Desert Research Institute






Opportunities in Nevada for UAS Testing

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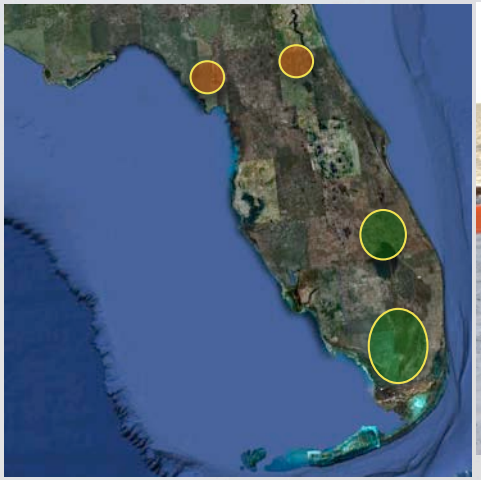
NASA-Ames Research Center, 29 April 2014

NASA-USFS Tactical Fire Remote Sensing Advisory Committee


“There must be a better way…”




Gators

Overview

-Intro, DRI experiences/interest in UAS

-UAS-Fire Concept

-Nevada's Test Site

-Airspace update, institutional dross

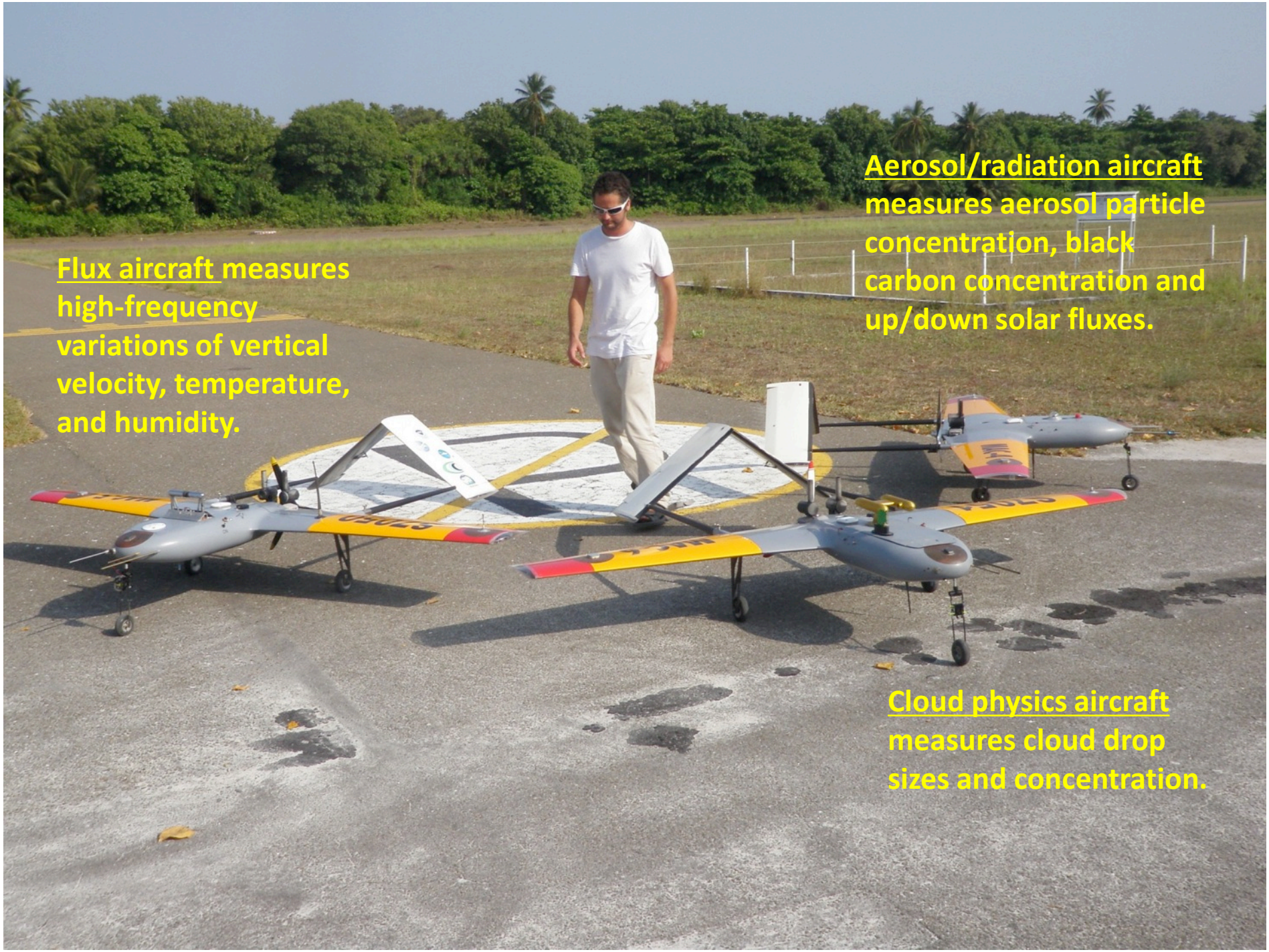
-Discussion

DRI: Research Institution of the Nevada System of Higher Education

- Founded 1959
- 2 campuses: Reno and Las Vegas
- ~559 employees, about 155 faculty
- About 300 projects on 7 continents
- All faculty are soft-money

Moisture dynamics in the cloudy and polluted tropical atmosphere: The Cloud Aerosol Radiative Forcing Dynamics Experiment (CARDEX)

Eric Wilcox, Desert Research Institute, eric.wilcox@dri.edu, 775-673-7686
