

Products

Title: 2025 Mentor Institute: Featured Program Panel

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: 2025 Mentor Institute: Featured Program Panel

Abstract:

Forum Name: HDRFS Mentor Institute 2025

Details:

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Alissa Gardner / University of Nevada-Las Vegas

Joanna Jezierska / University of Nevada-Las Vegas

Aster Sigel / Nevada State College

Nicole Thomas / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Achieving byzantine-resilient federated learning via layer-adaptive sparsified model aggregation

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Achieving byzantine-resilient federated learning via layer-adaptive sparsified model aggregation

Abstract:

Forum Name: 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)

Details:

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Rui Hu / University of Nevada-Reno

Authors Imported from DOI:

Title: Achieving Byzantine-Resilient Federated Learning via Layer-Adaptive Sparsified Model Aggregation

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-02-26

Peer Reviewed: No

URL: <https://doi.org/10.1109/wacv61041.2025.00154>

Title: Achieving Byzantine-Resilient Federated Learning via Layer-Adaptive Sparsified Model Aggregation

DOI: 10.1109/wacv61041.2025.00154

Forum Name: 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)

Details:

Publisher: IEEE

Event: 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)

Page: 1508-1517

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Rui Hu / University of Nevada-Reno

Zikai Zhang / University of Nevada-Reno

Authors Imported from DOI:

Title: Agenda Networking Event Spring 2025

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event Agenda

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Agenda Networking Event Spring 2025

Abstract:

This event has been designed for students to give the opportunity to listen and interact in a panel interview, consisting of data analytics employers and to able to ask questions about job opportunities and suggestions. After the panel discussion, an informal coffee and donuts hangout will take place where students can spend more time meeting the employers.

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Agenda_NetworkingEvent_2025-3.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: A machine learning framework to measure Water Drop Penetration Time (WDPT) for soil water repellency analysis

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-10-28

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.mlwa.2024.100595>

Title: A machine learning framework to measure Water Drop Penetration Time (WDPT) for soil water repellency analysis

Abstract:

The heat from wildfires volatilizes soil's organic compounds which form a waxy layer when condensed on cooler soil particles causing soil to repel water. Timely assessment of soil water repellency (SWR) is critical for prediction and prevention of detrimental impacts of hydrophobic soils such as soil erosion, reduced availability of water to plants, and water runoff after rainfalls leading to floods. The Water Drop Penetration Time (WDPT), i.e., the time elapsed from a drop landing on the soil surface to its complete absorption is commonly used to assess the SWR level. Its manual measurements have variability based on the used instruments and subjective observations. The goal of this work is to design an automated system to perform standardized WDPT tests and assess the SWR levels. It consists of an electronically controlled mechanism to release a water drop, and a video camera to record the water penetration process. The latter is modeled as an "action" in video and Temporal Action Localization (TAL) analytics is used for predicting the WDPT and assessing the SWR level.

Forum Name: Machine Learning with Applications

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: Wang&a_2024_MachineLearningAppl_WDPT.pdf

Contributors:

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Emma Regentova / University of Nevada-Las Vegas

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Authors Imported from DOI:

Title: A mixing rule for imaginary parts of refractive indices of aerosols or colloids in the Rayleigh regime

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-01-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.jqsrt.2024.109254>

Title: A mixing rule for imaginary parts of refractive indices of aerosols or colloids in the Rayleigh regime

DOI: 10.1016/j.jqsrt.2024.109254

Forum Name: Journal of Quantitative Spectroscopy and Radiative Transfer

Details:

Publisher: Elsevier BV

Volume: 331

Issue:

Page: 109254

ISSN: 0022-4073

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

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Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Justin B. Maughan

Christopher M. Sorensen

Title: A Sorptivity-modified Green-Ampt (SGA) model for simulating infiltration into initially dry, variably-wettable sand

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: Yes

URL:

Title: A Sorptivity-modified Green-Ampt (SGA) model for simulating infiltration into initially dry, variably-wettable sand

Abstract:

Infiltration is an important process in multiple disciplines including hydrology, ecology and agronomy. Process-based infiltration models are available for wettable but not for water repellent soils. The goal of this study was to develop a process-based infiltration model for initially dry, variably-wettable sand by incorporating water repellency (WR) into the Green-Ampt infiltration equation using sorptivity. This “Sorptivity-modified Green and Ampt (SGA)” model was used to demonstrate the effect of WR on infiltration using sorptivity values of initially dry silica sand with three different levels of WR as input. Additionally, we explored the effect of WR on the hydraulic conductivity of the same sand. SGA model simulations showed the pronounced impact of WR on infiltration with decreasing infiltration rates for increasing WR; even for contact angles less than 90°. The effect of WR on infiltration rate was particularly strong for contact angles >70° and for low amounts of cumulative infiltration. The latter are typical conditions at the beginning of a rainfall event or during short-duration, high-intensity storms. Infiltration measurements and SGA model simulations also indicated that WR has a greater effect on sorptivity than on hydraulic conductivity, further emphasizing the importance of sorptivity for modeling infiltration into variably-wettable sand. Although developed for initially dry, variably-wettable sand the SGA model could serve as a first step toward a process-based infiltration model for soils of any texture.

Forum Name: Geophysical Research Letter

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Markus Berli / Desert Research Institute

Rose Shillito / USACE Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL),

Authors Imported from DOI:

Title: Assessing the climate impact of an improved volcanic sulfate aerosol representation in E3SM

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-07-08

Peer Reviewed: Yes

URL: <https://gmd.copernicus.org/articles/18/4137/2025/>

Title: Assessing the climate impact of an improved volcanic sulfate aerosol representation in E3SM

Abstract:

Accurately simulating historical surface temperature variations is essential for evaluating climate models, yet many struggle to reproduce the mid-20th-century temperature trends associated with significant volcanic eruptions. This study examines the impact of volcanic sulfate aerosol representation on these biases using the Energy Exascale Earth System Model (E3SM). The standard CMIP6 protocol prescribes volcanic forcing through radiative perturbations, omitting volcanic aerosol–cloud interactions (VACIs). Here, we implement an emission-based approach with an updated volcanic eruption inventory that directly incorporates volcanic sulfur dioxide (SO₂) emissions, enabling a more process-based representation of volcanic forcing. This approach leads to improved surface temperature variability and a modest reduction in cold biases between 1940 and 1980 compared to the CMIP6 setup. Additionally, we assess cloud property responses to a more realistic volcanic sulfate aerosol representation, which weakens cloud-induced cooling during periods of lower volcanic activity. However, despite these refinements, a significant temperature cold bias remains, indicating that further improvements in atmospheric chemistry, aerosol microphysics, cloud processes, and model parameterizations are needed to fully resolve this issue in E3SM

Forum Name: Geoscientific Model Development

Details:

Copilot Search Branding

Global web icon

GMD

<https://www.geoscientific-model-development.net>

Geoscientific Model Development - GMD - Home

Geoscientific Model Development (GMD) is a not-for-profit international scientific journal dedicated to the publication and public discussion of the description, development, and evaluation...

Submission

Title page: the title page must include the title (concise but informative, including ...

Peer-review process

Interactive public discussion, peer review, and publication in GMD The process of i...

Editor's choice

Our proposed model can significantly assist avalanche forecasters in their dec...

Policies

By submitting a manuscript, the authors certify that they have read and agreed t...

Editorial board

Dr. Xiaohong Liu is a Professor and the Reta Haynes Chair in Geosciences at Te...

Scheduled SIs

Coupled Model Intercomparison Project Phase 7 (CMIP7) forcings and inputs – ...

Do statistical downscaling techniques preserve expected co-variances during convective precipitation?

Common statistical downscaling techniques preserve expected co-variances during convective precipitation (a stationary phenomenon). However, they dampen future intensification of frontal precipitation (a non-stationary phenomenon) captured in global climate models and dynamical downscaling.

geoscientific-model-development.net

Tutorial: Machine learning models for geoscience - YouTube

Thomas Ostensen & Tom Carmichael What you'll need:- Slack channel: #t22-mon-ml-models (visit <https://softwareunderground.org/slack> to join...

Discipline

Geosciences

Language

English

Geoscientific Model Development - Wikiped...

Geoscientific Model Development is a peer-reviewed open access scientific journal publis...

The journal Geoscientific Model Development (GMD) is a peer-reviewed open-access scientific journal published by Copernicus Publications on behalf of the European Geosciences Union. It focuses on the description, development, and evaluation of numerical models of the Earth system and its components.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ziming Ke / Desert Research Institute

Authors Imported from DOI:

Title: Assessing the Impact of Burn Severity on Vegetation: A Time Series Analysis of the Meadow Valley & South Sugar Loaf Wildfire

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Assessing the Impact of Burn Severity on Vegetation: A Time Series Analysis of the Meadow Valley & South Sugar Loaf Wildfire

Abstract:

Forum Name: World Environmental and Water Resources Congress 2025

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

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Ibtihaj Ahmad / University of Nevada-Las Vegas

Sajjad Ahmad / University of Nevada-Las Vegas

Haroon Sahotra / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Automatic Labeling of Real-World PMU Data: A Weakly Supervised Learning Approach

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-11-28

Peer Reviewed: Yes

URL:

Title: Automatic Labeling of Real-World PMU Data: A Weakly Supervised Learning Approach

Abstract:

Forum Name: Electronics

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Lei Yang / University of Nevada-Reno

Authors Imported from DOI:

Title: Bringing Fire Science to the High School Classroom

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: Yes

URL:

Title: Bringing Fire Science to the High School Classroom

Abstract:

Forum Name: National Science Teaching Association (NSTA)

Details:

Spring 2025 presentation.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Merryn Cole / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Brown Carbon Optical Variability in U.S. Urban Aerosols Revealed by an Enhanced Spectral/Mass Balance Approach

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-12-05

Peer Reviewed: Yes

URL: <https://pubs.acs.org/doi/10.1021/acs.estlett.5c01077>

Title: Brown Carbon Optical Variability in U.S. Urban Aerosols Revealed by an Enhanced Spectral/Mass Balance Approach

Abstract:

Light absorption by brown carbon (BrC) represents a major uncertainty in assessing the climatic effects of carbonaceous aerosols. Using 38,622 PM_{2.5} samples collected from the U.S. Chemical Speciation Network (2016–2018) and analyzed by a multiwavelength thermal/optical analyzer (TOA), we applied an enhanced spectral/mass balance receptor model to quantify black carbon (BC), BrC, and nonabsorbing white carbon (WtC) while allowing BrC optical properties to vary across samples. The model achieved excellent fits ($r^2 > 0.98$) and revealed a wide range of BrC absorption Ångström exponent ($AAE_{405-635 \text{ nm}} = 2.13 \pm 0.74$) and mass absorption efficiency ($MAE_{532 \text{ nm}} = 2.03 \pm 0.35 \text{ m}^2 \text{ g}^{-1}$). An inverse AAE–MAE relationship was found, with strongly to moderately absorbing BrC being the most prevalent BrC classes. Seasonal patterns showed higher “organic brownness” (i. e., higher BrC mass fraction in organic carbon regardless of BrC class) but lower MAE in winter and the opposite in summer, reflecting the bleaching evolution of BrC with photochemical aging. BrC abundance also influenced the reconciliation between BC- and TOA-derived elemental carbon, likely through altered thermal–optical carbon analysis splits. This study provides the first nationwide characterization of BrC optical variability from national network data, establishing a scalable framework toward long-term monitoring of organic aerosol absorption within existing regulatory programs.

Forum Name: Environmental Science & Technology Letters

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: Chenetal2026ES&TLettCSNBrownCarbon.pdf

Contributors:

Lung-Wen Chen / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Bytes & Brews NSF EPSCoR HDRFS Data Analytics Networking Opportunity University of Nevada, Reno April 24th, 2025

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event PPT Presentation

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Bytes & Brews NSF EPSCoR HDRFS Data Analytics Networking Opportunity University of Nevada, Reno April 24th, 2025

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: DA_NetworkingEvent_presentation_IV25.pdf

Contributors:

Kyle Brice / Estipona Group

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Francesco Zuniga / NV Energy

Authors Imported from DOI:

Title: Can Score-Based Generative Modeling Effectively Handle Medical Image Classification?

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-05-12

Peer Reviewed: Yes

URL:

Title: Can Score-Based Generative Modeling Effectively Handle Medical Image Classification?

Abstract:

Forum Name: ISBI

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

SUSHMITA SARKER / University of Nevada-Reno

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Authors Imported from DOI:

Title: Characterization of Emissions from Burned Residue in Post-Wildfire Residential Zones: Analytical approaches for assessing the impact of wildland-urban interface (WUI) fires

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Characterization of Emissions from Burned Residue in Post-Wildfire Residential Zones: Analytical approaches for assessing the impact of wildland-urban interface (WUI) fires

Abstract:

Forum Name: 2025 Annual Meeting of AAAR

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Andrey Khlystov / Desert Research Institute

Vera Samburova / Desert Research Institute

Authors Imported from DOI:

Title: Charcoal analysis for temperature reconstruction with infrared spectroscopy

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-02-16

Peer Reviewed: Yes

URL: <https://doi.org/10.3389/feart.2024.1354080>

Title: Charcoal analysis for temperature reconstruction with infrared spectroscopy

Abstract:

The duration and maximum combustion temperature of vegetation fires are important fire properties with implications for ecology, hydrology, hazard potential, and many other processes. Directly measuring maximum combustion temperature during vegetation fires is difficult. However, chemical transformations associated with temperature are reflected in the chemical properties of charcoals (a by-product of fire). Therefore, charcoal could be used indirectly to determine the maximum combustion temperature of vegetation fires with application to palaeoecological charcoal records. To evaluate the reliability of charcoal chemistry as an indicator of maximum combustion temperature, we studied the chemical properties of charcoal formed through two laboratory methods at measured temperatures. Using a muffle furnace, we generated charcoal from the woody material of ten different tree and shrub species at seven distinct peak temperatures (from 200°C to 800°C in 100°C increments). Additionally, we simulated more natural combustion conditions by burning woody material and leaves of four tree species in a combustion facility instrumented with thermocouples, including thermocouples inside and outside of tree branches. Charcoal samples generated in these controlled settings were analyzed using Fourier Transform Infrared (FTIR) spectroscopy to characterize their chemical properties. The Modern Analogue Technique (MAT) was employed on FTIR spectra of muffle furnace charcoal to assess the accuracy of inferring maximum pyrolysis temperature. The MAT model temperature matching accuracy improved from 46% for all analogues to 81% when including $\pm 100^\circ\text{C}$. Furthermore, we used MAT to compare charcoal created in the combustion facility with muffle furnace charcoal. Our findings indicate that the spectra of charcoals generated in a combustion facility can be accurately matched with muffle furnace-created charcoals of similar temperatures using MAT, and the accuracy improved when comparing the maximum pyrolysis temperature from muffle furnace charcoal with the maximum inner temperature of the combustion facility charcoal. This suggests that charcoal produced in a muffle furnace may be representative of the inner maximum temperatures for vegetation fire-produced charcoals.

