeoffs in Mechanisms of C Persistence Among Ecosystems in the NEON Network HALL, S.J. ; YE, C.; HOCKADAY, W.C.; WEINTRAUB, S.R.	Luquillo
12:05-12:20	H32G: Wildfire Effects on Water Resources, Landscapes, and Ecosystems II Moscone West – 3014, L3	H32G-08: Influence of wildfire disturbances on solute mobilization through the critical zone SANCHEZ, R.A. ; MEIXNER, T.; MCINTOSH, J.C.; CHOROVER, J.	Catalina-Jemez
13:40-18:00	B33J: Tropical Forests Under a Changing Environment III Posters Moscone South – Poster Hall	B33J-2613: Observations of Water; Energy and CO2 Fluxes at Calhoun Critical Zone Observatory ZHU, M. ; TANG, Y.; WANG, J.; MARKEWITZ, D.; BRAS, R.L.; JING, W.	Calhoun CZO
13:40-18:00	B33J: Tropical Forests Under a Changing Environment III Posters Moscone South – Poster Hall	B33J-2618: Simulating the Damages and Recovery of a Tropical Rainforest from Hurricane Disturbances with the Ecosystem Demography Biosphere Model ZHANG, J. ; BASTOLA, S.; HEARTSILL SCALLEY, T.; BRAS, R.L.	Luquillo
13:40-18:00	B33J: Tropical Forests Under a Changing Environment III Posters Moscone South – Poster Hall	B33J-2623: The Response of Dissolved Inorganic Nutrients to Hurricanes Irma and María at the Luquillo Critical Zone Observatory LARA, M.C. ; MCDOWELL, W.H.; MA, L.; SHAW, M.	Luquillo

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
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Wednesday, 11 December 2019 - continued

13:40-18:00	C33B: Modeling of the Cryosphere: Seasonal Snow II Posters Moscone South – Poster Hall	C33B-1564: Snow-canopy interactions during rain-on-snow events using Random Forest MAURER, T. ; AVANZI, F.; SAFEEQ, M.; GLASER, S.D.; BALES, R.C.	Southern Sierra
13:40-18:00	B33F: Addressing Spatial-Temporal Variation, Plasticity, and Acclimation of Key Hydraulic and Photosynthetic Plant Traits for Predicting Forest Responses to Climate Change II Posters Moscone South – Poster Hall	B33F-2538: Understanding the interplay of rooting strategy and plant hydraulic traits on the response of forest stands to climate variation of California DING, J. ; BUOTTE, P.; KOVEN, C.; KUEPPERS, L.M.; XU, C.; FISHER, R.; KNOX, R.G.; CHRISTOFFERSON, B.; GOULDEN, M.	Southern Sierra
13:40-18:00	B33F: Addressing Spatial-Temporal Variation, Plasticity, and Acclimation of Key Hydraulic and Photosynthetic Plant Traits for Predicting Forest Responses to Climate Change II Posters Moscone South – Poster Hall	B33F-2543: Relative importance of vegetation and topography in explaining ecosystem response to fire disturbance TAI, X. ; BROOKS, P.D.; ANDEREGG, W.; LITVAK, M.E.; CHOROVER, J.	Catalina-Jemez
13:40-18:00	H33H: Advances in Ecohydrology of Water-Limited Environments: The Role of Rain, Snow, Fog, Dew, and Water Vapor III Posters Moscone South – Poster Hall	H33H-2017: Effects of drought and defoliation on moisture and energy balances in a tropical mountain cloud forest SCHOLL, M.A. ; VAN BEUSEKOM, A.; BASSIOUNI, M.; TORRES-SANACHEZ, A.	Luquillo
13:40-18:00	H33M: Modeling Hydrological Processes and Changes Under a Changing Environment II Posters Moscone South – Poster Hall	H33M-2151: Assessment of hydrologic impacts of climate change in the Sierra Nevada: comparisons between radiative change and CO2 fertilization SAFEEQ, M. ; LIVNEH, B.; BART, R.R.; SINGH, C.K.; SHUKLA, S.	Southern Sierra
13:40-18:00	EP33C: Earth Surface Processes and the Global Carbon Cycle III Posters Moscone South – Poster Hall	EP33C-2353: Co-evolution of soil organic carbon and landscapes in intensively engineered landscapes YAN, Q. ; KUMAR, P.	IML
13:40-18:00	EP33C: Earth Surface Processes and the Global Carbon Cycle III Posters Moscone South – Poster Hall	EP33C-2360: Topography Controls Spatial Variability of Soil Organic Carbon in High- and Low-gradient Agriculture Landscapes ZHOU, S.; PAPANICOLAOU, T. ; WILSON, C.G.	IML
13:40-18:00	EP33E: The Role and Relevance of Thresholds and Variability Across Landscapes II Posters Moscone South – Poster Hall	EP33E-2375: Interactions among hydrologic and geomorphic thresholds in fluvial landscape evolution ROSSI, M.W. ; ANDERSON, R.S.; ANDERSON, S.P.; TUCKER, G.E.	Boulder Creek