Rick Thomas, P. S. Praveen, Kristina Pistone, V. Ramanathan, Lynne Russell, Scripps/UCSD
Frida Bender, Örjan Gustaffson , Stockholm University
Yan Feng, Argonne National Laboratory
Nic Beres, Hans Moosmüller, Rajan Chakrabarty, Desert Research Institute
Julia Remmers, Steffen Doener, Max Planck Institute, Mainz

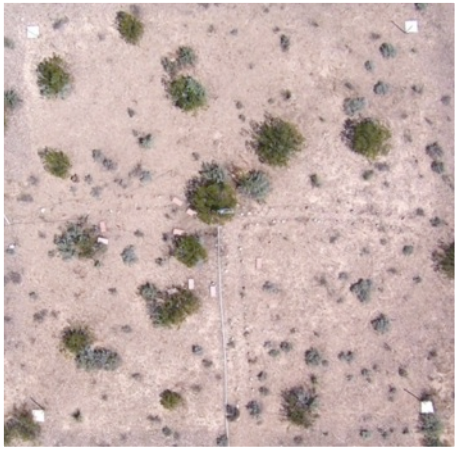

Aerosol/radiation aircraft measures aerosol particle concentration, black carbon concentration and up/down solar fluxes.
Flux aircraft measures high-frequency variations of vertical velocity, temperature, and humidity.
Cloud physics aircraft measures cloud drop sizes and concentration.

Assessing Climate Change Treatment Effects with a Radio Control Helicopter Multispectral Platform

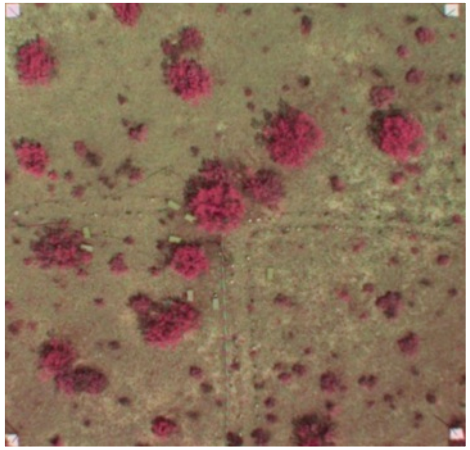
Dr. Lynn Fenstermaker, Desert Research Institute
Eric Knight, University of Nevada, Las Vegas