DOI: 10.3389/feart.2024.1354080

Forum Name: Frontiers in Earth Science

Details:

Publisher: Frontiers Media SA

Volume: 12

Issue:

Page:

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Federal Support Acknowledged:

Attached Document:

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Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

S. Yoshi Maezumi

Title: Chemical Aging of Emissions in Sagebrush Fire Scenarios

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL:

Title: Chemical Aging of Emissions in Sagebrush Fire Scenarios

Abstract:

Forum Name: 2026 AMS Annual Meeting

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

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William Stockwell / Desert Research Institute

Azimeh Zare Harofteh / Desert Research Institute

Authors Imported from DOI:

Title: Chemical Speciation Network Reveals Variations of Brown Carbon Concentration and Optical Property Across the United States

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: Yes

URL: [https://awmaace24.eventscribe.net/fsPopup.asp?](https://awmaace24.eventscribe.net/fsPopup.asp?PresentationID=1423763&mode=presInfo)

PresentationID=1423763&mode=presInfo

Title: Chemical Speciation Network Reveals Variations of Brown Carbon Concentration and Optical Property Across the United States

Abstract:

Forum Name: A&WMA 117th Annual Conference & Exhibition

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Lung-Wen Chen / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Chemical speciation of biomass burning emissions from shrubland vegetation

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Chemical speciation of biomass burning emissions from shrubland vegetation

Abstract:

Forum Name: 2024 Annual Meeting of AAAR

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

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Andrey Khlystov / Desert Research Institute

Bianca Martinez / Desert Research Institute

Authors Imported from DOI:

Title: Chemical Speciation of Flaming and Smoldering Combustion from Sagebrush Ecosystem Vegetation

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Chemical Speciation of Flaming and Smoldering Combustion from Sagebrush Ecosystem Vegetation

Abstract:

Forum Name: 2025 Annual Meeting of AAAR

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Chiranjivi Bhattarai / Desert Research Institute

Andrey Khlystov / Desert Research Institute

Bianca Martinez / Desert Research Institute

Authors Imported from DOI:

Title: Comment on “Could We Achieve the On#Line Measurements of the Optical Fractal Dimensions of Black Carbon?” by G. Zhao, M. Hu, W. Lin, Y. Kuang, J. Sun,L. Zeng, and C. Zhao

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-06-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1029/2025gl116124>

Title: Comment on “Could We Achieve the On#Line Measurements of the Optical Fractal Dimensions of Black Carbon?” by G. Zhao, M. Hu, W. Lin, Y. Kuang, J. Sun,L. Zeng, and C. Zhao

Abstract:

Zhao et al. (2025, <https://doi.org/10.1029/2024GL112332>) state the need for measuring the fractal dimension of black carbon aggregates online and proceed to propose and demonstrate a novel method to derive this fractal dimension from measured mobility parameters and mass concentrations. Their summary of the previous state#of#the#art is that the fractal dimension could not be measured online. Here, we briefly review the literature on the current state#of#the#art for light scattering experiments and clearly establish that optical laboratory measurements of aggregate fractal dimension and size have been performed. Furthermore, we agree with Zhao et al. (2025, <https://doi.org/10.1029/2024GL112332>) on the importance of developing and utilizing online instruments for such measurements and argue that optical scattering measurements can do so at low cost.

DOI: 10.1029/2025gl116124

Forum Name: Geophysical Research Letters

Details:

Publisher: American Geophysical Union (AGU)

Volume: 52

Issue: 11

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RII Support: Partial

Federal Support Acknowledged:

Attached Document:

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Justin B. Maughan / Pratt Community College Pratt KS USA

Christopher M. Sorensen / Department of Physics Kansas State University Manhattan KS USA

Title: Connecting in the wild: building collaborative field data networks for Team Science

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Connecting in the wild: building collaborative field data networks for Team Science

Abstract:

Modern earth and environmental science projects increasingly rely on remote in-situ sensor technologies for observation and data collection. At the same time, many of the locations where these sensors need to be placed do not have readily-available data networks for connectivity and remote management. Nevada is operating a leading network backbone for science sensor deployments across the region, and this presentation discusses the evolution of wireless sensor networks, best practices, and how these technologies are needed for all scales of modern Team Science.

Forum Name: Internet2 Technical Exchange (TechEx)

Details:

TechEX25, held Dec. 8-12 at the Sheraton Denver Downtown, Denver, Colo., is more than the premier technical event in the global research and education (R&E) community. It is a community-centric program designed for the cross-pollination of ideas.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: 2025-I2TechEx-Wireless-small.pdf

Contributors:

Scotty Strachan / Nevada System of Higher Education

Authors Imported from DOI:

Title: Core IAM Technology for Supporting Distributed Team Science

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Core IAM Technology for Supporting Distributed Team Science

Abstract:

Researchers increasingly depend on complex digital ecosystems, yet are still expected to build and manage them themselves. This has driven the rise of Research Computing & Data (RCD) professionals—experts who bridge science and technology. Research communities need core IT services like dedicated networks and Identity and Access Management (IAM), not just advanced tools, to get started effectively. A Nevada case study highlights decades of technical debt in higher-education IT, where systems are optimized for enterprise support rather than research agility. Small teams, high staff turnover, and limited expertise often leave scientists building insecure or unsustainable solutions. There is a clear need for simplified, federated-first architectures, clear documentation, and self-service models that survive staffing changes.

Forum Name: 21st FIM4R Workshop: Internet2 Technical Exchange Conference

Details:

On December 7, 45 participants from the global research identity and infrastructure community met for FIM4R's 21st workshop co-located with Internet2's TechEX conference in Denver to discuss how identity, access management, and Research IT can better support modern research collaborations. Full notes are available as PDF: Notes FIM4R 21st Workshop Denver 2025 as well as the presentations via our agenda: <https://indico.cern.ch/event/1590897/>

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: 2025-I2TechEx-IAM.pdf

Contributors:

Garrett Blain-Castelli / Nevada System of Higher Education

Scotty Strachan / Nevada System of Higher Education

Authors Imported from DOI:

Title: Crop Water Productivity: Within-Field Spatial Variation in Irrigated Alfalfa (*Medicago sativa* L.)

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-04-10

Peer Reviewed: Yes

URL: <https://www.mdpi.com/2624-7402/7/4/115>

Title: Crop Water Productivity: Within-Field Spatial Variation in Irrigated Alfalfa (*Medicago sativa* L.)

Abstract:

In this study, alfalfa (*Medicago sativa* L.) is evaluated for suitability of variable rate irrigation (VRI) by analyzing within-field variation in crop water productivity (CWP) under uniform irrigation. The objectives were to (1) measure within-field variation in crop evapotranspiration (ET), (2) quantify spatial variability of alfalfa biomass yield, and (3) assess whether a bivariate analysis of CWP and yield could inform VRI management zones. Research was conducted on a 22.6 ha center-pivot irrigated alfalfa field near Rexburg, Idaho, USA, over three harvest intervals (HIs) in 2021 and 2022. Using a water balance method at 66 field points, ET exhibited significant spatial clustering for each HI ($p < 0.001$ for all HIs), though spatial patterns varied among HIs. Biomass yield, measured via the quadrat method, ranged from 2.1 to 9.7 Mg ha⁻¹, with significant spatial clustering ($p < 0.001$ for all HIs). The CWP ranged from 0.07 to 0.54 Mg ha⁻¹ cm⁻¹, also showing significant spatial clustering ($p < 0.001$ for all HIs). Bivariate cluster analysis indicated 12–18% more area of the field was over-watered than under-watered, suggesting potential for optimizing irrigation with VRI. Reducing irrigation in these over-watered zones could improve CWP, supporting alfalfa as a viable candidate for VRI.

Forum Name: AgriEngineering

Details:

MDPI Open Access journal

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Keegan Hammond / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Curriculum - Final Draft of HS Wildfire Ecology curriculum. Used in classrooms by pre-service teachers and engineering interns through UNR and UNLC outreach programs during the 24-25 school year. Will become available for public use on Green Box website in May 2025.

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Curriculum - Final Draft of HS Wildfire Ecology curriculum. Used in classrooms by pre-service teachers and engineering interns through UNR and UNLC outreach programs during the 24-25 school year. Will become available for public use on Green Box website in May 2025.

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

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Ileah Kirchoff / Desert Research Institute

Authors Imported from DOI:

Title: Curriculum - Final Draft of MS Chemistry of Fire Emissions curriculum. Used in classrooms by pre-service teachers and engineering interns through UNR and UNLC outreach programs during the 25-26 school year. Will become available for public use on Green Box website in May 2026.

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Curriculum - Final Draft of MS Chemistry of Fire Emissions curriculum. Used in classrooms by pre-service teachers and engineering interns through UNR and UNLC outreach programs during the 25-26 school year. Will become available for public use on Green Box website in May 2026.

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Ileah Kirchoff / Desert Research Institute

Authors Imported from DOI:

Title: Curriculum - Final Draft of MS Wildfire Ecology curriculum. Used in classrooms by pre-service teachers through UNR and UNLV outreach programs during the 23-24 school year. Will become available for public use on Green Box website in May 2024.

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Curriculum - Final Draft of MS Wildfire Ecology curriculum. Used in classrooms by pre-service teachers through UNR and UNLV outreach programs during the 23-24 school year. Will become available for public use on Green Box website in May 2024.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ileah Kirchoff / Desert Research Institute

Authors Imported from DOI:

Title: Curriculum - First draft of HS Atomic Structure of Wildfire Smoke curriculum. Will be used in classrooms by pre-service teachers through UNR and UNLV outreach programs during the 26-27 school year. Will become available for public use on the Green Box website in May 2027.

Report: 2026/2148788

Product Type: Curriculum

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Curriculum - First draft of HS Atomic Structure of Wildfire Smoke curriculum. Will be used in classrooms by pre-service teachers through UNR and UNLV outreach programs during the 26-27 school year. Will become available for public use on the Green Box website in May 2027.

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ileah Kirchoff / Desert Research Institute

Authors Imported from DOI:

Title: Curriculum - First draft of HS Wildfire Ecology curriculum. Will be used in classrooms by pre-service teachers through UNR and UNLV outreach programs during the 24-25 school year. Will become available for public use on the Green Box website in May 2025.

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Curriculum - First draft of HS Wildfire Ecology curriculum. Will be used in classrooms by pre-service teachers through UNR and UNLV outreach programs during the 24-25 school year. Will become available for public use on the Green Box website in May 2025.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ileah Kirchoff / Desert Research Institute

Authors Imported from DOI:

Title: Darwin's Dust and the Search for Signs of Ancient Life on Mars

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Darwin's Dust and the Search for Signs of Ancient Life on Mars

Abstract:

Forum Name: DUST Seminar Series (Session One: Dust - The Basics) of the Clean Air Society of Australia & New Zealand

Details:

online

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: Moosmuller_CASANZ_2025_compressed.pdf

Contributors:

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Title: Data Analytics Certification Program - In class Presentation

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL: [https://nshenevada.sharepoint.com/:p:/r/sites/nshe_hdrfs/_layouts/15/Doc.aspx?sourcedoc=%7BBAE6C7A4-B34C-49FE-98B8-CA3A808F7784%7D&file=Data%20Analytics%20Training%20-%202025%20Recruitment%20slides%20for%20STUDENTS\(1\).pptx&action=edit&mobileredirect=true](https://nshenevada.sharepoint.com/:p:/r/sites/nshe_hdrfs/_layouts/15/Doc.aspx?sourcedoc=%7BBAE6C7A4-B34C-49FE-98B8-CA3A808F7784%7D&file=Data%20Analytics%20Training%20-%202025%20Recruitment%20slides%20for%20STUDENTS(1).pptx&action=edit&mobileredirect=true)

Title: Data Analytics Certification Program - In class Presentation

Abstract:

Presentation that is presented to students in class discussing the certification training program.

Forum Name: In Class Presentation

Details:

Presentation that is presented to students in class discussing the certification training program.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Data Analytics Training Cert Program Flyer

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL: https://nshenevada.sharepoint.com/sites/nshe_hdrfs/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2Fnshe%5Fhdrfs%2FShared%20Documents%2FComponents%2FEducation%20and%20Workforce%20Development%2FPathway%202%2FDA%20Cert%20Program%202025%2FProducts%2FDA%5FTraining%5FFlyer%5F2025%5F02%5F12%2Epng&viewid=f41ab46f%2Df78f%2D4467%2D9235%2Db57041a60e64&parent=%2Fsites%2Fnshe%5Fhdrfs%2FShared%20Documents%2FComponents%2FEducation%20and%20Workforce%20Development%2FPathway%202%2FDA%20Cert%20Program%202025%2FProducts

Title: Data Analytics Training Cert Program Flyer

Abstract:

Flyer posted throughout the institutions to get the word out to students regarding this opportunity to learn data analytical skills.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Data Literacy Power BI Installation workshop 07/24/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Data Literacy Power BI Installation workshop 07/24/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 3_Data_Literacy25_PowerBI_Installation_Workshop.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Data Literacy workshop 0 06/05/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Data Literacy workshop 0 06/05/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 0_Data_Literacy25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Data Literacy workshop 1 06/23/2025

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Data Literacy workshop 1 06/23/2025

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 1_Data_Literacy25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Data Literacy workshop 2 07/10/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Data Literacy workshop 2 07/10/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 2_Data_Literacy.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Data Literacy workshop 3 07/24/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Data Literacy workshop 3 07/24/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 3_Data_Literacy25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Detecting backdoor attacks in federated learning via direction alignment inspection

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Detecting backdoor attacks in federated learning via direction alignment inspection

Abstract:

The distributed nature of training makes Federated Learning (FL) vulnerable to backdoor attacks, where malicious model updates aim to compromise the global model's performance on specific tasks. Existing defense methods show limited efficacy as they overlook the inconsistency between benign and malicious model updates regarding both general and fine-grained directions. To fill this gap, we introduce AlignIns, a novel defense method designed to safeguard FL systems against backdoor attacks. AlignIns looks into the direction of each model update through a direction alignment inspection process. Specifically, it examines the alignment of model updates with the overall update direction and analyzes the distribution of the signs of their significant parameters, comparing them with the principle sign across all model updates. Model updates that exhibit an unusual degree of alignment are considered malicious and thus be filtered out. We provide the theoretical analysis of the robustness of AlignIns and its propagation error in FL. Our empirical results on both independent and identically distributed (IID) and non-IID datasets demonstrate that AlignIns achieves higher robustness compared to the state-of-the-art defense methods. The code is available at <https://github.com/JiiahaoXU/AlignIns>.