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Wednesday, 11 December 2019 - continued

13:55-14:10	EP33A: Catching Cosmic Rays: Advances in Using Cosmogenic Nuclides to Quantify Earth Surface Processes I Moscone West – 3009, L3	EP33A-02: Changes in the rates of weathering and soil production following transient erosion in the Rio Blanco watershed; Puerto Rico (Invited) HARRISON, E.J. ; WILLENBRING, J.K.; BROCARD, G.Y.; DOSSETO, A.; CODILEAN, A.; FULOP, R.K.; WILCKEN, K.	Luquillo
15:25-15:40	B33C: Plants-Microbes-Minerals: Interactions That Drive Soil Organic Matter Cycling I Moscone West – 3003, L3	B33C-08: Dry season changes in soil carbon composition: tracking decomposability; mobility; and chemistry over a Mediterranean-type summer VAUGHN, L.S. ; SANTOS, F.; WAHAB, L.M.; BERHE, A.A.; DAWSON, T.E.	Eel River
16:00-18:00	B34E: Agricultural Systems: Links Between Hydrology and Biogeochemical Cycling IV eLightning Moscone South – eLightning Theater III	B34E-12: Tillage driven erosion: a transport mediated filter of organic carbon across intensively managed landscapes HOU, T. ; FILLEY, T.R.; TONG, Y.; ABBAN, B.K.; SINGH, S.; PAPANICOLAOU, T.; WACHA, K.; WILSON, C.G.; CHAUBEY, I.	IML
16:00-18:00	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I LOHSE, K.A.; TANG, J.; ROQUE-MALO, S.; DERE, A.L.D.; FAIRBANKS, D.	Reynolds Creek IML Catalina-Jemez
16:00-16:15	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B-01: Anthropogenic Declines in Deep Roots Constrain Deep Soil Organic Carbon Forms and Fluxes BILLINGS, S.A. ; SULLIVAN, P.L.; SOUZA, L.; HAUSER, E.; LOECKE, T.; LANG, K.; RICE, C.W.; HIRMAS, D.; DEB RICHTER, D.; CHERKINSKY, A.; MARKEWITZ, D.	Calhoun
16:15-16:30	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B-02: Controls of iron abundance and crystallinity on organomineral associations under contrasting long-term land use THOMPSON, A. ; COWARD, E.K.; MARKEWITZ, D.; DEB RICHTER, D.; BACON, A.R.; PLANTE, A.F.	Calhoun
16:15-16:30	H34F: Runoff Generation Processes: Integrating Observations and Hydrological and Geomorphological Processes over Variable Scales I Moscone West – 3014, L3	H34F-02: Storage volume and depth drives runoff generation in a deep and highly weathered headwater watershed MALLARD, J.M. ; MCGLYNN, B.L.; DEB RICHTER, D.	Calhoun