UAS Platform: Class I helicopter, 55.7” length

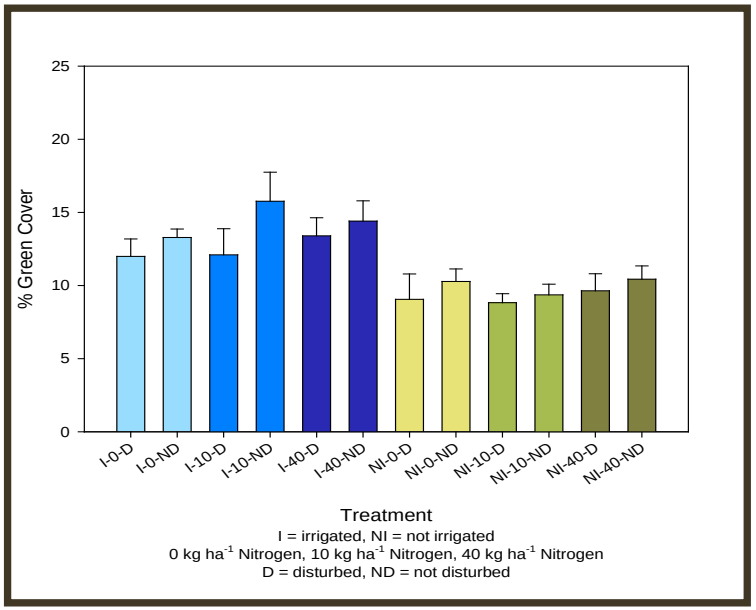
Sensor Package: Tetracam multispectral camera simulating green, red and NIR Landsat bands and real time altimeter with engine and battery monitoring