Forum Name: 2025 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV),

Details:

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Zikai Zhang / University of Nevada-Reno

Authors Imported from DOI:

Title: Detecting Backdoor Attacks in Federated Learning via Direction Alignment Inspection

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-06-10

Peer Reviewed: No

URL: <https://doi.org/10.1109/cvpr52734.2025.01923>

Title: Detecting Backdoor Attacks in Federated Learning via Direction Alignment Inspection

DOI: 10.1109/cvpr52734.2025.01923

Forum Name: 2025 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)

Details:

Publisher: IEEE

Event: 2025 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)

Page: 20654-20664

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Rui Hu / University of Nevada-Reno

Zikai Zhang / University of Nevada-Reno

Authors Imported from DOI:

Title: Determination of Aerosol Complex Refractive Index Spectra: Challenges and Opportunities

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Determination of Aerosol Complex Refractive Index Spectra: Challenges and Opportunities

Abstract:

Forum Name: Stakeholder Workshop on Aerosol Metrology, hosted by the Aerosol Task Group of the CCQM Gas Analysis Working Group (GAWG) of the International Bureau of Weights and Measures (BIPM)

Details:

online

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: Moosmuller_final.pdf

Contributors:

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Title: Developing Student Resources to Supplement NevadaTeach Fire Science Internship, by Grace Frazee, Brendon Trimble, and Ava DiMaggio, supported by Nick Nemsgern. Presented at UTeach Conference, May 2025, Reno, NV.

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Developing Student Resources to Supplement NevadaTeach Fire Science Internship, by Grace Frazee, Brendon Trimble, and Ava DiMaggio, supported by Nick Nemsgern. Presented at UTeach Conference, May 2025, Reno, NV.

Abstract:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ava DiMaggio / University of Nevada-Reno

Grace Frazee / University of Nevada-Reno

Nicholas Nemsgern / University of Nevada-Reno

Brendon Trimble / University of Nevada-Reno

Authors Imported from DOI:

Title: Dipole-like scattering by Rayleigh-sized particles with medium-matched real and general imaginary part of the refractive index

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-04-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.optcom.2025.131515>

Title: Dipole-like scattering by Rayleigh-sized particles with medium-matched real and general imaginary part of the refractive index

DOI: 10.1016/j.optcom.2025.131515

Forum Name: Optics Communications

Details:

Publisher: Elsevier BV

Volume: 578

Issue:

Page: 131515

ISSN: 0030-4018

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Prakash Gautam / Desert Research Institute

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Kurt Ehlers

Sami Labidi

Justin B. Maughan

Christopher M. Sorensen

Title: Distributed Sensor Networks for Decision Support in Lake Tahoe

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL:

Title: Distributed Sensor Networks for Decision Support in Lake Tahoe

Abstract:

Resource managers in the Lake Tahoe region require accurate and reliable data to make sustainable decisions. Recent seasonal volatility in this popular vacation destination has brought calls to better understand natural hazards pertaining to snow, drought, and fire. Rapid growth in outdoor recreation coupled with large spatiotemporal fluctuations in visitation often leave land managers, business owners, and community organizations at odds with policies that benefit all user groups. Current data sources do not offer the flexibility to explore ecohydrologic science questions across sub-watersheds in Tahoe, nor study the flux of recreationalists and the patterns they follow. Modern technology creates opportunities to improve quality, accuracy, and timely delivery of data products for environmental and transportation geographic sciences. Particularly, low-cost sensor systems connected by real-time data networks (e.g., the Internet of Things - IoT) is rapidly changing the research and management landscape. In the Intermountain West, the adoption of IoT so far has been grassroots and piecemeal. Our work is focused on development of science-ready IoT solutions, standardizing deployment models and associated data workflows to serve decision makers in water, fire, snow, recreation, and conservation communities. Initially, we are testing sensor deployments that use Long Range Wide-Area Network (LoRaWAN) edge communications technology, Starlink internet terminals, terrestrial wireless research network backhaul, and refined solar power designs. Our early results show that low-cost (<\$100) soil and air sensors can be deployed in the Lake Tahoe region with minimal disturbance and reliable network communications to hub sites across mountain terrain separated by many kilometers.

Forum Name: MtnClim 2024

Details:

Mountain Climate Conference 2024, Lake Tahoe, California

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Jehren Boehm / University of Nevada-Reno

Frederick Harris / Nevada System of Higher Education

Scotty Strachan / Nevada System of Higher Education

Authors Imported from DOI:

Title: DI-SULFUR TRIAZOLE PHOSPHATE FIRE RETARDANTS

Report: 2026/2148788

Product Type: Other

Other Type Description: Patent application

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: DI-SULFUR TRIAZOLE PHOSPHATE FIRE RETARDANTS

Abstract:

Described herein are di-sulfur triazole phosphate or thiophosphate compounds, methods for the synthesis thereof, and method for using the compounds as fire suppressants.

RII Support: Partial

Federal Support Acknowledged:

Attached Document: Patent app - Kang_WO2025111312A1.pdf

Contributors:

Jeffrey Ash / University of Nevada-Las Vegas

Parsa Azaei / University of Nevada-Las Vegas

Jun Yong Kang / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Di- Sulfur Triazole Phosphate Fire Retardants (United States Patent Application No. 63/601,377)

Report: 2026/2148788

Product Type: Patent

Status: Pending

Patent Application Number: 63/601,377

Awarded Date:

Patent Number:

Licensee:

Peer Reviewed: No

URL:

Title: Di- Sulfur Triazole Phosphate Fire Retardants (United States Patent Application No. 63/601,377)

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Jeffrey Ash / University of Nevada-Las Vegas

Parsa Azaei / University of Nevada-Las Vegas

Jun Yong Kang / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Dust in the Wind: Entrained Mineral Dust, Life, and the Universe

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Dust in the Wind: Entrained Mineral Dust, Life, and the Universe

Abstract:

Mineral dust dominates aerosol mass loadings in the atmosphere of Earth and is important for radiative forcing and climate change, human and machine visibility, fertilization of ecosystems, and transport of microorganisms. Some of this importance extends to Moon, Mars, and beyond. Yet, we know very little about optical and other properties of mineral dust, its entrainment, transport, and deposition, and its role in earth and other systems. I will summarize some of this knowledge and, more importantly, discuss future research needs.

Forum Name: European Aerosol Conference 2025 (EAC 2025)

Details:

invited plenary talk

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: Moosmuller_EAC_2025.pdf

Contributors:

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Title: Early-Stage Wildfire Detection: A Weakly Supervised Transformer-Based Approach

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-10-25

Peer Reviewed: Yes

URL:

Title: Early-Stage Wildfire Detection: A Weakly Supervised Transformer-Based Approach

Abstract:

Forum Name: Fire

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Lei Yang / University of Nevada-Reno

Authors Imported from DOI:

Title: Earth, Air, Water, and Fire: When the Classical Elements Get Complicated

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Earth, Air, Water, and Fire: When the Classical Elements Get Complicated

Abstract:

Many of the common assumptions about wildfire (that it increases soil hydrophobicity, reduces transpiration losses, reduces snowpack, etc.) are only true under certain circumstances. We present examples of post-fire soils and hydrology observations which challenge expected behavior. The focus is on over 10 years of field data collected in Illilouette Creek Basin, within California's Yosemite National Park (USA). This watershed has served as a natural experiment for the past half-century, where lightning-ignited wildfires have mostly been allowed to burn unsuppressed for the purposes of restoring a sustainable ecosystem and fire regime. The frequent mixed severity fires in this watershed provide a valuable contrast to the large high severity megafires that are more commonly studied. Measurements of air temperature, soil moisture and temperature, streamflow, and snowpack demonstrate how fire has affected the watershed in variable ways. Post-fire microclimates and related hydrologic changes can be greatly impacted by time since fire, number of burns, weather, and dominant vegetation type. Measurements across a broader area of Yosemite show that soil hydrophobicity is not necessarily highest in recently burned areas, with important implications for landslides and the water balance. These data are valuable but still represent only a small fraction of fire-affected landscapes in the world. The existing literature on post-fire hydrology mainly covers high severity fires in the Western United States, leaving many geographic regions and fire types under-studied. In addition, most of these studies cover fewer than five years post-fire. We discuss the importance of long-term case studies like the Illilouette Creek Basin while considering such findings in the global context when attempting to understand patterns in the complex behavior of fire, soils, and water.

Forum Name: American Geophysical Union Fall Meeting

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: AGU_2025_Boisrame.pdf

Contributors:

Markus Berli / Desert Research Institute

Gabrielle Boisrame / Desert Research Institute

Authors Imported from DOI:

Title: Effect of Vegetation Structure on Evapotranspiration and the Prediction of Evapotranspiration

Report: 2026/2148788

Product Type: Other

Other Type Description: Dissertation Defense

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Effect of Vegetation Structure on Evapotranspiration and the Prediction of Evapotranspiration

Abstract:

Understanding how vegetation structure controls evapotranspiration is important for predicting how changing climate conditions may influence hydrologic balances in different ecosystems. However, evaluating this topic across diverse ecosystems is often made difficult by the observational challenges associated with great spatiotemporal variability. The work in this dissertation utilizes unique network-and manually-collected ground-based field datasets and remotely sensed data at different spatial and temporal scales to evaluate how varying vegetation structures interact with components of evapotranspiration (ET). The components of ET studied here include canopy rainfall interception loss and storage across diverse forested ecosystems, and transpiration and soil evaporation in semi-arid shrublands.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Abigail Sandquist / University of Nevada-Reno

Authors Imported from DOI:

Title: Effects of Climate change, Fire Regimes and Invasion on Carbon Cycling in Sagebrush Ecosystems. Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology and Geochemistry. Andover, New Hampshire.

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Effects of Climate change, Fire Regimes and Invasion on Carbon Cycling in Sagebrush Ecosystems. Gordon Research Conference on Catchment Science: Interactions of Hydrology, Biology and Geochemistry. Andover, New Hampshire.

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

William Burke / University of Nevada-Reno

Erin Hanan / University of Nevada-Reno

Ayalkibet Mekonnen Seka / University of Nevada-Reno

Authors Imported from DOI:

Title: Emission factors for polycyclic aromatic hydrocarbons from laboratory biomass-burning and their chemical transformations during aging in an oxidation flow reactor

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2023-04-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.scitotenv.2023.161857>

Title: Emission factors for polycyclic aromatic hydrocarbons from laboratory biomass-burning and their chemical transformations during aging in an oxidation flow reactor

DOI: 10.1016/j.scitotenv.2023.161857

Forum Name: Science of The Total Environment

Details:

Publisher: Elsevier BV

Volume: 870

Issue:

Page: 161857

ISSN: 0048-9697

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Chiranjivi Bhattarai / Desert Research Institute

Andrey Khlystov / Desert Research Institute

Hans Moosmüller / Desert Research Institute

Vera Samburova / Desert Research Institute

Authors Imported from DOI:

Deep Sengupta

Title: employees.csv dataset

Report: 2026/2148788

Product Type: Dataset

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: employees.csv dataset

Abstract:

This is a sample data presented during the workshops to teach the students with some good practice together with the needed theory.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Enhancing efficient deep learning models with multimodal, multi-teacher insights for medical image segmentation

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-05-07

Peer Reviewed: Yes

URL:

Title: Enhancing efficient deep learning models with multimodal, multi-teacher insights for medical image segmentation

Abstract:

Forum Name: Scientific Reports

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Knondker Fariha Hossain / University of Nevada-Reno

Alireza Tavakkoli / University of Nevada-Reno

Authors Imported from DOI:

Title: Erased or Dormant? Rethinking Concept Erasure Through Reversibility

Report: 2026/2148788

Product Type: Posted Content

Published Status: Published

Published Date: 2025-05-22

Peer Reviewed: No

URL: <https://arxiv.org/abs/2505.16174>

Title: Erased or Dormant? Rethinking Concept Erasure Through Reversibility

Abstract:

To what extent does concept erasure eliminate generative capacity in diffusion models? While prior evaluations have primarily focused on measuring concept suppression under specific textual prompts, we explore a complementary and fundamental question: do current concept erasure techniques genuinely remove the ability to generate targeted concepts, or do they merely achieve superficial, prompt-specific suppression? We systematically evaluate the robustness and reversibility of two representative concept erasure methods, Unified Concept Editing and Erased Stable Diffusion, by probing their ability to eliminate targeted generative behaviors in text-to-image models. These methods attempt to suppress undesired semantic concepts by modifying internal model parameters, either through targeted attention edits or model-level fine-tuning strategies. To rigorously assess whether these techniques truly erase generative capacity, we propose an instance-level evaluation strategy that employs lightweight fine-tuning to explicitly test the reactivation potential of erased concepts. Through quantitative metrics and qualitative analyses, we show that erased concepts often reemerge with substantial visual fidelity after minimal adaptation, indicating that current methods suppress latent generative representations without fully eliminating them. Our findings reveal critical limitations in existing concept erasure approaches and highlight the need for deeper, representation-level interventions and more rigorous evaluation standards to ensure genuine, irreversible removal of concepts from generative models.