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16:41-16:49	ED34A: Actions and Perspectives on Diversity, Inclusion, and Equity in the Earth and Space Sciences in the Classroom Moscone South – 216, L2	ED34A-04: Broadening Participation and Engagement of Underrepresented Minorities in the Geosciences Through a Near Surface Geophysics Field Experience KEATING, K. ; MOUNT, G.; ALTERMATT, E.; O'CONNELL, K.; HAYES, J.L.; BRANTLEY, S.L.; GATES, A.E.; NYQUIST, J.; IVERSON, E.A.R.	Shale Hills
16:45-17:00	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B-04: Identifying the organic and inorganic products of incipient weathering in natural environments LYBRAND, R. ; AUSTIN, J.; CHU, R.K.; QAFOKU, O.; RESCH, T.; ROONEY, E.; SCHROEDER, P.A.; TFAILY, M.M.; TOYODA, J.; SHUTTHANANDAN, V.; ZAHARESCU, D.G.; BERGMANN, M.; PIERCE, B.; GALLERY, R.E.	Calhoun Catalina-Jemez
17:00-17:15	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B-05: A reactive transport framework for the co-evolution of rhizodeposition and mineral weathering below soil (Invited) DRUHAN, J.L. ; TUNE, A.K.; WANG, J.J.; REMPE, D.M.	Eel River
17:30-17:45	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B-07: Spatial Distribution and Prediction of Hillslope Soil Organic Carbon (Invited) PATTON, N.R. ; LOHSE, K.A.; SEYFRIED, M.S.; GODSEY, S.; PARSONS, S.	Reynolds Creek
17:45-18:00	B34B: Controls, Dynamics, and Responses of Deep-Soil Carbon to Land Use and Climate Change I Moscone West – 3003, L3	B34B-08: Climatic Controls on Deep Soil Organic Carbon Persistence Across a Bioclimatic Gradient in California MORELAND, K.C. ; TIAN, Z.; MCFARLANE, K.J.; O'GEEN, A.T.; BERHE, A.A.	Southern Sierra

Thursday, 12 December 2019

08:00-08:15	C41B: Quantifying Spatial and Temporal Variability of Snow and Snow Processes I Moscone West – 2006, L2	C41B-01: Mountain Precipitation Patterns in Mixed Rain-Snow Areas from a Distributed Wireless-Sensor Network and a Random Forest Model CUI, G. ; BALES, R.C.; CONKLIN, M.H.; RICE, R.; AVANZI, F.; HARTSOUGH, P.C.; GUO, W.	Southern Sierra
08:00-10:00	B41F: Tropical Mountains and Forests: Understanding Processes and Interactions Between Land, Atmosphere, Plants, and Water Across Disciplines II eLightning Theater II Moscone South – eLightning Theater II	B41F-04: Forest cover mitigates the impacts of rainfall variability on streamflow in Puerto Rico HALL, J. ; URIARTE, M.; SCHOLL, M.A.	Luquillo

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Thursday, 12 December 2019 - continued

08:00-12:20	B41I: Microbes in Terrestrial Biogeochemical Cycles: Linking Processes to Ecosystem Function and Environmental Change II Posters Moscone South – Poster Hall	B41I: Microbes in Terrestrial Biogeochemical Cycles: Linking Processes to Ecosystem Function and Environmental Change II Posters ESPINOSA, N.J.; GEBHARDT, M.; FAIRBANKS, D.; GALLERY, R.E.	Catalina-Jemez
08:00-12:20	B41K: Surface-Atmosphere Interactions: Advances in Analysis and Scaling of Surface-Atmosphere Fluxes II Posters Moscone South – Poster Hall	B41K-2495: Understanding the Role of Land-Cover Heterogeneity on the Land-Atmospheric Interactions Inside the Footprint of a Tall Flux Tower HERNANDEZ RODRIGUEZ, L.C. ; GOODWELL, A.E.; KUMAR, P.	IML
08:00-12:20	H41Q: Stable Isotopes in the Critical Zone: Methods, Applications, and Process Interpretations II Posters Moscone South – Poster Hall	H41Q-1969: Spatial and temporal patterns of tree water uptake between catchments of contrasting lithologies TANG, Q. ; DUNCAN, J.M.; EISSENSTAT, D.M.	Shale Hills
08:00-12:20	PA41D: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? II Posters Moscone South – Poster Hall	PA41D: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? II Posters GAILLARDET, J.; KRZYWOSZYNSKA, A.; WHITE, T.S.; RINAUDO, J.D.	National Office
08:00-12:20	PA41D: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? II Posters Moscone South – Poster Hall	PA41D-1137: Bridging Chinese Landscape Painting and geosciences DUAN, H. ; JIANG, J.; LI, M.	Shale Hills
08:00-12:20	H41K: Groundwater Discharge to Surface Waters: Patterns, Processes, and Ecological Implications II Posters Moscone South – Poster Hall	H41K-1855: Influence of Baseflow on Stream Drying in a Semi-Arid Watershed WARIX, S.R. ; GODSEY, S.; LOHSE, K.A.; HALE, R.L.	Reynolds Creek
08:00-12:20	H41L: Hydrological Sensing Systems and Networks II Posters Moscone South – Poster Hall	H41L-1877: Dendra: a real-time cloud-based time-series curation system BODE, C.A. ; SMITH, J.S.	Eel River
08:00-12:20	A41N: Dust in a Changing Climate: From Small-Scale Insights to Large-Scale Understanding III Posters Moscone South – Poster Hall	A41N-2842: African Dust Incursions at the Caribbean Region: Dust Concentration; Chemical Characterization and Their Impact to Fungal Spore Concentrations SANTOS-FIGUEROA, G. ; AVILÉS-PIÑEIRO, G.M.; BOLAÑOS-ROSETO, B.; MAYOL-BRACERO, O.L.	Luquillo