Standard color digital photo

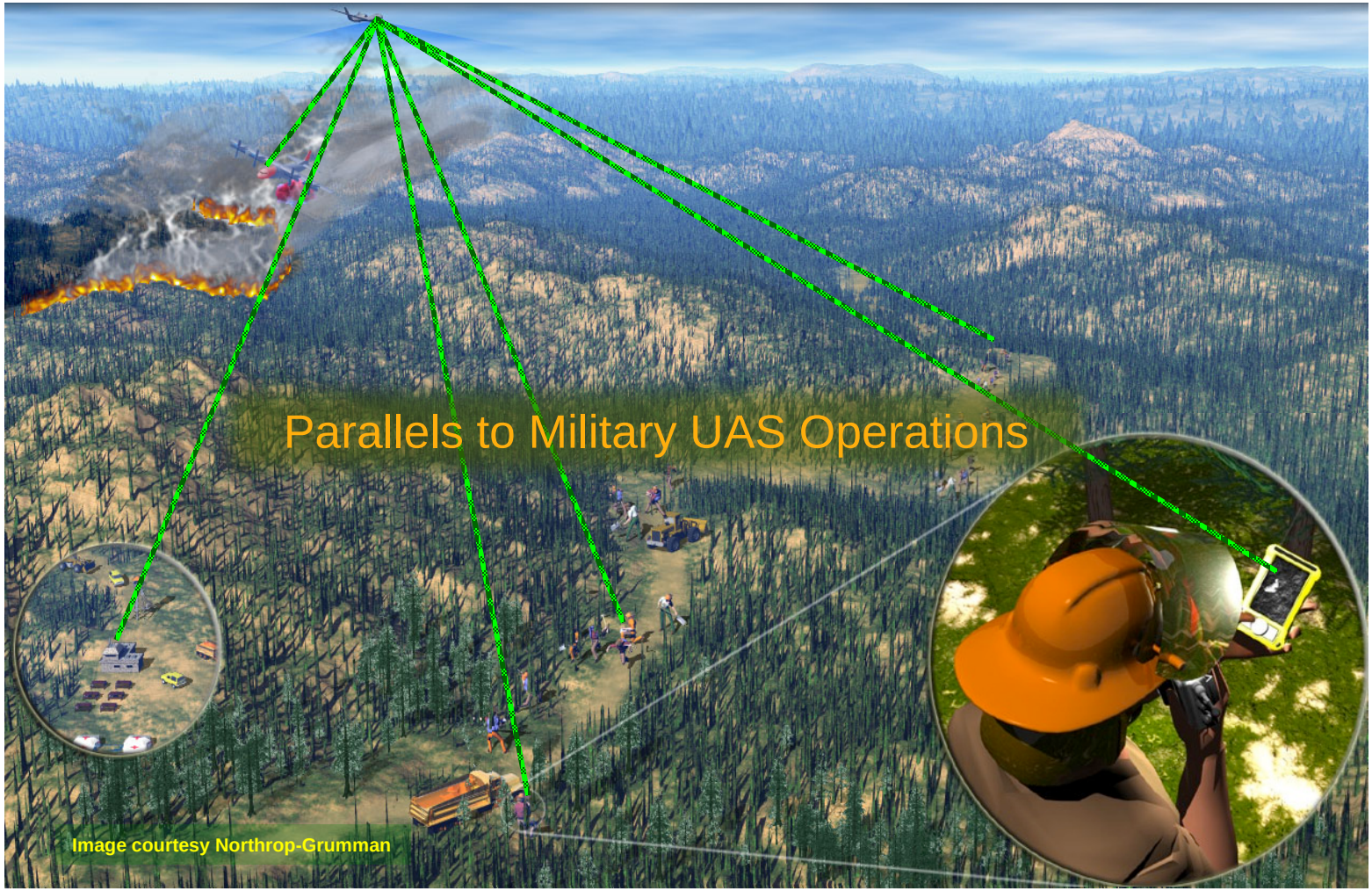


Multispectral CIR photo



Climate Treatment Effects on Plant Cover

Fire-related applications: Natural progression of military UAS technology



Fireball-NASA-DRI… collaboration

Other UAS Applications of Interest:

- Reclamation/Restoration Monitoring
- Wildlife Surveys
- Habitat Assessments
- Forestry Stand Analysis

- Cumulative Permit Impacts
- Biomass Estimates
- Land Use Sampling
- Utility Line Surveys
- Vegetation Monitoring
- Post-disaster damage surveys

Landscape Ecology:
- Patterned landscapes
- Microclimate and conservation
- Ecohydrology and feedbacks
- Management

Nevada FAA UAS Test Site Update

April 2014

Don Cunningham
NIAS UAS PMO, Business Operations Manager

Introduction

- Mid-2013: Nevada established the Nevada Institute for Autonomous Systems (NIAS), the Program Management Office (PMO) was staffed with Subject Matter Experts to operate and manage the Nevada UAS Test Site
- Primary purpose was to develop a Master Document Library of standard, repeatable processes for operation of the Test Site to facilitate the immediate start of flight operations upon designation
- The Nevada UAS Test Site is open for business and is conducting flight operations of previously planned UAS projects while planning multiple other efforts in support of the FAA UAS Test Site program

Activity Plan

Following designation on 30 December 2013, the PMO developed the Annual Activity Plan which stressed the work objectives for this year

- UAS Standards and Operations
  - Next-Gen based Detect and Avoid (DAA using Robust ADS-B)
  - Develop standards for Aircrew/Maintainers/Dispatchers/Controllers
  - Develop training for Aircrew/Maintainers/Dispatchers/Controllers
  - Redundancy/Security of UAS Data-links and Navigation
  - Cooperative alternate test location for other FAA Sites (Sense and Avoid, Command & Control or other research domains)
- Operator Standards and Certification
  - Rural Development of Civil Operations (Routine small UAS VLOS)
  - Development of Standardized Procedures (TERPS/Airports)
  - Standardize Commercial UAS Data-link (Redundancy/Security/Navigation)
- Protection of Privacy *(Operator Certification)*
  - Cyber-security of UAS Data-links
  - Proactive Community Involvement (transparent and open access)