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Ping Liu / University of Nevada-Reno

Chi Zhang / National University of Singapore

Authors Imported from DOI:

Title: Excel Contact list

Report: 2026/2148788

Product Type: Dataset

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL: https://nshenevada.sharepoint.com/:x:/s/nshe_hdrfs/ER8u6LGF1RFDosbtmKjYYHQBblt8Mkk4TUssPZS9yskGKA?e=4%3A9JFyrS&at=9

Title: Excel Contact list

Abstract:

Data set of contacts for each institution within northern and southern Nevada.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Experimental and Computational Study of Pyrogenic Carbonaceous Matter Facilitated Hydrolysis of 2,4-Dinitroanisole (DNAN)

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-05-13

Peer Reviewed: Yes

URL: <https://doi.org/10.1021/acs.est.4c01069>

Title: Experimental and Computational Study of Pyrogenic Carbonaceous Matter Facilitated Hydrolysis of 2,4-Dinitroanisole (DNAN)

DOI: 10.1021/acs.est.4c01069

Forum Name: Environmental Science & Technology

Details:

Publisher: American Chemical Society (ACS)

Volume: 58

Issue: 21

Page: 9404-9415

ISSN: 0013-936X, 1520-5851

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Samuel A. Beal / U.S. Army ERDC-CRREL, Hanover, New Hampshire 03755-1290, United States

Eric J. Bylaska / Physical Science Division, Pacific Northwest National Laboratory, Richland, Washington 99352, United States

Joseph J. Pignatello / Department of Environmental Sciences, The Connecticut Agricultural Experiment Station, 123 Huntington St., New Haven, Connecticut 06511, United States

Paul G. Tratnyek / OHSU-PSU School of Public Health, Oregon Health & Science University, Portland, Oregon 97239, United States

Title: Experimental and Computational Study on Pyrogenic Carbonaceous Matter Facilitated Hydrolysis of 2,4-Dinitroanisole (DNAN)

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Experimental and Computational Study on Pyrogenic Carbonaceous Matter Facilitated Hydrolysis of 2,4-Dinitroanisole (DNAN)

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Title: Experimental and Computational Study on Pyrogenic Carbonaceous Matter Facilitated Hydrolysis of 2,4-Dinitroanisole (DNAN)

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Experimental and Computational Study on Pyrogenic Carbonaceous Matter Facilitated Hydrolysis of 2,4-Dinitroanisole (DNAN)

Abstract:

Forum Name: American Chemical Society (ACS) National Meeting, New Orleans, LA, March 2024

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Title: Fed-HeLLO: Efficient Federated Foundation Model Fine-Tuning With Heterogeneous LoRA Allocation

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-10-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1109/tnnls.2025.3580495>

Title: Fed-HeLLO: Efficient Federated Foundation Model Fine-Tuning With Heterogeneous LoRA Allocation

DOI: 10.1109/tnnls.2025.3580495

Forum Name: IEEE Transactions on Neural Networks and Learning Systems

Details:

Publisher: Institute of Electrical and Electronics Engineers (IEEE)

Volume: 36

Issue: 10

Page: 17556-17569

ISSN: 2162-237X, 2162-2388

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Rui Hu / University of Nevada-Reno

Ping Liu / University of Nevada-Reno

Zikai Zhang / University of Nevada-Reno

Authors Imported from DOI:

Title: Fire Ecology Green Boxes (self-contained teaching kits)

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL: <https://www.dri.edu/stem-education-program/green-boxes/>

Title: Fire Ecology Green Boxes (self-contained teaching kits)

Abstract:

For middle and high school students. These sets of kits were developed for the HDRFS education-workforce development to engage undergraduate pre-service or STEM Ambassadors in implementing education content throughout Nevada school districts. The curricula was informed by HDRFS research themes and faculty.

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Ileah Kirchoff / Desert Research Institute

Leah Madison / Desert Research Institute

Emily McDonald-Williams / Desert Research Institute

Authors Imported from DOI:

Title: Fire impacts on soil hydraulic properties in a sagebrush ecosystem in Nevada

Report: 2026/2148788

Product Type: Conference Proceedings

Published Status: Published

Published Date: 2025-04-29

Peer Reviewed: No

URL:

Title: Fire impacts on soil hydraulic properties in a sagebrush ecosystem in Nevada

Abstract:

Covering approximately one third of the US, sagebrush dominated ecosystems are an important part of the continental United States' landscape. The effects of wildfires on the hydrology of semi-arid, sagebrush ecosystems are poorly understood and, as these areas experience more frequent wildfires, become more relevant. A field experiment near Reno, Nevada, aims at a better understanding of fire impacts on the hydrology of a sagebrush ecosystem by measuring hydraulic properties of the soil before and after a prescribed burn. In spring of 2024, 20 experimental plots of 3x4 side length were instrumented for soil moisture and temperature monitoring. Over the same period, infiltration and water repellency under shrubs and between shrubs have been measured. In fall 2025, 10 of the 20 experimental plots will be burned, which will allow us to compare the hydraulic properties of the same soil before and after the fire, therefore directly assess fire impact on soil hydrologic properties. This presentation introduces the field experiment, provides a site characterization as well as the first year of pre-fire soil moisture, temperature, infiltration and water repellency data. It also addresses calibration of the Campbell HydroSense II (HSII) and TOMST TMS4 soil moisture probes used for the experiment and instrumental for accurately measuring soil moisture at the 20 experimental sites

Forum Name: European Geosciences Union (EGU)

Details:

EGU General Assembly

27 April–2 May

Vienna, Austria

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Markus Berli / Desert Research Institute

Gabrielle Boisrame / Desert Research Institute

Conor Croskery / Desert Research Institute

Nyamekye Joshua Okyere / Desert Research Institute

Authors Imported from DOI:

Title: Framework for Monitoring Post-fire Vegetation Dynamics: Insights from Carpenter-1 Wildfire

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Framework for Monitoring Post-fire Vegetation Dynamics: Insights from Carpenter-1 Wildfire

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: Framework for Monitoring Post-fire Vegetation Dynamics Insights from Carpenter-1 Wildfire.pdf

Contributors:

Ibtihaj Ahmad / University of Nevada-Las Vegas

Haroon Sahotra / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Guided and Unguided Conditional Diffusion Mechanisms for Structured and Semantically-Aware 3D Point Cloud Generation

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-12-01

Peer Reviewed: Yes

URL:

Title: Guided and Unguided Conditional Diffusion Mechanisms for Structured and Semantically-Aware 3D Point Cloud Generation

Abstract:

Forum Name: ICMLA

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

SUSHMITA SARKER / University of Nevada-Reno

Gunner Stone / University of Nevada-Reno

Alireza Tavakkoli / University of Nevada-Reno

Authors Imported from DOI:

Title: How many ODEs are required to describe multicomponent aerosol evaporation in vapor-free conditions?

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: How many ODEs are required to describe multicomponent aerosol evaporation in vapor-free conditions?

Abstract:

Forum Name: 2024 Annual Meeting of AAAR

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Andrey Khlystov / Desert Research Institute

Authors Imported from DOI:

Title: Human- elephant conflict: insights from vegetation analysis in Sri Lanka

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL:

Title: Human- elephant conflict: insights from vegetation analysis in Sri Lanka

Abstract:

Human elephant Conflict is not an Elephant Problem; it's a Human Problem. – Chandima Fernando In Sri Lanka, Human-Elephant Conflict (HEC) resulted in the death of 470 elephants and 145 humans, in 2023. 1,2. Agriculture directly encroaches on elephant habitat and elephants raid farmers' crops setting the stage for conflict. 1 This study examines Sri Lankan elephant (*Elephas maximus*) presence in agricultural and nonagricultural areas outside Wasgamuwa National Park. Dung is elephant feces and provides data for elephant presence and dietary context. Normalized Difference Vegetation Index (NDVI) compares vegetation densities and health among agricultural and nonagricultural areas.⁴ This research evaluated elephant presence in relation to NDVI, providing insights for alleviating the intensity of conflict by informing management strategies for existing agricultural fields and elephant habitat conservation

Forum Name: Wolf Pack Discoveries

Details:

UNR research symposium

RII Support: Partial

Federal Support Acknowledged:

Attached Document: Final_Poster_fr (2).pdf

Contributors:

William Richardson / Univeristy of Nevada, Reno

Authors Imported from DOI:

Title: Insights from Wildfire Research: Air quality, monitoring technologies, and post-fire soils

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Insights from Wildfire Research: Air quality, monitoring technologies, and post-fire soils

Abstract:

Forum Name: Great Basin Fire Science Exchange - Student Presentations and Panel Discussion

Details:

Tuesday 3 March 2026, 11:00-12:30 - Presented via Zoom

RII Support: Partial

Federal Support Acknowledged:

Attached Document: 2026-03-03_WildfireResearchWebinar_Flyer.pdf

Contributors:

Jehren Boehm / University of Nevada-Reno

Conor Croskery / Desert Research Institute

Bianca Martinez / Desert Research Institute

Authors Imported from DOI:

Title: Internal Evaluation Metrics Report 01/30/25

Report: 2026/2148788

Product Type: Report Series

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Internal Evaluation Metrics Report 01/30/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Internal_evaluation_metrics_report_13025_IV.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Internal Evaluation Metrics Report 05/31/2025

Report: 2026/2148788

Product Type: Report Series

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Internal Evaluation Metrics Report 05/31/2025

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Internal evaluation metrics report_53125_IV_.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Internal Evaluation Metrics Report 06/30/2025

Report: 2026/2148788

Product Type: Report Series

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Internal Evaluation Metrics Report 06/30/2025

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Internal evaluation metrics report_IV2025.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Internal Evaluation Metrics Report 12/15/24

Report: 2026/2148788

Product Type: Report Series

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Internal Evaluation Metrics Report 12/15/24

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Internal_evaluation_metrics_report_121524_IV.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Internal Evaluation Metrics Report 12/15/25

Report: 2026/2148788

Product Type: Report Series

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Internal Evaluation Metrics Report 12/15/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Internal_evaluation_metrics_report_IV122025.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Light-absorbing black carbon and brown carbon components of smoke aerosol from DSCOVr EPIC measurements over North America and central Africa

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-09-23

Peer Reviewed: Yes

URL: <https://doi.org/10.5194/acp-24-10543-2024>

Title: Light-absorbing black carbon and brown carbon components of smoke aerosol from DSCOVR EPIC measurements over North America and central Africa

Abstract:

Abstract. Wildfires and agricultural burning generate seemingly increasing smoke aerosol emissions, impacting societal and natural ecosystems. To understand smoke's effects on climate and public health, we analyzed the spatiotemporal distribution of smoke aerosols, focusing on two major light-absorbing components, namely black carbon (BC) and brown carbon (BrC) aerosols. Using NASA's Earth Polychromatic Imaging Camera (EPIC) instrument aboard NOAA's Deep Space Climate Observatory (DSCOVR) spacecraft, we inferred BC and BrC volume fractions and particle mass concentrations based on spectral absorption provided by the Multi-Angle Implementation of Atmospheric Correction (MAIAC) algorithm with 1–2 h temporal resolution and ≈ 10 km spatial resolution over North America and central Africa. Our analyses of regional smoke properties reveal distinct characteristics for aerosol optical depth (AOD) at 443 nm, spectral single-scattering albedo (SSA), aerosol layer height (ALH), and BC and BrC amounts. Smoke aerosols in North America showed extremely high AOD up to 6, with elevated ALH (6–7 km) and significant BrC components up to 250 mg m⁻² along the transport paths, whereas the smoke aerosols in central Africa exhibited stronger light absorption (i.e., lower SSA) and lower AOD, resulting in higher-BC mass concentrations and similar BrC mass concentrations than the cases in North America. Seasonal burning source locations in central Africa, following the seasonal shift in the Intertropical Convergence Zone and diurnal variations in smoke amounts, were also captured. A comparison of retrieved AOD₄₄₃, SSA₄₄₃, SSA₆₈₀, and ALH with collocated AERONET and CALIOP measurements shows agreement with RMSE values of 0.2, 0.03–0.04, 0.02–0.04, and 0.8–1.3 km, respectively. An analysis of the spatiotemporal average reveals distinct geographical characteristics in smoke properties closely linked to burning types and meteorological conditions. Forest wildfires over western North America generated smoke with a small-BC volume fraction of 0.011 and a high ALH with large variability (2.2 ± 1.2 km), whereas smoke from wildfires and agricultural burning over Mexico region shows more absorption and low ALH. Smoke from savanna fires over central Africa had the most absorption, with a high-BC volume fraction (0.015) and low ALH with a small variation (1.8 ± 0.6 km) among the analyzed regions. Tropical forest smoke was less absorbing and had a high variance in ALH. We also quantify the estimation uncertainties related to the assumptions of BC and BrC refractive indices. The MAIAC EPIC smoke properties with BC and BrC volume and mass fractions and assessment of the layer height provide observational constraints for radiative forcing modeling and air quality and health studies.

DOI: 10.5194/acp-24-10543-2024

Forum Name: Atmospheric Chemistry and Physics

Details:

Publisher: Copernicus GmbH

Volume: 24

Issue: 18

Page: 10543-10565

ISSN: 1680-7324

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Hans Moosmüller / Desert Research Institute

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Jeffrey S. Reid

Gregory L. Schuster

Title: Linking Fire Spread and Meteorology to Understand the Devastating Eaton Fire

Report: 2026/2148788

Product Type: Poster

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL: <https://ams.confex.com/ams/106ANNUAL/meetingapp.cgi/Paper/479068>

Title: Linking Fire Spread and Meteorology to Understand the Devastating Eaton Fire

Abstract:

On January 7, 2025, powerful Santa Ana winds ignited and then drove the devastating Eaton Fire. Igniting at the base of the San Gabriel mountains, the fire rapidly spread off the hillsides and into the suburb of Altadena, California. By the time it was extinguished on January 31, the fire had destroyed 9,418 structures and caused 19 fatalities. These catastrophic impacts occurred despite long-lead time forecasts for an unusually strong Santa Ana wind event, including early warnings for intense downslope winds in areas typically sheltered from common gap flows. Strong upper-level support created high-amplitude mountain waves and downslope winds beginning the evening of January 7, peaking with hurricane-force winds in the early morning of January 8. The goal of our study is twofold. First, we examine the observed and modeled winds using a combination of surface meteorological data (MESOWEST networks) and archived numerical weather prediction (GFS and HRRR). Our focus is on the locations of strong downslope winds, hydraulic jumps, and other critical features and how they evolved during the event. Second, we use satellite and radar observations to understand how the fire spread in these extreme mountain windstorm conditions. For example, despite the prevailing northeasterly flow, the fire exhibited substantial across-wind spread rather than the expected along-wind movement. We use radar data to reconstruct the fire's plume structure and satellite infrared observations to analyze the fire's temporal evolution. The outcome of this work will advance our understanding of the Eaton Fire's spread mechanisms, which is critical for improving future extreme wind-driven wildfire forecasts.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Neil Lareau / University of Nevada-Reno

Luke Zavala / University of Nevada-Reno

Authors Imported from DOI:

Title: Linking Pre-fire Fuel Characteristics with Observed Fire Intensity and Severity During the 2023 Practice Burns in an Arid Shrub Ecosystem

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL:

Title: Linking Pre-fire Fuel Characteristics with Observed Fire Intensity and Severity During the 2023 Practice Burns in an Arid Shrub Ecosystem

Abstract:

We conducted practice burns in two field plots that varied in pre-fire fuel composition to determine associations between pre-fire fuels and observed fire severity. At one plot with mostly shrub fuels, shrubs had larger volumes and a greater proportion of standing dead biomass, ignited readily, burned at high temperatures, and were almost entirely consumed by fire. At the other plot with mixed herbaceous and shrub fuels, shrubs had smaller volumes and a greater proportion of live biomass, but still ignited readily and were almost entirely burned. Herbaceous fuels burned but minimally. Shrub fuels were more flammable and burned at greater severity than herbaceous fuels. This suggests that future experimental burns may be particularly severe in plots dominated by shrubs, with implications for post-fire processes.