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Thursday, 12 December 2019 - continued

08:30-08:45	H41A: Advancing Science and Environmental Change Detection: Leveraging Long-Term Observations, Monitoring, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies I Moscone West – 3016, L3	H41A-03: Forest density reduction impacts on productivity, water use and drought resilience TAGUE, C. ; MORITZ, M.; KLEIN, T.	Southern Sierra
08:30-08:45	EP41B: Fluvial Morphodynamics, Channel Patterns, and Beyond I Moscone West – 3009, L3	EP41B-03: Dynamic architecture and the restructuring of subsurface flow in the Critical Zone of the Luquillo Mountains; Puerto Rico HARRISON, E.J. ; WILLENBRING, J.K.; BROCARD, G.Y.; LYONS, N.J.; GASPARINI, N.J.	Luquillo
09:00-09:15	B41A: Fire in the Environment: Pyrogenic Organic Matter Cycling and Environmental Impacts Across Watersheds I Moscone West – 3012, L3	B41A-05: Remobilization of historical mine waste to water supplies after wildfire (Invited) MURPHY, S.F. ; MCCLESKEY, R.B.; HOLLOWAY, J.M.; MARTIN, D.A.; WRITER, J.H.	Boulder Creek
09:15-09:30	EP41A: Earth Surface Processes and the Global Carbon Cycle I Moscone West – 3011, L3	EP41A-06: The Dimensionless Groups of Chemical Weathering: Disentangling the Role of Hydroclimatic and Geological Factors CALABRESE, S. ; PORPORATO, A.M.	Calhoun
10:20-10:35	B42D: Soil Carbon Change and Persistence in the Anthropocene: Results from Empirical, Modeling, Synthesis, and Long-Term Studies III Moscone West – 3003, L3	B42D-01: Rooting Depths Change on a Global Scale in the Anthropocene HAUSER, E. ; SULLIVAN, P.L.; BILLINGS, S.A.	Calhoun
10:20-10:35	H42A: Advancing Science and Environmental Change Detection: Leveraging Long-Term Observations, Monitoring, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies II Moscone West – 3016, L3	H42A-01: The Soil and Critical Zone Clay Factory: How Rock Weathers to Clay and Clay-Sized Minerals DEB RICHTER, D.	Calhoun
11:35-11:50	H42A: Advancing Science and Environmental Change Detection: Leveraging Long-Term Observations, Monitoring, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies II Moscone West – 3016, L3	H42A-06: Long-term trends in dissolved organic matter from fluvial systems across biomes RODRIGUEZ-CARDONA, B. ; WYMORE, A.; ARGREICH, A; JOHNSON, S.L.; KORTELIANEN, P.; DODDS, W.K.; JONES, J.; MCDOWELL, W.H.	Luquillo

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Thursday, 12 December 2019 - continued

