



DIVISION OF ATMOSPHERIC SCIENCES

WWW.DRI.EDU/DAS

THE DIVISION OF ATMOSPHERIC SCIENCES (DAS) conducts basic and applied research and provides services related to air quality and associated health risks, cloud and aerosol physics, atmospheric chemistry, climate, renewable energy, fire science, and atmospheric dynamics.

DAS researchers develop instrumentation for observations from the ground, unmanned and human-piloted aircraft, and satellites in addition to techniques for observational programs. Inorganic and organic chemistry laboratories provide trace analysis of atmospheric pollutants, supporting assessments of human impacts on air quality. The Division has extensive capabilities in numerical modeling of atmospheric and air pollution processes for meteorology, atmospheric dynamics, precipitation processes, atmospheric chemistry, aerosol formation, visibility assessments, urban air quality, and transport of pollutants in complex terrain.

DAS personnel operate primarily from office and laboratory facilities in Reno and Las Vegas, Nevada. An additional facility, the Storm Peak Laboratory, is located at a mountaintop location near Steamboat Springs, Colorado. Faculty and staff maintain \$20-30 million in active projects for federal, state, and local governments, Tribes, private industry, foundations, and universities.

As part of the Nevada System of Higher Education, DAS faculty administer and teach in the Atmospheric Sciences Graduate Program at the University of Nevada, Reno, where students conduct their research under the supervision of DAS faculty while working toward an M.S. or Ph.D. degree.

RESEARCH AREAS

- Air quality
- Atmospheric processes
- Characterization of pollutants
- Climatology & meteorology
- Wildland fire
- Modeling of the atmosphere
- Weather modification
- Exposure health effects



NEVADA SCIENCE, GLOBAL SOLUTIONS

The Desert Research Institute (DRI) is a recognized world leader in basic and applied interdisciplinary research. Committed to scientific excellence and integrity, DRI faculty, students, and staff have developed scientific knowledge and innovative technologies in research projects around the globe. Since 1959, DRI's research has advanced scientific knowledge, supported Nevada's diversifying economy, provided science-based educational opportunities, and informed policy makers, business leaders, and community members. With campuses in Reno and Las Vegas, DRI serves as the non-profit research arm of the Nevada System of Higher Education.

www.dri.edu | Follow us @DRIScience |    





DRI.EDU/DAS

LABORATORIES

Aerosol Physics Laboratory

Airborne Systems Testing and Environmental Research (ASTER) Lab

Biomass Combustion Facility

CEFA Operations and Forecast Facility

Cloud Microphysics and Aerosol Chemistry Laboratory

Dust Entrainment and Characterization Facility

Environmental Analysis Facility

Laboratory for Aerosol Science, Spectroscopy, and Optics (LASSO)

Meteorology Calibration Laboratory

Organic Analytical Laboratory

Particulate Emissions Measurement Laboratory

Source Characterization Laboratory

Storm Peak Laboratory: Mountaintop Research Facility

X-Ray Diffraction Analysis of Mineral Dusts in Aerosols



SERVICES & CAPABILITIES

AIR QUALITY MONITORING

- Automated filter-based samplers for aerosol and gas sampling
- Continuous aerosol mass, size distribution, optical properties, and composition
- Automated and passive sampling of volatile organic compounds
- Analysis of over 400 individual gas- and particle-phase organic compounds
- Measurements of emissions from marijuana growing facilities and impact on air quality
- Mobile measurements of spatial distribution of pollutants in urban areas

ATMOSPHERIC MODELING

- Photochemical air quality modeling
- Weather Research & Forecasting (WRF) model
- Computational fluid dynamics models
- Coupled atmospheric and hydrologic models
- Regional downscaling of climate/weather models
- Source apportionment and dispersion modeling
- Modeling of dust and atmospheric interactions at various scales

ENVIRONMENTAL HEALTH EFFECTS

- Characterization of first- and second-hand exposure to e-cigarette and cannabis aerosols
- Biomarkers of exposure assessment
- Air quality epidemiology studies

METEOROLOGY

- Use of satellite radiances to infer atmospheric structure
- Surface, column, and aircraft measurements of atmospheric motion and thermodynamics
- Wind & solar forecasting

- Cloud radiative properties from satellites and radars
- Particle size distribution and imaging by in-situ microphysical probes

POLLUTANT EMISSIONS CHARACTERIZATION

- Dilution chamber sampling of stationary source emissions
- Fugitive and area source emission sampling
- Emission factor and inventory development for modeling purposes

SOCIAL SCIENCE

- Experienced team leads for integrated physical-social projects
- Evaluation of projects, web tools, and research products
- Focus on use-inspired science and stakeholder engagement

STUDY DESIGN & COORDINATION

- Air quality program design
- Quality control & quality assurance
- Data compilation, validation, analysis, and reporting

WEATHER MODIFICATION

- Cloud seeding for snowfall enhancement
- Ultra-trace chemical analysis of snow
- UAS applications for applied atmospheric research

WILDLAND FIRE

- UAS applications for fire management support
- Wildfire visualization
- Climate and weather applications

WESTERN REGIONAL CLIMATE CENTER

DAS is home to the Western Regional Climate Center (WRCC), one of six regional centers across the United States supported by the National Oceanic and Atmospheric Administration.

CLIMATE INFORMATION SERVICES

- Archiving historical climate data and information for the western U.S.
- Disseminating high quality climate data and information
- Engaging in applied research related to climate issues and resource management
- Coordinating climate-related activities at state, regional, and national scales

CONTACT US

Naresh Kumar, Ph.D.
Executive Director, DAS
Desert Research Institute
2215 Raggio Parkway, Reno, NV 89512
(775) 674-7006
naresh.kumar@dri.edu



THE DESERT RESEARCH INSTITUTE IS PART OF THE NEVADA SYSTEM OF HIGHER EDUCATION.