Forum Name: HDRFS Annual Meeting 2024

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Jay Arnone / Desert Research Institute

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Richard Jasoni / Desert Research Institute

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Authors Imported from DOI:

Title: Machine Learning-Based Land Cover Classification and Impact Assessment in Pre-wildfire and Post-wildfire Areas

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Machine Learning-Based Land Cover Classification and Impact Assessment in Pre-wildfire and Post-wildfire Areas

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: Machine Learning-Based Land Cover Classification and Impact Assessment in Pre-wildfire and Post-wildfire Areas.pdf

Contributors:

Ibtihaj Ahmad / University of Nevada-Las Vegas

Haroon Sahotra / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Metal-organic-framework and walnut shell biochar composites for lead and hexavalent chromium removal from aqueous environments

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-11-01

Peer Reviewed: No

URL:

Title: Metal-organic-framework and walnut shell biochar composites for lead and hexavalent chromium removal from aqueous environments

Abstract:

Extensive research in recent years has explored the realm of porous carbon composites for various applications, including electrochemistry, structural materials, environmental remediation, and more. In particular, the fabrication of porous carbon composites using a metal-organic framework (MOF) and biochar (BC) for aqueous remediation is a fairly new avenue of research. In this study, a MOF-BC composite was synthesized with unmodified and chemically modified BCs using solvothermal synthesis. The composites were used as adsorbents to remediate heavy metals, such as lead (II) and chromium (VI), from aqueous environments. It was verified that the MOF was homogeneously deposited onto the BC's surface using various material characterization techniques. Lead and chromium adsorption studies revealed a high adsorption capacity with greater than 99% removal for lead and #65% for chromium ...

Forum Name: Chemosphere

Details:

Journal

Chemosphere

Volume

367

Pages

143572

Publisher

Pergamon

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Emma Letourneau / University of Nevada-Las Vegas

Erica Marti / University of Nevada-Las Vegas

Jaeyun Moon / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Microclimate and environmental change decades following repeat wildfire and vegetation type conversion in a central Arizona ponderosa pine forest

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: Yes

URL:

Title: Microclimate and environmental change decades following repeat wildfire and vegetation type conversion in a central Arizona ponderosa pine forest

Abstract:

Wildfire is altering forested landscapes across the southwestern United States. There is opportunity to better understand regional landscape change by comparing more and less wildfire-affected forest areas at local scales. We evaluated meteorological and above- and belowground environmental variables in less-disturbed (PIPO: 2016 understory wildfire) and more-disturbed (PIPO-burned: 2000 stand-replacing, 2016 understory) ponderosa pine forest in central Arizona, USA. PIPO-burned experienced low conifer recovery and extensive woody plant type conversion following the 2000 wildfire. Using ground-based instrumentation and snow transect data, we found considerable abiotic differences between PIPO and PIPO-burned during a recent period (2022-2025 water years) with near-average air temperatures and precipitation, and one very low precipitation season (2025). These included significantly higher warm season (April-September) and cool season (October-March) solar radiation, wind speed, surface and soil temperature, and reference evapotranspiration. Although average snow depth was significantly higher at PIPO-burned, its snow often melted earlier in the spring. Near surface soil moisture (10, 20, 40 cm depth) at PIPO-burned was significantly lower than PIPO in both the warm and cool seasons. Indeed, we found that the density distributions of soil temperature and moisture were often dissimilar between PIPO and PIPO-burned. Underscoring the severity of these changes, we found that many meteorological and environmental variables at PIPOburned (2168 m) were on average more similar to those of a lower elevation piñon pine-juniper woodland (1605 m) than they were to the adjacent PIPO (2190 m). These local abiotic changes, here associated with repeat wildfire and woody plant type conversion over the past 25 years, illustrate the considerable transformation of forested landscapes in the southwestern US.

Forum Name: Agricultural and Forest Meteorology

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Keegan Hammond / University of Nevada-Las Vegas

Matthew Petrie / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Molecular spectroscopy on nuclear physics and high-energy physics.

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Molecular spectroscopy on nuclear physics and high-energy physics.

Abstract:

Forum Name: Fundamental Symmetry Workshop

Details:

CERN, Geneva Switzerland

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Yan Zhou / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Multi-ignition fire complexes drive extreme fire years and impacts

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2026-01-02

Peer Reviewed: Yes

URL: <https://www.science.org/doi/10.1126/sciadv.adx6477>

Title: Multi-ignition fire complexes drive extreme fire years and impacts

Abstract:

Climate change is intensifying fire behavior, with the largest and fastest-spreading fires causing the greatest impacts on people and ecosystems. Yet the mechanisms driving variability and trends in large fires remain poorly understood. Using 12-hour satellite-derived fire tracking data from 2012 to 2023, we show that the merging of separate ignitions into multi-ignition complexes is a key process amplifying fire size and destructive potential across temperate and boreal ecoregions. Multi-ignition fires account for 31% of the burned area in California and 59% in the Arctic-boreal domain, spread faster and persist longer than single-ignition fires, and disproportionately contribute to extreme fire years in California, Canada, and Siberia. They also generate stronger atmospheric feedbacks, produce more pyrocumulonimbus events, and strain firefighting capacity by dispersing suppression resources. Recognizing and accounting for fire-merging dynamics are critical for improving wildfire prediction, risk assessment, and management.

Forum Name: Science Advances

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ziming Ke / Desert Research Institute

Authors Imported from DOI:

Title: Nclab Presentation Networking event

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL: https://docs.google.com/presentation/d/1NyOck9IW78lsfJgsrI4Or8DbOBDOtEMp/edit?slide=id.g34f5dbae63d_0_44#slide=id.g34f5dbae63d_0_44

Title: Nclab Presentation Networking event

Abstract:

Antonio, partner of NClab, shared a presentation regarding the importance of data analytical skills.

Forum Name: Networking Event

Details:

Antonio, partner of NClab, shared a presentation regarding the importance of data analytical skills.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event Attendance sheet

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event Attendance sheet

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event Attendance sheet

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Networking Event Sign In.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event Brews and Bytes

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL: https://docs.google.com/presentation/d/1NyOck9IW78lsfJgsrI4Or8DbOBDOtEMp/edit?slide=id.g34f5dbae63d_0_44#slide=id.g34f5dbae63d_0_44

Title: Networking Event Brews and Bytes

Abstract:

Antonio Villalobos, partner of NClab, and I presented at the networking event for students to meet guests that work in the data analytical field.

Forum Name: Networking Event Brews and Bytes

Details:

Antonio Villalobos, partner of NClab, and I presented at the networking event for students to meet guests that work in the data analytical field.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event Brews and Bytes Presentation

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL: <https://docs.google.com/presentation/d/1z5HH16u3GxHafyaHzysqb2TrOoM3rfrP/edit?slide=id.p1#slide=id.p1>

Title: Networking Event Brews and Bytes Presentation

Abstract:

Presentation of guests within the data analytical field answering questions about their careers as well as allowing students time to ask questions and meet with guest.

Forum Name: Networking Event Brews and Bytes

Details:

Presentation of guests within the data analytical field answering questions about their careers as well as allowing students time to ask questions and meet with guest.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event Flyer

Report: 2026/2148788

Product Type: Poster

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL: [https://nshenevada.sharepoint.com/:p:/r/sites/nshe_hdrfs/_layouts/15/Doc.aspx?sourcedoc=%7BBAE6C7A4-B34C-49FE-98B8-CA3A808F7784%7D&file=Data%20Analytics%20Training%20-%202025%20Recruitment%20slides%20for%20STUDENTS\(1\).pptx&action=edit&mobileredirect=true](https://nshenevada.sharepoint.com/:p:/r/sites/nshe_hdrfs/_layouts/15/Doc.aspx?sourcedoc=%7BBAE6C7A4-B34C-49FE-98B8-CA3A808F7784%7D&file=Data%20Analytics%20Training%20-%202025%20Recruitment%20slides%20for%20STUDENTS(1).pptx&action=edit&mobileredirect=true)

Title: Networking Event Flyer

Abstract:

Flyer created to invite students to join networking event.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event - Panel Discussion - Questions

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event Panel Questions

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event - Panel Discussion - Questions

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Panel_Qs.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event - Pictures

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event - Pictures

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event - Pictures

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: IMG_1893.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event - Pictures 2

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event - Pictures

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event - Pictures 2

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: IMG_1855..pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event - Pictures 3

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event - Pictures

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event - Pictures 3

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: IMG_1843.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event - Pictures 4

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event - Pictures

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event - Pictures 4

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: IMG_1778.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event - Pictures 5

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event - Pictures

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event - Pictures 5

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: IMG_1766.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Networking Event Registration sheet

Report: 2026/2148788

Product Type: Other

Other Type Description: Networking Event Registration

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Networking Event Registration sheet

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: Event Registration (Responses).pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: NevadaNet Research & Education DMZ network and federated applications architecture

Report: 2026/2148788

Product Type: Technology/Technique

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: NevadaNet Research & Education DMZ network and federated applications architecture

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Scotty Strachan / Nevada System of Higher Education

Authors Imported from DOI:

Title: On evaporation kinetics of multicomponent aerosols: Characteristic times and implications for volatility measurements

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-08-08

Peer Reviewed: Yes

URL: <https://doi.org/10.1080/02786826.2024.2385640>

Title: On evaporation kinetics of multicomponent aerosols: Characteristic times and implications for volatility measurements

DOI: 10.1080/02786826.2024.2385640

Forum Name: Aerosol Science and Technology

Details:

Publisher: Informa UK Limited

Volume: 58

Issue: 10

Page: 1194-1205

ISSN: 0278-6826, 1521-7388

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Andrey Khlystov / Desert Research Institute

Authors Imported from DOI:

Title: On the Out-of-Distribution Backdoor Attack for Federated Learning

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-10-23

Peer Reviewed: No

URL: <https://doi.org/10.1145/3704413.3764465>

Title: On the Out-of-Distribution Backdoor Attack for Federated Learning

DOI: 10.1145/3704413.3764465

Forum Name: Proceedings of the Twenty-sixth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing

Details:

Publisher: ACM

Event: MobiHoc '25: Twenty-sixth International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing

Page: 181-190

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Rui Hu / University of Nevada-Reno

Zikai Zhang / University of Nevada-Reno

Authors Imported from DOI:

Title: Optimizing Pyrogenic Carbonaceous Matter (PCM) in Facilitating Hydrolysis and Adsorption of Insensitive Munition Compounds in Soils and Water Systems

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Optimizing Pyrogenic Carbonaceous Matter (PCM) in Facilitating Hydrolysis and Adsorption of Insensitive Munition Compounds in Soils and Water Systems

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Title: Participation of Strong H-Bonding to Acidic Groups Contributes to the Intense Sorption of the Anionic Munition, Nitrotriazolone (NTO) to the Carbon, Filtrasorb 400

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-11-06

Peer Reviewed: Yes

URL: <https://doi.org/10.1021/acs.est.4c07055>

Title: Participation of Strong H-Bonding to Acidic Groups Contributes to the Intense Sorption of the Anionic Munition, Nitrotriazolone (NTO) to the Carbon, Filtrasorb 400

DOI: 10.1021/acs.est.4c07055

Forum Name: Environmental Science & Technology

Details:

Publisher: American Chemical Society (ACS)

Volume: 58

Issue: 46

Page: 20719-20728

ISSN: 0013-936X, 1520-5851

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

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Authors Imported from DOI:

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Lingjun Meng / Department of Environmental Science and Forestry, The Connecticut Agricultural Experimental Station, New Haven, Connecticut 06511, United States

Joseph J. Pignatello / Department of Environmental Science and Forestry, The Connecticut Agricultural Experimental Station, New Haven, Connecticut 06511, United States

Title: Particle Size Distributions of Wildfire Aerosols in the Western USA

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-03-13

Peer Reviewed: Yes

URL: <https://pubs.rsc.org/en/content/articlelanding/2025/ea/d5ea00007f>

Title: Particle Size Distributions of Wildfire Aerosols in the Western USA

Abstract:

Forum Name: Environmental Science: Atmospheres

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Chiranjivi Bhattarai / Desert Research Institute

Andrey Khlystov / Desert Research Institute

Vera Samburova / Desert Research Institute

Authors Imported from DOI:

Title: Physical and Chemical Properties of Fire-Affected Soils from the Sagebrush Ecosystem of the Western US: A Laboratory Study

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-10-13

Peer Reviewed: Yes

URL: <https://doi.org/10.3390/soilsystems9040111>

Title: Physical and Chemical Properties of Fire-Affected Soils from the Sagebrush Ecosystem of the Western US: A Laboratory Study

Abstract:

This study aims to understand the effects of wildfires in sagebrush ecosystem on soil properties by examining connections between Soil Water Repellency (SWR), reflectance, and chemistry. Ash and burned soil samples were collected after performing laboratory burns of three common sagebrush plants: sagebrush, rabbitbrush, and bitterbrush. The collected samples were analyzed for their physical properties, including SWR measured by Water Drop Penetration Time (WDPT) and Apparent Contact Angle (ACA), and solar spectral reflectance in the wavelength range of 350 to 2500 nm. Chemical functional groups of the samples were analyzed using Fourier-Transform Infrared (FTIR) spectroscopy. WDPT and ACA values were in the range of 1 to 600 s and $\sim 10^\circ$ to 88° , respectively, for all three tested fuels. The FTIR analysis showed a decrease (~ 2 to 4 times) in the ratio of COO $\#$ /C=C signals for the burned soil samples compared to the unburned soil samples. Overall, increase in temperature and ACA levels for the samples of burned and burned soil from a 2 cm depth led to increased formation of non-polar compounds with C=C functional groups, and decarboxylation.

DOI: 10.3390/soilsystems9040111

Forum Name: Soil Systems

Details:

Publisher: MDPI AG

Volume: 9

Issue: 4

Page: 111

ISSN: 2571-8789

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

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Markus Berli / Desert Research Institute

William Curtiss / Desert Research Institute

Eden Furtak-Cole / Desert Research Institute

Andrey Khlystov / Desert Research Institute

Bianca Martinez / Desert Research Institute

Hans Moosmüller / Desert Research Institute

Yasaman Raeofy / Desert Research Institute

Vera Samburova / Desert Research Institute

Authors Imported from DOI:

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Brad Sion / Division of Earth and Ecosystem Sciences, Desert Research Institute, Reno, NV 89512, USA

Title: Plume Coupled Long Range Spotting Drove the Explosive Spread of the 2018 Camp Fire

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: Yes

URL:

Title: Plume Coupled Long Range Spotting Drove the Explosive Spread of the 2018 Camp Fire

Abstract:

Extreme fire spread during the 2018 Camp Fire in northern California was driven by organized long-range spotting tightly coupled to plume dynamics. Doppler radar and satellite observations reveal distinct regions of ember lofting and downwind fallout within the convective column, forming direct pathways for firebrand transport several (up to 10) kilometers ahead of the main fire front. These firebrands ignited dense clusters of new fires that merged into rapidly advancing lobes, producing abrupt surges in fire growth that exceeded expectations based on surface wind and fuel conditions alone.