11:50-12:05	EP42A: Earth Surface Processes and the Global Carbon Cycle II Moscone West – 3011, L3	EP42A-07: Tracing rhenium in the Shale Hills Critical Zone Observatory: Insights on understanding rock organic carbon weathering OGRIC, M. ; DELLINGER, M.; WILLIAMS, J.; BRANTLEY, S.L.; HILTON, R.G.	Shale Hills
12:30-13:30	TH43C: The Critical Zone: Observatory Progress and New Opportunities Moscone West – 2003, L2	TH43C: The Critical Zone: Observatory Progress and New Opportunities WHITE, T.S.; DIETRICH, W.E.; LOHSE, K.	Cross-CZO
13:40-13:55	B43B: Agricultural Systems: Links Between Hydrology and Biogeochemical Cycling I Moscone West – 3007, L3	B43B-01: Soil erosion and burial control soil C reactivity and interaction with extractable metals in a Midwestern agricultural floodplain FILLEY, T.R. ; HOU, T.; PENG, X.; KUMAR, P.; YAN, Q.; FOSTER, E.J.	IML
13:40-18:00	H43G: Advancing Science and Environmental Change Detection: Leveraging Long-Term Observations, Monitoring, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies III Posters Moscone South – Poster Hall	H43G-2061: Critical Zone Measurements: Development of Novel Experimental Deployments to Further Our Understanding of Hydrological Processes FORSYTHE, B. ; HARPER, J.; BRANTLEY, S.L.; REGAN, J.M.; HODGES, C.A.; KAYE, J.P.; NYBLADE, A.	Shale Hills
13:40-18:00	H43G: Advancing Science and Environmental Change Detection: Leveraging Long-Term Observations, Monitoring, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies III Posters Moscone South – Poster Hall	H43G-2067: Fuel treatment effects on forest mortality resistance and water yield during drought BART, R.R. ; SAFEEQ, M.; WAGENBRENNER, J.; HUNSAKER, C.T.	Southern Sierra
13:40-18:00	H43G: Advancing Science and Environmental Change Detection: Leveraging Long-Term Observations, Monitoring, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies III Posters Moscone South – Poster Hall	H43G-2088: A comparison of transit time distribution vs. fraction of young water to characterize storage in a mountain headwater catchment: does the tail matter? DWIVEDI, R. ; EASTOE, C.J.; KNOWLES, J.K.; MCINTOSH, J.C.; MEIXNER, T.; FERRE, T.P.A.; MINOR, R.L.; BARRON-GAFFORD, G.; ABRAMSON, N.; STANLEY, M.; CHOROVER, J.	Catalina-Jemez
13:40-18:00	H43K: Exploring Linkages Between Headwaters and Groundwaters for Human and Ecosystem Uses in a Changing Climate II Posters Moscone South – Poster Hall	H43K-2182: Determining Water Age of Rivers and Plant-Accessible Water in California's Headwaters During Hydrologic Extremes THAW, M. ; VISSER, A.; BIBBY, R.K.; DEINHART, A.; SHARP, M.; OERTER, E.; CONKLIN, M.H.	Southern Sierra

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Thursday, 12 December 2019 - continued

13:40-18:00	H43L: Critical Zone Across Scales: Fate, Transport, and Remediation of Contaminants from Nanocolloids to Trace Metals and Their Transformation Products VII Posters Moscone South – Poster Hall	H43L-2203: Hydrologic mixing model based on weathering chemistry identifies saprolite as the source of inorganic colloids in a granitoid catchment HOFFMAN, N. ; ANDERSON, S.P.; WING, B.A.	Boulder Creek
13:40-18:00	EP43D: Landslides and Landscape Evolution: Mechanisms and Feedbacks II Posters Moscone South – Poster Hall	EP43D-2399: The role of small shallow landslides in landscape evolution as revealed by high resolution differential lidar surveys and field mapping SANDERS, M. ; NELSON, M.D.; BRYK, A.B; HUANG, M.H.; FAURIA, K.; DIETRICH, W.E.	Eel River
13:40-18:00	EP43E: Signatures of Environmental Signals on Earth's Surface and Subsurface II Posters Moscone South – Poster Hall	EP43E-2402: Quantifying the relative importance of physical and chemical weathering in saprolite porosity production across a steep climate gradient GRANKE, S.B-M. ; RIEBE, C.S.	Southern Sierra
13:40-15:40	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I GAILLARDET, J.; KRZYWOSZYNSKA, A.; WHITE, T.S.; RINAUDO, J.D.	National Office
13:48-13:55	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A-02: Putting the Study of the Earth Surface Back Together Again with Critical Zone Science (Invited) BRANTLEY, S.L.	Shale Hills
14:02-14:09	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A-04: Impact of Socio-Economic Drivers on the Critical Zone of Intensively Managed Agricultural Landscapes KUMAR, P.	IML
14:44-14:51	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A-10: Understanding and valuing sustainability in the critical zone BALES, R.C. ; CONKLIN, M.H.; KUMAR, P.; NIKOLAIDIS, N.; CHOROVER, J.; MCDOWELL, W.H.	Southern Sierra IML Catalina-Jemez Luquillo
15:05-15:12	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A-13: Extended Realities - opportunities for increasing public awareness of critical zones BAGHER, M.M.; SAJJADI, P.; GREENLEES, K.; MYRICK, J.; SWIM, J.K.; WHITE, T.S.; KLIPPEL, A.	National Office
15:10-15:25	EP43A: Fluvial Morphodynamics, Channel Patterns, and Beyond III Moscone West – 3009, L3	EP43A-07: Observing the influences of critical zone architecture on streamflow generation processes: A granitic mountain-meadow headwater system in a Mediterranean climate CONKLIN, M.H. ; KLOS, P.Z.; LUCAS, R.G.	Southern Sierra

