THE AIRBORNE SYSTEMS TESTING AND ENVIRONMENTAL RESEARCH (ASTER) LAB at the Desert Research Institute conducts and facilitates the development and use of unmanned aircraft, payloads, and data analysis for a broad range of the environmental sciences.

The ASTER Lab has a fleet of fixed-wing and rotary-wing unmanned aircraft systems (UAS) that provide in-house capabilities to carry sensor payloads exceeding 6kg on an as-requested basis. ASTER’s payload inventory includes videography, radiometric long-wave (thermal) infrared, meteorology, airborne aerosol and gas measurement, and atmospheric sampling systems. Payload design and development occurs in-house, and the ASTER Lab also collaborates with other institutions to provide flight planning and airborne payload testing in specialized environments.

PAYLOADS

- Videography
- Radiometric long-wave (thermal) infrared
- Meteorology
- Airborne aerosol and gas measurement
- Atmospheric sampling systems
- L-band passive microwave radiometry
The Desert Research Institute (DRI) is a recognized world leader in basic and applied environmental research. Committed to scientific excellence and integrity, DRI faculty, students who work alongside them, and staff have developed scientific knowledge and innovative technologies in research projects around the globe. Since 1959, DRI’s research has advanced scientific knowledge on topics ranging from humans’ impact on the environment to the environment’s impact on humans. DRI’s impactful science and inspiring solutions support Nevada’s diverse economy, provide science-based educational opportunities, and inform policymakers, business leaders, and community members. With campuses in Las Vegas and Reno, DRI serves as the non-profit research arm of the Nevada System of Higher Education. For more information, please visit www.dri.edu.

**CAPABILITIES**

As a part of the FAA’s UAS test site network, the ASTER Lab is able to conduct and oversee flight operations at and above 365m (1200 feet) altitude, at night, and beyond the visual line of sight of the pilot with appropriate arrangements. For operations without complex flight profiles, the ASTER also conducts flights under authorization of FAA’s part 107 rules with FAA-certified and insured uas pilots. ASTER conducts flights under rigorous safety protocols established in collaboration with FAA to represent the highest standard in unmanned aviation safety.

Our innovative payload development programs and collaborative approach to interdisciplinary science puts us at the forefront of drone-based environmental sensing. For example, our fire science payloads allow for simultaneous fire monitoring, fuels and soil moisture sensing, and smoke sampling for both particulate matter and trace gas concentrations, including laboratory analysis of particulate chemistry. We partner with fire science experts to deploy our drones and sensors at active controlled burns and to characterize the post-wildfire environment.

**WORKING TO SOLVE OUR MOST CHALLENGING ENVIRONMENTAL PROBLEMS**

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