Forum Name: Journal of Geophysical Research - Atmospheres

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: CAMP_FIRE_JGRA_FORMATTED2.pdf

Contributors:

Neil Lareau / University of Nevada-Reno

Authors Imported from DOI:

Title: Point-RTD: Replaced Token Denoising for Pretraining Transformer Models on Point Clouds

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-12-01

Peer Reviewed: Yes

URL:

Title: Point-RTD: Replaced Token Denoising for Pretraining Transformer Models on Point Clouds

Abstract:

Forum Name: ICMLA

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

SUSHMITA SARKER / University of Nevada-Reno

Gunner Stone / University of Nevada-Reno

Alireza Tavakkoli / University of Nevada-Reno

Authors Imported from DOI:

Title: Presentation Questions

Report: 2026/2148788

Product Type: Other

Other Type Description: Presentation Questions

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL: https://nshenevada.sharepoint.com/sites/nshe_hdrfs/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2Fnshe%5Fhdrfs%2FShared%20Documents%2FComponents%2FEducation%20and%20Workforce%20Development%2FPathway%202%2FDA%20Cert%20Program%202025%2FProducts%2FNetworking%20Event%20Questions%281%29%2Edocx&viewid=f41ab46f%2Df78f%2D4467%2D9235%2Db57041a60e64&parent=%2Fsites%2Fnshe%5Fhdrfs%2FShared%20Documents%2FComponents%2FEducation%20and%20Workforce%20Development%2FPathway%202%2FDA%20Cert%20Program%202025%2FProducts

Title: Presentation Questions

Abstract:

Questions asked at the networking event to guest discussing their personal experience in their career.

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Michele Casella / Nevada System of Higher Education

Meghan Collins / Desert Research Institute

Athena Lewis / Nevada System of Higher Education

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Product Type: Workshop Title: Data Literacy, Python, and SQL Workshops for the 2024 HDRFS Cohort

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Product Type: Workshop Title: Data Literacy, Python, and SQL Workshops for the 2024 HDRFS Cohort

Abstract:

As part of the 2024 HDRFS program, Ilaria Vinci, designed and led a series of workshops aimed at enhancing data literacy and technical proficiency in Python and SQL for participants at various skill levels. Building on the success of the 2023 workshops, Ilaria expanded the curriculum to cover additional key topics in each area, ensuring a comprehensive learning experience. The workshops focused on fundamental and advanced data analytics concepts, including data manipulation, visualization, and querying databases using SQL. The structured approach allowed for incremental learning, addressing the diverse backgrounds of attendees and equipping them with the necessary skills to apply data analytics in their respective domains. By integrating real-world datasets and interactive exercises, the workshops promoted hands-on learning and critical problem-solving skills essential for data-driven decision-making.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Project Video: HDRFS Data Analytics Training Program

Report: 2026/2148788

Product Type: Posted Content

Published Status: Published

Published Date: 2025-08-18

Peer Reviewed: No

URL: https://www.youtube.com/watch?v=hD1us_GR6Ao

Title: Project Video: HDRFS Data Analytics Training Program

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Mayara Cueto-Diaz / Nevada System of Higher Education

Authors Imported from DOI:

Title: Remotely monitored Ponderosa pine forest after wildfire

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL:

Title: Remotely monitored Ponderosa pine forest after wildfire

Abstract:

Wildfires have increased in frequency and severity over the past four decades, leading to the conversion of forests into non-forest shrublands or grasslands. This shift particularly concerns Ponderosa pine forests, where post-fire recovery is uncertain. Remote sensing provides a valuable tool for monitoring vegetation recovery in these ecosystems. Our study aimed to understand why some burned Ponderosa pine forests fail to return to their pre-fire plant communities. Specifically, we addressed: 1) seasonal changes in Normalized Difference Vegetation Index (NDVI) values in burned Ponderosa pine forests, and 2) the temporal changes in object-based image analysis classification post-wildfire. To investigate these questions, we quantified NDVI changes and plant cover at two post-wildfire sites in Arizona and Nevada. Summer NDVI values suggest some vegetation recovery, but winter NDVI values derived from Landsat imagery indicate a persistent transition in plant communities 10- and 20 years post-wildfire. Higher-resolution imagery further reveals that Ponderosa pine cover remains below 10% at both sites, underscoring a significant shift away from the pre-fire plant community. These findings highlight the long-term ecological consequences of increasing wildfire severity.

Forum Name: UNLV Life Sciences Colloquium

Details:

UNLV Life Sciences graduate student colloquium

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Keegan Hammond / University of Nevada-Las Vegas

Matthew Petrie / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Research Unplugged Series - Support and Development for Research Scholars of the Undergraduate Research Opportunity Program (UROP)

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Research Unplugged Series - Support and Development for Research Scholars of the Undergraduate Research Opportunity Program (UROP)

Abstract:

Forum Name: NSF EPSCOR HDRFS EWFD

Details:

Quarterly Zoom Professional Development, support and networking for undergraduate research scholars of HDRFS UROP. Session dates for 2025-2026 UROP scholars:

October 3, 2025 - Onboarding and UROP Kickoff

November 4, 2025 - Building Research Network - WK 6 checkin

January 30, 2026 - Research Reflection & Recharge

March 6, 2026 - Presenting Your Research - Effective Communication Strategies & Poster Presentations

April 24, 2026 - Research Roots & Career Routes

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: UROP Onboarding Package_Scholars & Mentors.pdf

Contributors:

Michele Casella / Nevada System of Higher Education

Authors Imported from DOI:

Title: Revealing the Invisible: Seeing Nature in Full, From a Few to the Many Integrating Semantic Segmentation and Pointwise Prediction for UAV-Based Plot Analysis and Environmental Monitoring

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Revealing the Invisible: Seeing Nature in Full, From a Few to the Many Integrating Semantic Segmentation and Pointwise Prediction for UAV-Based Plot Analysis and Environmental Monitoring

Abstract:

Forum Name: Rebel Grad Slam 2025

Details:

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Bijoya Bhattacharjee / University of Nevada-Las Vegas

Brendan Morris / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Science Communication Skills for Graduate Research Assistants

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Science Communication Skills for Graduate Research Assistants

Abstract:

Forum Name: HDRFS Annual Meeting 2025

Details:

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Meghan Collins / Desert Research Institute

Authors Imported from DOI:

Title: Sensitivity of backscattering to spherical particle physical properties: Size, refractive index, and shape deviations

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2024-12-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.jqsrt.2024.109204>

Title: Sensitivity of backscattering to spherical particle physical properties: Size, refractive index, and shape deviations

DOI: 10.1016/j.jqsrt.2024.109204

Forum Name: Journal of Quantitative Spectroscopy and Radiative Transfer

Details:

Publisher: Elsevier BV

Volume: 329

Issue:

Page: 109204

ISSN: 0022-4073

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Prakash Gautam / Desert Research Institute

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Justin B. Maughan

Christopher M. Sorensen

Title: Simulating Pyrocumulonimbus Clouds Using a Multiscale Wildfire Simulation Framework

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-09-05

Peer Reviewed: Yes

URL: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2024GL114025>

Title: Simulating Pyrocumulonimbus Clouds Using a Multiscale Wildfire Simulation Framework

Abstract:

Pyrocumulonimbus (pyroCb) clouds, driven by extreme fires under favorable meteorological conditions, can inject smoke into the stratosphere at magnitudes comparable to those of moderate volcanic eruptions, potentially altering the global radiative balance and atmospheric composition. However, simulating pyroCb is particularly challenging in Earth system models. Using the Energy Exascale Earth System Model (E3SM), we developed a novel global multiscale framework to model pyroCb events in California, which includes a high-resolution fire radiative power time series, a one-dimensional plume-rise parameterization, a fire-induced vertical water vapor transport scheme, and a surface wildfire sensible heat flux representation. Our simulation successfully reproduces many pyroCb features, including cloud height, spatiotemporal evolution, and convective intensity in comparison with satellite and ground-based observations. Sensitivity experiments show that realistic pyroCb simulation depends on vertical water vapor transport. These advances provide a basis for future exploration of pyroCb impacts at regional and global scales within climate models

Forum Name: Geophysical Research Letters

Details:

Geophysical Research Letters is a prominent peer-reviewed journal that publishes high-impact research across all geoscience disciplines, focusing on concise articles with broad implications.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: [GRL_Accepted_Combined_with_FigureLabels.pdf](#)

Contributors:

Ziming Ke / Desert Research Institute

Authors Imported from DOI:

Title: Simultaneous adsorption and hydrolysis of insensitive munition compounds by pyrogenic carbonaceous matter (PCM) and functionalized PCM in soils

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-08-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.jhazmat.2025.138501>

Title: Simultaneous adsorption and hydrolysis of insensitive munition compounds by pyrogenic carbonaceous matter (PCM) and functionalized PCM in soils

DOI: 10.1016/j.jhazmat.2025.138501

Forum Name: Journal of Hazardous Materials

Details:

Publisher: Elsevier BV

Volume: 494

Issue:

Page: 138501

ISSN: 0304-3894

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Wael Abdelraheem

Samuel A. Beal

Joseph J. Pignatello

Title: Simultaneous Adsorption and Hydrolysis of Insensitive Munitions (IMX-101) by Pyrogenic Carbonaceous Matter in Soils

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Simultaneous Adsorption and Hydrolysis of Insensitive Munitions (IMX-101) by Pyrogenic Carbonaceous Matter in Soils

Abstract:

Forum Name: Society of Environmental Toxicology and Chemistry (SETAC) North America 45th Annual Meeting, Fort Worth, TX, October 2024

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Title: Smoke-shading drives thermally forced circulations resulting in hazardous smoke inundation.

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: Yes

URL:

Title: Smoke-shading drives thermally forced circulations resulting in hazardous smoke inundation.

Abstract:

On 11 Sept. 2022 hazardous near-surface smoke concentrations, locally exceeding 1000 $\mu\text{g m}^{-3}$, inundated Reno, NV. The smoke arrived due to cross-mountain transport of a surface-based smoke layers originating from the Mosquito fire, burning on the west slopes of the Sierra Nevada (near Auburn, CA). This study demonstrates that the mechanism for the cross-barrier smoke transport was a thermally-driven circulation caused by differential air mass heating due to reduced insolation in the smoke layer, and thus reduced daytime sensible heating. In this case the thermally driven circulation superimposed on the normal diurnally-varying thermally-driven circulations in the Sierra Nevada (e.g., the Washoe Zephyr), with the superposition resulting in a much stronger than normal cross mountain wind system. Our analysis traces the coherent progression of the thermally-driven smoke front through a network of hundreds of citizen operated air quality sensors (i.e., the PurpleAir™ network). We show that the smoke front originated in nocturnally-pooled smoke near Auburn, CA then progressed eastward across the Sierra crest passing through the town of Truckee, CA before arriving in Reno, NV in the late afternoon. Evaluated over a set of >300 spatially distributed sensors the smoke frontal passage is consistently marked by rapid rises in PM_{2.5}, often exceeding 400 $\mu\text{g m}^{-3}$ in under 30 minutes, large drops in temperature (>10° C in some cases), and a rapid increase in post frontal winds (Fig. 1a,b). While the smoke front progressed as a coherent air mass boundary, we find that the magnitude of the jump in smoke concentration decreases with time, suggesting that entrainment of clear air slowly dilutes the frontal boundary with time. We also examine vertically pointed Doppler lidar observations and co-located sonic anemometer turbulence data as the smoke front passed over the University of Nevada, Reno. These data reveal that the smoke front exhibits the canonical structure and dynamics of a gravity (a.k.a. density) current, marked by a surface-based flow of cold (dense) air, an elevated frontal head with a narrow leading updraft, and interfacial wave mixing along the top of the smoke layer (Fig. 1c,d). The flow behind the front was vigorous (>10 m/s) and was characterized by strong mechanically generated turbulence. Similar smoke fronts were observed over subsequent days and along different portions of the Sierra Nevada, demonstrating that this differential heating mechanism and thermally driven circulations is an important consideration for smoke transport modeling and in evaluating local and regional smoke impacts associated with large wildland fires.

Forum Name: 21st Conference on Mountain Meteorology. American Meteorological Society.

Details:

<https://www.ametsoc.org/index.cfm/ams/meetings-events/ams-meetings/21st-conference-on-mountain-meteorology/>

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: SMOKE_DENSITY_CURRENT_MOUNTAIN_MET.pdf

Contributors:

Neil Lareau / University of Nevada-Reno

Joseph Marino / University of Nevada-Reno

Authors Imported from DOI:

Title: Soil Moisture Partitioning Between Under Canopy and Interspace Environments in Shrublands of the Northern Chihuahuan Desert

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2025-07-07

Peer Reviewed: Yes

URL: <https://link.springer.com/article/10.1007/s10021-025-00987-4>

Title: Soil Moisture Partitioning Between Under Canopy and Interspace Environments in Shrublands of the Northern Chihuahuan Desert

Abstract:

Soil moisture is a key link between hydrologic and ecologic processes in desert shrublands. Understanding how soil moisture is spatially distributed in desert shrublands provides valuable insights into how shrubs use and impact limiting water resources, and how shrublands may respond to future meteorological and climate change. Our goals were to determine how soil moisture is partitioned between soil volumes under canopies and in the bare soil interspaces across multiple desert shrublands, and to evaluate the roles of physical soil properties, shrub-type characteristics, meteorology, and measurement resolution in influencing and observing variation in soil moisture partitioning. Utilizing two long-term soil moisture datasets (monthly resolution, 30 years, whole soil profile measurements; and 30 min resolution, 10 years, 10–30 cm measurements), we compared soil moisture partitioning across nine northern Chihuahuan Desert shrubland sites (three sites dominated by creosotebush [*Larrea tridentata*], three by honey mesquite [*Prosopis glandulosa*], and three by tarbush [*Flourensia cernua*]) in the Jornada Basin, southern New Mexico, USA. Over 30 years, monthly, whole profile data showed that soil moisture in mesquite shrublands was consistently higher in bare soil interspaces compared to under canopies, whereas soil moisture under and between shrubs was more similar in creosotebush and tarbush shrublands. Physical soil properties were linked as explanatory variables of long-term soil moisture partitioning (monthly whole profile dataset), whereas 30-minute data showed that shorter-term periods of higher precipitation promoted greater near surface soil moisture (10–30 cm) in bare soil interspaces that was not captured at monthly time steps. Thus, although the long-term average partitioning of soil moisture in these shrublands is strongly controlled by soil physical properties, soil moisture partitioning varies at shorter timescales (daily to weekly) in response to precipitation events. Moreover, shrub-type characteristics influenced soil moisture partitioning, with dense and tall mesquite shrubs having lower under canopy soil moisture than tarbush, and root architecture potentially influencing partitioning across creosotebush sites. These results illustrate diversity in soil moisture partitioning both between and within shrublands of the northern Chihuahuan Desert, and elucidate how physical soil properties, shrub-type characteristics, and meteorological variation interact to shape their soil moisture dynamics.