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15:12-15:19	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A-14: Designing a critical zone research coordination network to promote diversity, equity, and inclusion (Invited) SULLIVAN, P.L. ; GASPARINI, N.M.; WEST, N.; SINGHA, K.; Li, L.	CZ RCN
15:26-15:33	PA43A: Critical Zone Science: From Natural to Social Sciences, Economics, Politics, and Art? I Moscone South – 301-302, L3	PA43A-16: What is soil? An integrative exploration of a Critical material NELSON, D.R. ; COUGHLAN, M.R.; PORPORATO, A.M.; DEB RICHTER, D.	Calhoun
16:15-16:30	H44A: Advances in Ecohydrology of Water-Limited Environments: The Role of Rain, Snow, Fog, Dew, and Water Vapor II Moscone West – 3014, L3	H44A-02: Occult Water: a medium that connects the atmosphere to plants and ecosystems (Invited) DAWSON, T.E. ; WEATHERS, K.C.; PONETTE-GONZÁLEZ, A.	Eel River

Friday, 13 December 2019

08:00-12:20	H51P: Changing Snow Regime and Hydrologic Extremes in Alpine-Dominated Watersheds I Posters Moscone South – Poster Hall	H51P-1697: Toward a process-based understanding of precipitation-phase impacts on streamflow ASGHAR, Z. ; OROZA, C.; THOMPSON, S.E.; FENG, X.; BOISRAMÉ, G.F.S.; RAY, R.L.; SKILES, M.; BALES, R.C.	Southern Sierra
08:00-12:20	GC51I: Dust and the Climate System: Investigating Interactions over Multiple Timescales II Posters Moscone South – Poster Hall	GC51I-0956: Deposition of water and nutrients in a Caribbean cloud forest influenced by aerosols from different sources TORRES-DELGADO, E. ; MAYOL-BRACERO, O.L.	Luquillo
08:00-12:20	B51M: Scientific Surprises from Sensors: What Have We Learned About Ecosystem Science from Advancement of in situ Sensors? Moscone South – Poster Hall	B51M-2421: Ecosystem recovery from a major hurricane: insights from high-frequency aquatic sensors WYMORE, A. ; SHANLEY, J.B.; MCDOWELL, W.H.	Luquillo
08:15-08:30	H51A: Advances in Isotopic, Trace Element, and Noble Gas Tracers of Hydrologic Processes I Moscone West – 3020, L3	H51A-02: Disentangling age distributions of long-screened production wells for quantifying mountain-block recharge MARKOVICH, K.H. ; CONDON, L.E.; KUBICKI, C.W.; CARROLL, K.C.; MCINTOSH, J.C.	Catalina-Jemez
09:24-09:33	B51E: Improving Ecosystem Carbon Budget Estimates and Forging Linkages for Informing Decisions I Moscone West – 3003, L3	B51E-09: How to Estimate Statistically Detectable Trends in a Time Series: A Study of Soil Carbon and Nutrient Concentrations at the Calhoun LTSE (Invited) DEB RICHTER, D. ; MOBLEY, M.L.; YANG, Y.; NELSON, K.A.; BACON, A.R.; HEINE, P.	Calhoun

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Friday, 13 December 2019 - continued