Forum Name: Ecosystems

Details:

Open Access

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

Keegan Hammond / University of Nevada-Las Vegas

Matthew Petrie / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: SQL and Python workshop 0 06/05/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 0 06/05/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 0_SQL&Python25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: SQL and Python workshop 1 06/23/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 1 06/23/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 1_SQL&Python25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: SQL and Python workshop 2 07/10/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 2 07/10/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 2_SQL&Python.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: SQL and Python workshop 3 07/24/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 3 07/24/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 3_SQL&Python25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: SQL and Python workshop 4 08/14/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 4 08/14/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 4_SQL&Python25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: SQL and Python workshop 5 08/28/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 5 08/28/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 5_SQL&Python25.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: SQL and Python workshop 6 09/11/25

Report: 2026/2148788

Product Type: Workshop Report

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: SQL and Python workshop 6 09/11/25

Abstract:

RII Support: Primary

Federal Support Acknowledged:

Attached Document: 6_SQL&Python.pdf

Contributors:

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Study of linear depolarization ratios across a wide range of scattering angles for particles of diverse sizes, shapes, and complex refractive indices

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2026-03-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.jqsrt.2025.109761>

Title: Study of linear depolarization ratios across a wide range of scattering angles for particles of diverse sizes, shapes, and complex refractive indices

DOI: 10.1016/j.jqsrt.2025.109761

Forum Name: Journal of Quantitative Spectroscopy and Radiative Transfer

Details:

Publisher: Elsevier BV

Volume: 350

Issue:

Page: 109761

ISSN: 0022-4073

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

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Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Kurt Ehlers

Justin B. Maughan

Christopher M. Sorensen

Title: Study of Linear Depolarization Ratios Across a Wide Range of Scattering Angles for Particles of Diverse Sizes, Shapes, and Complex Refractive Indices

Report: 2026/2148788

Product Type: Posted Content

Published Status: Published

Published Date: 2025-01-01

Peer Reviewed: No

URL: <https://doi.org/10.2139/ssrn.5195341>

Title: Study of Linear Depolarization Ratios Across a Wide Range of Scattering Angles for Particles of Diverse Sizes, Shapes, and Complex Refractive Indices

DOI: 10.2139/ssrn.5195341

Details:

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Prakash Gautam / Desert Research Institute

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Authors Imported from DOI:

Kurt Ehlers

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Title: Superposition of Smoke-Induced Density Currents and Diurnal Wind Systems during the California Mosquito Fire

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: Yes

URL:

Title: Superposition of Smoke-Induced Density Currents and Diurnal Wind Systems during the California Mosquito Fire

Abstract:

Wildfire smoke can drive intense near-surface density currents that rapidly inundate populated areas with hazardous air, producing extreme and prolonged smoke exposure with serious health consequences. Yet the dynamics of these flows remain poorly understood. We document two such events during the September 2022 Mosquito Fire, when smoke-driven currents caused abrupt and severe air-quality degradation along the east side of the Sierra Nevada. Observations from a dense PurpleAir sensor network, meteorological instruments, and Doppler lidar reveal sharp $PM_{2.5}$ increases of 200–1000 $\mu\text{g m}^{-3}$, temperature drops of 3–4 $^{\circ}\text{C}$, and wind shifts characteristic of density-current propagation. The smoke currents evolved in concert with the regional Washoe Zephyr, illustrating how local radiative forcing and regional thermally driven flows can interact to organize and intensify smoke transport. The observed cooling—arising from strong radiative heat loss within optically thick smoke—enhanced horizontal density contrasts that drove and sustained the advancing flow. The currents exhibited canonical structure: a sharp leading edge, a turbulent head with vigorous mixing, and deep smoke-filled air intruding beneath the prefrontal layer. Propagation speeds of roughly 4 m s^{-1} matched theoretical scaling based on temperature deficits, current depth, and opposing winds. These findings show that radiative cooling within dense smoke layers can amplify and sustain smoke-induced density currents, prolonging hazardous air-quality impacts across complex terrain.

Forum Name: Journal of Geophysical Research - Atmospheres

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: Marino_Lareau_JRGA_small.pdf

Contributors:

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Joseph Marino / University of Nevada-Reno

Authors Imported from DOI:

Title: SwinVFTR: A Novel Volumetric Feature-Learning Transformer for 3D OCT Fluid Segmentation

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-05-12

Peer Reviewed: Yes

URL:

Title: SwinVFTR: A Novel Volumetric Feature-Learning Transformer for 3D OCT Fluid Segmentation

Abstract:

Forum Name: ISBI

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

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Alireza Tavakkoli / University of Nevada-Reno

Authors Imported from DOI:

Title: Tailored Carbonaceous Materials as Biofilter Amendments for Per- and Polyfluoroalkyl Substances Removal in Stormwater Runoff

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Tailored Carbonaceous Materials as Biofilter Amendments for Per- and Polyfluoroalkyl Substances Removal in Stormwater Runoff

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Nourin Seenthia / University of Nevada-Reno

Authors Imported from DOI:

Title: Tailored carbonaceous materials as biofilter amendments for PFAS removal in stormwater runoff

Report: 2026/2148788

Product Type: Journal Article

Published Status: Published

Published Date: 2026-01-01

Peer Reviewed: Yes

URL: <https://doi.org/10.1016/j.watres.2025.124569>

Title: Tailored carbonaceous materials as biofilter amendments for PFAS removal in stormwater runoff

DOI: 10.1016/j.watres.2025.124569

Forum Name: Water Research

Details:

Publisher: Elsevier BV

Volume: 288

Issue:

Page: 124569

ISSN: 0043-1354

RII Support: Primary

Federal Support Acknowledged:

Attached Document:

Contributors:

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Authors Imported from DOI:

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James C. Magee

Bridget Wadzuk

Title: Teachers' Perspectives on Wildfires

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Published

Published Date: 2025-11-16

Peer Reviewed: No

URL: <https://www.ssma.org/assets/SSMA%202025%20Proceedings.pdf>

Title: Teachers' Perspectives on Wildfires

Abstract:

Forum Name: School Science and Mathematics Association Annual Convention

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Merryn Cole / University of Nevada-Las Vegas

Debika Jana / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Teachers' Understanding About Ecological Benefits of Wildfire

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: Yes

URL:

Title: Teachers' Understanding About Ecological Benefits of Wildfire

Abstract:

Forum Name: School Science and Mathematics Association Annual Convention

Details:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Merryn Cole / University of Nevada-Las Vegas

Debika Jana / University of Nevada-Las Vegas

Authors Imported from DOI:

Title: Technical Report – Data: Measurements of Soil Moisture, Infiltration, and Hydrophobicity in Yosemite National Park Across Differing Fire Histories

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Technical Report – Data: Measurements of Soil Moisture, Infiltration, and Hydrophobicity in Yosemite National Park Across Differing Fire Histories

Abstract:

Forum Name: Water Resources Research

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Markus Berli / Desert Research Institute

Gabrielle Boisrame / Desert Research Institute

Authors Imported from DOI:

Title: Ten Winters' Tales

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: No

URL:

Title: Ten Winters' Tales

Abstract:

Forum Name: Yosemite Hydroclimate Meeting

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: Boisrame_YosHydro_TenWinters_2025.pdf

Contributors:

Gabrielle Boisrame / Desert Research Institute

Authors Imported from DOI:

Title: Testing for Radial Translocation of Hg in Tree Rings after a Fire Event

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: No

URL:

Title: Testing for Radial Translocation of Hg in Tree Rings after a Fire Event

Abstract:

Mercury (Hg) exposure is of global concern due to its harmful effect on health of humans and other organisms. Environmental archives, such as Hg measured in ice, sediment, and peat bog cores have been used to determine historical trends in atmospheric concentrations. Tree rings are also useful for recording trends in historical atmospheric concentrations, as they assimilate Hg into annual rings derived from leaf uptake. Trees are good archives, because they can be accurately dated, are broadly distributed, and are easier to sample and store. One issue that has been identified in using tree rings as archives is the possibility of radial translocation of Hg across a tree's sapwood. In this study, three tree stands impacted by different burn severity (high, medium, low) in the area affected by the 2021 California Dixie Fire were investigated. At each site, ten Jeffrey pines (*Pinus jeffreyi*) were repeatedly cored from 2022-2024, and rings for each collection period analyzed annually using EPA Method 7473 that uses thermal decomposition to release Hg from the wood. Preliminary results indicate that a site highly impacted by the fire showed increased concentrations in the year of the fire, and this was retained in the 2021 ring into 2024.

Forum Name: AAG 2025 Annual Event

Details:

I will be presenting my project in a Poster session on March 26, 2025 in the Dendrochronology V session. The wider Hg project grant is paying for my travels, but the RII is paying for the poster and the research conducted. I am going with Dr. Adam Csank.

RII Support: Partial

Federal Support Acknowledged:

Attached Document:

Contributors:

Monica Arienzo / Desert Research Institute

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Heather Haines / University of Nevada-Reno

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Authors Imported from DOI:

Title: The 2021 Bootleg Fire: A Hydrological Perspective through Remote Sensing and Machine Learning

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: The 2021 Bootleg Fire: A Hydrological Perspective through Remote Sensing and Machine Learning

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: The 2021 Bootleg Fire A Hydrological Perspective through Remote Sensing and Machine Learning.pdf

Contributors:

Haroon Sahotra / University of Nevada-Las Vegas

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Authors Imported from DOI:

Title: The 2024 Mill Fire: Insights from Field Observations and WRF-FIRE Simulations of Fuel Loading, Fire-Induced Convection, and PyroCb Development

Report: 2026/2148788

Product Type: Poster

Presentation Status: Presented

Presented Date:

Peer Reviewed: Yes

URL:

Title: The 2024 Mill Fire: Insights from Field Observations and WRF-FIRE Simulations of Fuel Loading, Fire-Induced Convection, and PyroCb Development

Abstract:

The 2024 Mill Fire, part of the Gold Complex Fire, near Portola, CA, USA, was ignited by lightning strikes on 22-July-2024 at three distinct locations and produced a surprisingly large and intense pyrocumulonimbus (pyroCb) cloud despite its relatively small burned area (~12 km²). To investigate this event, we combine field-based post-fire observations with wildfire-atmosphere simulations using WRF-FIRE. Field surveys conducted shortly after the fire provided critical information on ignition points, burn severity, vegetation conditions, and recent forest management activities. Two simulation setups were developed: one using the default WRF-FIRE configuration, and another constrained by the observed fire perimeter. Both simulations underestimated plume height and fire-induced convection intensity compared to satellite and radar observations. Sensitivity experiments revealed that substantially increasing fuel loading near the fire center was necessary to reproduce the observed pyroCb development. Field observations also documented crown fire behavior, suggesting that combustion extended beyond surface fuels. Enhanced fuel loading not only intensified fire-induced convection but also influenced fire spread by modifying local wind fields through fire-atmosphere coupling. Additionally, field teams observed the effects of recent fuel reduction efforts along an unpaved road. When the effects of this management activity were incorporated into the model, the simulated fire perimeter more closely aligned with observations. This study highlights the importance of integrating field observations with coupled fire-atmosphere modeling to understand extreme wildfire behavior. The results underscore the critical role of high-resolution, up-to-date fuel information in simulating pyroCb events and demonstrate the effectiveness of targeted fuel management practices in mitigating wildfire propagation and impacts.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: AMS-MillsFire-Poster-Ke1.pdf

Contributors:

Eden Furtak-Cole / Desert Research Institute

Ziming Ke / Desert Research Institute

Neil Lareau / University of Nevada-Reno

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Title: The DropBot: Design and Development of a Custom Drone for Precision WDPT

Report: 2026/2148788

Product Type: Dissertation/Thesis

Published Status: Published

Published Date: 2025-08-04

Peer Reviewed: No

URL:

Title: The DropBot: Design and Development of a Custom Drone for Precision WDPT

Abstract:

Assessing the hydrophobic characteristics of soil is vital for understanding soil wettability or soil-water interactions, particularly in post-wildfire environments where water repellency can significantly impact ecosystem recovery, water infiltration, and erosion control. One key metric in soil wettability studies is the Water Drop Penetration Time (WDPT), which evaluates the hydrophobicity of soil and guides land treatment strategies. This thesis presents the design and development of DropBot, a custom-built drone platform engineered for the precise delivery and analysis of water droplets in WDPT tests. The DropBot, a custom drone, integrates a lightweight, 3D-printed frame with a self-leveling platform, enabling consistent droplet deployment and testing across varied terrains. The system is equipped with modular manipulators, a custom droplet release mechanism, and multiple onboard sensors for environmental feedback. The DropBot is operated using the Robot Operating System (ROS) framework, allowing for scalable sensor integration, data acquisition, and autonomous behavior. The development process included iterative mechanical design, sensor calibration, and field testing to ensure precision, stability, and repeatability. Experimental results demonstrate the DropBot's ability to accurately deliver water droplets with controlled positioning and timing, validating its utility for in-situ WDPT tests. This work also contributes to the growing field of agricultural robotics and sets the stage for further enhancements, such as computer vision integration for surface detection and fully autonomous mission planning for soil property mapping.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Mugundan Prakash / Desert Research Institute

Authors Imported from DOI:

Title: The Effects of Smoke from Wildfires in the Western US on Urban Air Quality in Northern Nevada

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: Yes

URL:

Title: The Effects of Smoke from Wildfires in the Western US on Urban Air Quality in Northern Nevada

Abstract:

Forum Name: Atmospheric Pollution Research

Details:

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Andrey Khlystov / Desert Research Institute

Vera Samburova / Desert Research Institute

Authors Imported from DOI:

Title: The Effects of Wildfire on Water Availability in Semi-Arid Great Basin Shrublands

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL: <https://www.nvwra.org/2025-ac-program>

Title: The Effects of Wildfire on Water Availability in Semi-Arid Great Basin Shrublands

Abstract:

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: nwra poster SSC (1).pdf

Contributors:

Scott Allen / University of Nevada-Reno

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Abigail Sandquist / University of Nevada-Reno

Authors Imported from DOI:

Title: The influence of antecedent moisture content (AMC) on infiltration into water repellent soil: Laboratory experiments and model calculations

Report: 2026/2148788

Product Type: Conference Proceedings

Published Status: Published

Published Date: 2025-04-30

Peer Reviewed: No

URL:

Title: The influence of antecedent moisture content (AMC) on infiltration into water repellent soil: Laboratory experiments and model calculations

Abstract:

The sensitivity of infiltration rate to antecedent moisture content (AMC) in wettable soils is well-established with a low AMC promoting a higher initial infiltration rate. For water repellent soils, such as those found on fire-affected landscapes, we know little about how AMC may affect infiltration. Here we seek to understand how AMC affects infiltration for sub-critically water repellent soils (soils for which water forms a contact angle $<90^\circ$). We conducted laboratory experiments using uniform #40-70 quartz sand with different degrees of water repellency from which we developed a process-based model for simulating sorptivity and infiltration rate as a function of AMC. The experiments exhibited a highly non-linear relationship between contact angle and initial saturation degree (as a direct measure for AMC). We found the observed contact angle of water repellent sand was highest for air-dry conditions (as expected) but decreased rapidly with increasing initial saturation degree (AMC). Sorptivity of water repellent sand (which integrates wettability, pore sizes and AMC), exhibited a local minimum at the air-dry condition; a maximum for initial saturation degrees between 3% and 6%; then again a local minimum for initial saturation degree near 40%. Using the developed model along with measured contact angles and associated sorptivity values, maximum infiltrates were associated with an initial saturation degree around 5%. Thus, for water repellent soils, the maximum infiltration rates are associated with slightly moist rather than air-dry AMC. Model simulations also agreed well, qualitatively, with field-measured sorptivity data collected from a fire-affected, water repellent loam in Wyoming, USA. This research was supported by the U.S. National Science Foundation under Grant Nos EAR#1324894 and OIA-2148788 as well by the US Army Corps of Engineers under Grant Numbers DACW42-03-2-0000 and W912HZ17C0037.

Forum Name: European Geosciences Union (EGU)

Details:

EGU General Assembly

27 April–2 May 2025

Vienna, Austria

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: EGU25-13946-print.pdf

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Rose Shillito / USACE Engineer Research and Development Center (ERDC), Coastal and Hydraulics Laboratory (CHL),
Authors Imported from DOI:

Title: The Role of Fire Processes in Pyrocumulonimbus Formation and of Fire-Induced Lightning in Spot Fire Ignition: Case Studies of the Creek and Dixie Fires

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Presented

Presented Date:

Peer Reviewed: Yes

URL:

Title: The Role of Fire Processes in Pyrocumulonimbus Formation and of Fire-Induced Lightning in Spot Fire Ignition: Case Studies of the Creek and Dixie Fires

Abstract:

Pyrocumulonimbus (pyroCb) clouds produced by intense wildfires can inject smoke into the upper troposphere and lower stratosphere, with significant implications for weather, climate, and air quality. However, the role of fire-emitted aerosols in pyroCb formation and of fire-induced lightning in spot fire ignition remains poorly understood. In this study, we investigate two California, USA wildfires, the 2020 Creek Fire and the 2021 Dixie Fire using Energy Exascale Earth System Model multiscale wildfire modeling framework. Sensitivity experiments with and without fire-emitted aerosols are conducted to quantify their influence on cloud formation, convective intensity, and vertical moisture transport. Model results are evaluated against satellite and radar observations to assess the structure, timing, and evolution of pyroCb clouds. We further explore the fire-induced convection system and its lightning potential by integrating high-resolution lightning detection data. The spatial and temporal correspondence between pyroCb cloud formation and lightning strikes is analyzed to understand how wildfire-driven convection contributes to lightning generation. Special attention is given to the possibility of fire-induced lightning igniting secondary spot fires, which can increase rate and extent of fire spread under extreme conditions. This work highlights the coupled roles of fire aerosols and lightning in pyroCb evolution and underscores the need to represent these processes in fire-atmosphere models for improved hazard prediction and mitigation

Forum Name: American Meteorological Society

Details:

AMS annual meeting 2026 (25-29 Jan.) in Houston, TX.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: AMS2026_Ke_pyroCb_wildfire_lightning.pdf

Contributors:

Ziming Ke / Desert Research Institute

Hans Moosmüller / Desert Research Institute

Authors Imported from DOI:

Title: The Role of Wildfire on Water Cycling in Semi-Arid Shrubland Plants in the Great Basin

Report: 2026/2148788

Product Type: Other

Other Type Description: Student Poster

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL: <https://www.nvwra.org/2025-ac-program>

Title: The Role of Wildfire on Water Cycling in Semi-Arid Shrubland Plants in the Great Basin

Abstract:

The Role of Wildfire on Water Cycling in Semi-Arid Shrubland Plants in the Great Basin
Sydney S. Corcoran, M.S. Hydrologic Sciences University of Nevada, Reno 1664 North Virginia Street Reno, Nevada 89557 scorcoran@unr.edu 402-218-0534 Abigail Sandquist, University of Nevada, Reno Scott Allen, University of Nevada, Reno Wildfires in the Great Basin are becoming more frequent and intense, yet their impacts on vegetation communities and the regional water balance remain poorly understood. It is known that deep-rooted sagebrush recovers slowly after fire, while shallow-rooted forbs and annual grasses proliferate after disturbances. Vegetation with deeper root systems typically rely on stored water, a greater capacity to deplete soil water reserves. In this study, we measured predawn water potential and soil moisture—proxies for water stress—at eight paired burned and unburned sites that experienced fire within the past 15 years. Preliminary findings indicate that unburned, shrub-dominated sites exhibit higher water stress due to greater depletion of soil moisture reserves.

RII Support: Primary

Federal Support Acknowledged: Yes

Attached Document: Corcoran, Sydney_NWRASStudentPosterAbstract.pdf

Contributors:

Sydney Corcoran / University of Nevada-Reno

Authors Imported from DOI:

Title: Title: Structured Support Series for Data Analytics Certification Students: Mentoring, Collaboration, and Engagement - To enhance student engagement and learning outcomes in the Data Analytics Certification program

Report: 2026/2148788

Product Type: Other

Other Type Description: Other

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: Title: Structured Support Series for Data Analytics Certification Students: Mentoring, Collaboration, and Engagement - To enhance student engagement and learning outcomes in the Data Analytics Certification program

Abstract:

Initiative engaged 2024 DA Cert students and included the organization of a dedicated Discord communication channel, designed to facilitate structured discussions on coding challenges, collaborative problem-solving, FAQs, and project showcases. This platform enabled continuous peer-to-peer and mentor-guided interactions, ensuring a dynamic learning environment. By offering tailored support and fostering an interactive community, this initiative significantly improved student retention, motivation, and skill development throughout the certification program.

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document:

Contributors:

Emily Huerta / University of Nevada-Las Vegas

Ilaria Vinci / University of Nevada-Reno

Authors Imported from DOI:

Title: Towards Perpetually-Deployable Ubiquitous Aerial Robotics: An Amphibious Self-Sustainable Solar small-UAS

Report: 2026/2148788

Product Type: Conference Proceedings Article

Published Status: Submitted

Published Date:

Peer Reviewed: Yes

URL: <https://2025.ieee-icra.org/>

Title: Towards Perpetually-Deployable Ubiquitous Aerial Robotics: An Amphibious Self-Sustainable Solar small-UAS

Abstract:

This work deals with the problem of unlocking perpetual deployment capabilities for small-UAS robotics across the diverse settings of the real world and their challenges, encompassing considerations for marine environments alongside the more common terrestrial ones. Via the progress made within this scope, a step towards truly ubiquitous and self-sustainable aerial robotics is accomplished. The work consists of the development of the Gannet Solar-VTOL, a waterproof small-UAS that is capable of resting on the surface of water for prolonged periods of time and over varying temperature ranges, while harvesting solar power to recharge itself. Equally importantly, it integrates a field-proven Self-Sustainable Autonomous System architecture that allows it to hibernate and sustain its battery charge overnight or during periods of solar illumination scarcity, as well as to assess mission-critical parameters (e.g., water surface turbulence, ambient temperature of battery compartment) on the low-power side of the Power Management Stack, and react appropriately. Finally, the robot is equipped with an onboard camera and a Neural Processing Unit that allows it to perform in-field environmental monitoring operations (e.g., wildfire detection). This paper experimentally demonstrates the aforementioned capabilities, and concludes with a presentation of the amphibious small-UAS' long-term deployment within a marine environment in the N.Nevada region, spanning over 3 consecutive days.

Forum Name: IEEE International Conference on Robotics and Automation (ICRA)

Details:

#1-ranked in Robotics:

https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=eng_robotics

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: GANNET_ICRA_2025_Final_Version.pdf

Contributors:

Christos Papachristos / University of Nevada-Reno

Authors Imported from DOI:

Title: UAV-based Foliage Plant Species Classification for Semantic Characterization of Pre-Fire Landscapes

Report: 2026/2148788

Product Type: Journal Article

Published Status: Submitted

Published Date:

Peer Reviewed: No

URL:

Title: UAV-based Foliage Plant Species Classification for Semantic Characterization of Pre-Fire Landscapes

RII Support: Partial

Federal Support Acknowledged: Yes

Attached Document: UAV-based Foliage Plant Species Classification for Semantic Characterization of Pre-Fire Landscapes_submitted.pdf

Contributors:

Christos Papachristos / University of Nevada-Reno

Authors Imported from DOI:

Title: Urban Indoor Air Quality Disparities Amplified by Wildfire Smoke: Insights from the Mosquito Fire Episode in Reno, Nevada

Report: 2026/2148788

Product Type: Other Conference Presentation/Paper

Presentation Status: Submitted

Presented Date:

Peer Reviewed: Yes

URL:

Title: Urban Indoor Air Quality Disparities Amplified by Wildfire Smoke: Insights from the Mosquito Fire Episode in Reno, Nevada

Abstract:

Urban Indoor Air Quality Disparities Amplified by Wildfire Smoke: Insights from the Mosquito Fire Episode in Reno, Nevada L.-W. Antony Chen* , Alireza Rezaee, Olufunminire Onamuti University of Nevada Las Vegas, Las Vegas, NV, USA
*Corresponding email: Antony.Chen@unlv.edu Wildfire smoke is a significant environmental hazard, particularly affecting air quality in the Western United States. The smoke consists of a complex mixture of gases and fine particles, primarily PM2.5. When wildfire smoke blankets urban areas, it not only elevates ambient PM2.5 concentrations but also disparities in PM2.5 exposure due to heterogeneous spatial distributions. This disparity is likely even more pronounced in indoor environments, as buildings with poor sealing or inadequate filtration may be more affected by smoke compared to those with well functioning air handling systems. Using the PurpleAir® network, this study investigates outdoor and indoor PM2.5 exposure and disparities during a persistent smoke episode in Reno, Nevada, caused by the Mosquito Fire in September 2022. Hourly PM2.5 data were retrieved from 42 outdoor and 19 indoor sensors operational between September and November 2022. Daily air quality index (AQI) values were calculated and categorized into six exposure levels: Good, Moderate, Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, and Hazardous. The number of sensors in each exposure level further inferred exposure disparity, as measured by the Gini Index (GI). During September, in periods without wildfire smoke, the outdoor GI was consistently 0 (no disparity), while the indoor GI was < 0.08, with several indoor AQI readings above the "Good" level. When smoke hit Reno (9/7-9/17, 2022), 33 outdoor sensors reported AQI values of "Very Unhealthy" and above, with the outdoor GI ranging from 0.02 to 0.17 and stabilizing around 0.05 most of the time. In contrast, indoor AQI values were generally below the "Very Unhealthy" level, but the indoor GI ranged from 0.09 to 0.30, exceeding 0.25 most of the time. This study provides evidence that natural disasters such as wildfires can exacerbate health disparities related to housing conditions in urban areas, thus informing public health actions towards vulnerable populations. Keywords: Air quality sensor, Gini Index, wildfire smoke, indoor exposure

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Title: Using Fire Science Lessons to Grow as an Environmental Science Pre-Service Teachers in NevadaTeach, by Bryce Peterson and Aaron Mastin, supported by Nick Nemsgern. Presented at UTeach Conference, May 2025, Reno, NV.

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Title: Video Analysis of Water Drop Penetration Time Using Temporal Action Localization for Evaluating Soil Water Repellency

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Title: Video Analysis of Water Drop Penetration Time Using Temporal Action Localization for Evaluating Soil Water Repellency

Abstract:

We present a system for the automated measurement of Water Drop Penetration Time (WDPT) that is commonly used for evaluating soil water repellency (SWR). Conventional manual measurements of WDPT are labor-intensive, subjective, tend to produce variability of out-comes, and are not available in remote and difficult-to-reach locations. The developed system performs a standardized WDPT test, estimates WDPT, and evaluates SWR. The entire process from drop landing on the soil surface to its complete absorption is modeled as a temporal action, and consequently, the WDPT estimation is solved using Temporal Action Localization (TAL) models. Two state-of-the-art TAL models are explored and compared: ActionFormer and TriDet. Although TriDet has a lower mean absolute error for fast absorption events, ActionFormer outperforms it by the average AP metric and the accuracy of SWR characterization.

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Title: Wildfire Detection and Segmentation: A Comprehensive Review

Abstract:

Wildfires are increasingly recognized as one of the most pressing natural disasters, significantly impacting ecosystems, human health, and economic stability. The frequency and intensity of these events have escalated due to factors such as climate change, urban encroachment into wild-land areas, and unsustainable land management practices. This paper presents a comprehensive survey of current methodologies for wildfire detection and segmentation, focusing on advancements in machine learning and remote sensing technologies. Traditional methods often fall short in addressing the complexities associated with real-time detection and high-dimensional remote sensing data. In contrast, recent developments in deep learning, particularly Convolutional Neural Networks (CNNs) and U-Net architectures, demonstrate substantial improvements in detection accuracy and segmentation precision. Moreover, we discuss the role of transfer learning and data augmentation techniques in improving model generalization across varying environments. Despite the advancements, challenges remain, including the need for real-time monitoring capabilities and the reliance on labeled training datasets. The findings underscore the importance of a collaborative approach involving researchers, practitioners, and policymakers to develop innovative solutions for effective wildfire management. By providing a detailed analysis of current trends, gaps, and future research directions, this paper aims to contribute to the ongoing efforts to mitigate the devastating impacts of wildfires.

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