10:50-11:05	EP52B: Size, Incise, and Deposit: Controls on Bedrock Erosion and Sediment Export from Large River Basins I Moscone West – 3011, L3	EP52B-03: How do channel-hillslope feedbacks modulate river canyon evolution? (Invited) GLADE, R. ; SHOBE, C.M.; ANDERSON, R.S.; TUCKER, G.E.	Boulder Creek
11:05-11:20	B52B: Exploring Microbial Ecosystems Using Cutting-Edge Advances in Isotope and Omics Analyses I Moscone West – 3005, L3	B52B-04: Stable Isotope Probing Reveals the Influence of Changing Redox Periodicity on Microbial Community Structure and Function in a Wet Tropical Forest Soil HESTRIN, R. ; CAMPBELL, A.; KIMBREL, J.; BHATTACHARYYA, A.; TRUBL, G.G.; LIN, Y.; SILVER, W.L.; NICO, P.S.; BLAZEWICZ, S.; PETT-RIDGE, J.	Luquillo
11:35-11:50	B52C: Forest Disturbance in the Context of Shifting Climate: Understanding Disturbances and Their Interactions as Agents of Forest Change I Moscone West – 3001, L3	B52C-06: Wildfire Controls on Water and Carbon Balance in California's Sierra Nevada MA, Q. ; GOULDEN, M.; BALES, R.C.; CONKLIN, M.H.	Southern Sierra
13:40-15:40	B53B: Microbes in Terrestrial Biogeochemical Cycles: Linking Processes to Ecosystem Function and Environmental Change I Moscone West – 3005, L3	B53B: Microbes in Terrestrial Biogeochemical Cycles: Linking Processes to Ecosystem Function and Environmental Change I ESPINOSA, N.J.; GEBHARDT, M.; FAIRBANKS, D.; GALLERY, R.E.	Catalina-Jemez
13:40-18:00	H53P: Hydrochronology: Advances in Tracer Methods and Modeling of Residence Times in Hydrology II Posters Moscone South – Poster Hall	H53P-2032: New Techniques for Cosmogenic Radioactive Age Tracers: Sodium-22 and Sulfur-35 DEINHART, A. ; THAW, M.; BIBBY, R.K.; VISSER, A.; THOMAS, K.J.	Southern Sierra
13:40-18:00	H53P: Hydrochronology: Advances in Tracer Methods and Modeling of Residence Times in Hydrology II Posters Moscone South – Poster Hall	H53P-2045: Hydrochronology and watershed-scale reactive solute transport VISSER, A. ; VAN DER VELDE, Y.; THAW, M.	Southern Sierra
13:40-18:00	H53O: General Surface Hydrology and Catchment Science II Posters Moscone South – Poster Hall	H53O-2022: Multiscale Routing – Integrating the Tree-scale Effects of Disturbance into a Watershed Ecohydrologic Model BURKE, W. ; TAGUE, C.	Southern Sierra

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Friday, 13 December 2019 - continued

13:40-18:00	EP53F: Earth and Planetary Surface Processes General Contributions I Posters Moscone South – Poster Hall	EP53F-2197: Rethinking the Development of the Piedmont Upland of Southeastern North America: Pleistocene Age Colluvium and Organic-Rich Sediments Dating from Early MIS 3 to MIS 5 FERGUSON, T.A. ; BACON, A.R.; EPPES, M.C.; DEB RICHTER, D.; WILLARD, D.A.; NELSON, M.; BILLINGS, S.A.; AUSTIN, J.	Calhoun
13:40-18:00	EP53F: Earth and Planetary Surface Processes General Contributions I Posters Moscone South – Poster Hall	EP53F-2206: Land use versus climate controls on erosion at a farmed headwater catchment in central Pennsylvania SILVERHART, P. ; DIBIASE, R.A.; WALTER, R.C.; MOUNT, G.; KEATING, K.; HAYES, J.L.	Shale Hills
13:40-18:00	EP53F: Earth and Planetary Surface Processes General Contributions I Posters Moscone South – Poster Hall	EP53F-2213: Investigating Hillslope Self-Similarity: Field Observations of Weathering Profiles Across a Sequence of Repeating Ridges and Valleys PEDRAZAS, M. ; HAHM, W.J.; HUANG, M.H.; NELSON, M.D.; BRYK, A.B.; DRALLE, D.; FAURIA, K.; DIETRICH, W.E.; REMPE, D.M.	Eel River
13:40-18:00	EP53H: Particle-Scale Dynamics in Earth and Planetary Surface Evolution and How They Scale Up to System Dynamics II Posters Moscone South – Poster Hall	EP53H-2276: Developing a Process-based Sediment Transport Model to Capture the Interplay between Particle-scale Dynamics, Geomorphic Evolution and Fluxes in Intensively Managed Landscapes GIANNOPOULOS, C. ; PAPANICOLAOU, T.; ABBAN, B.K.; WILSON, C.G.	IML
13:40-18:00	EP53I: Size, Incise, and Deposit: Controls on Bedrock Erosion and Sediment Export from Large River Basins II Posters Moscone South – Poster Hall	EP53I-2250: Knick zone formation and migration by plucking of blocks at edges of steps HURST, A.A. ; ANDERSON, R.S.; CRIMALDI, J.P.	Boulder Creek
13:40-18:00	B53N: Tree Drought Stress and Mortality: The Interplay of Climate, Physiology, Hydrology, and Lithology II Posters Moscone South – Poster Hall	B53N-2587: Tree mortality during the 2012-2016 California drought: role of climate and lithology LIU, X. ; FUNG, I.Y.; BILIR, E.	Eel River
13:40-18:00	B53N: Tree Drought Stress and Mortality: The Interplay of Climate, Physiology, Hydrology, and Lithology II Posters Moscone South – Poster Hall	B53N-2589: The role of sub-surface storage capacities in drought mortality patterns along a hillslope in the Sierra Nevada, California HECKMAN, C. ; TAGUE, C.	Southern Sierra

Time of Presentation	Session/Location Information	Presentation Title/Author(s)	Affiliation
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Friday, 13 December 2019 - continued

13:40-18:00	B53N: Tree Drought Stress and Mortality: The Interplay of Climate, Physiology, Hydrology, and Lithology II Posters Moscone South – Poster Hall	B53N-2594: The effect of temperature and ontogeny on the physiological mechanism of drought-induced tree mortality in pines ADAMS, H. ; HAMMOND, W.; DICKMAN, L.T.; BARRON-GAFFORD, G.; LAW, D.; ANDEREGG, W.; ANDEREGG, L.D.L.; SEVANTO, S.; POCKMAN, W.; MCDOWELL, N.; BRESHEARS, D.D.; HUXMAN, T.E.	Catalina-Jemez
14:25-14:40	ED53A: Climate Literacy: Bringing Climate Change Science Curricula, Pedagogy, and Research to K–12 Educators, Preservice Teachers, and Students I Moscone South – 215, L2	ED53A-04: Grappling With Special Challenges of Teaching Our Most Important Content DUGGAN-HAAS, D. ; ZABEL, I.H.H.; MOORE, A.; ROSS, R.M.; RANGASAMMY, G.; WHITE, T.S.	National Office
15:25-15:40	EP53B: Landslides and Landscape Evolution: Mechanisms and Feedbacks I Moscone West – 3011, L3	EP53B-08: Factors contributing to hurricane-induced landslides in Puerto Rico: Implications for hazards and sediment mobilization SCHULZ, W.H. ; HUGHES, S.K.; BESSETTE-KIRTON, E.; CEROVSKI-DARRIAU, C.; MARTINEZ MILLIAN, G.O.; BAYOUTH GARCIA, D.; THOMAS, M.A.; BAUM, R.L.	Luquillo
16:00-16:15	EP54B: Earth 4D: A Deep Dive into the Habitability of the Blue Planet I Moscone West – 3009, L3	EP54B-01: Earth's hidden hydrogeosphere: Distribution, evolution, and circulation of meteoric waters at depth in the earth's crust through Critical Zone (Invited) MCINTOSH, J.C.	Catalina-Jemez
17:00-17:15	EP54A: Connectivity: An Integrating Concept Across Process Domains in Geomorphology and Study of the Earth's Surface I Moscone West – 3011, L3	EP54A-05: Connections between shallow and deep structure of an extrusive critical zone influence hydrochemical response CHOROVER, J. ; MORAVEC, B.G.; WHITE, A.M.; ROOT, R.; OLSHANSKY, Y.; MCINTOSH, J.C.	Catalina-Jemez
17:00-17:15	H54G: The Role of Soil Moisture in Land-Atmosphere Interactions II Moscone West – 3024, L3	H54G-05: Modelling the effects of climate-responsive soil parameters on continental-scale hydrologic stores and fluxes in the Community Land Model (CLM) 5.0 NASH, C. ; FLORES, A.N.; SULLIVAN, P.L.; HIRNAS, D.; BILLINGS, S.A.; LI, L.; WEN, H.	Calhoun
17:12-17:24	B54A: Geovirology: Viruses in Earth's Biomes and Their Impacts on Microbial Ecology and Biogeochemistry I Moscone West – 3005, L3	B54A-04: Characterizing virus activity; persistence; and virus-host dynamics in Arctic and Tropical soils using stable isotope probing targeted metagenomics TRUBL, G.G. ; CAMPBELL, A.; KAMBREL, J.; WALDROP, M.P.; PETT-RIDGE, J.; BLAZEWICZ, S.	Luquillo