Post-Designation Efforts

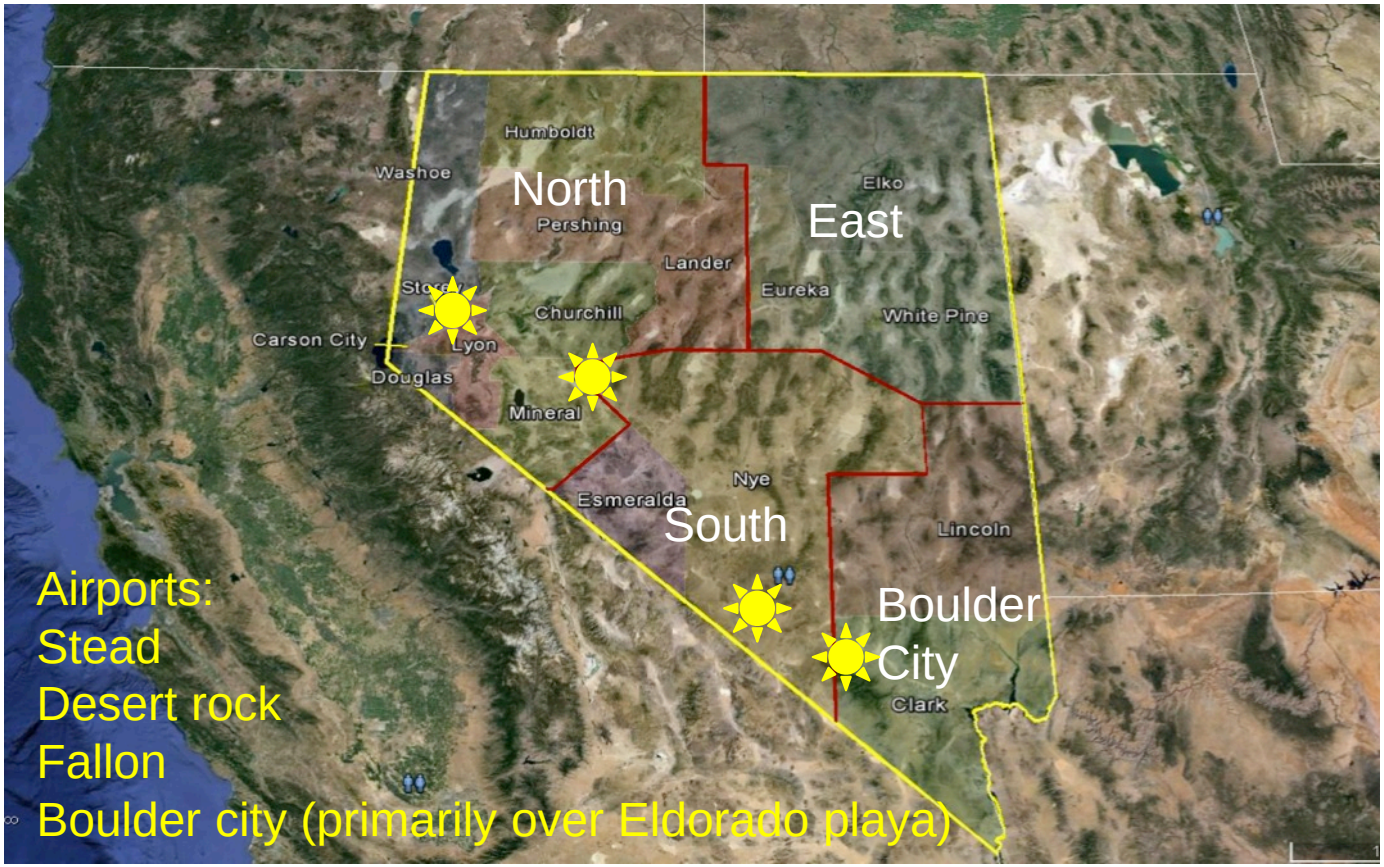
- Focus on:
  - Revisions in Test Site construct based on follow-on meetings
  - Immediate COA applications for flight operations and customer operations at NNSS and NV-65 (Desert Rock Airfield)
  - Planning for other client UAS flight operations
  - Vendor registrations
  - Infrastructure improvements
  - Operating location expansion via the rural airport outreach
  - Flight operations procedures revision and development for additional locations
  - Integration of technologies
  - Assessments and studies and reports of results

UAS Flight Operations—Nevada UAS Test Site

- Certificate of Waiver or Authorization (COA)
  - Public aircraft may be flown using a COA
- Special Airworthiness Certificate (SAC)
  - Civil aircraft may be flown using a SAC or Special Flight Permit
- Special Use Airspace – a Nevada advantage
  - Does not require a COA or SAC but scheduling/price is challenging
  - Nevada can conduct operations at the Nevada National Security Site under the Department of Energy Work For Others program
  - Parts of the Nellis Test and Training Range may be used on a scheduled, non-interference basis since the NTTR is a Major Range and Test Facility Base (MRTFB)

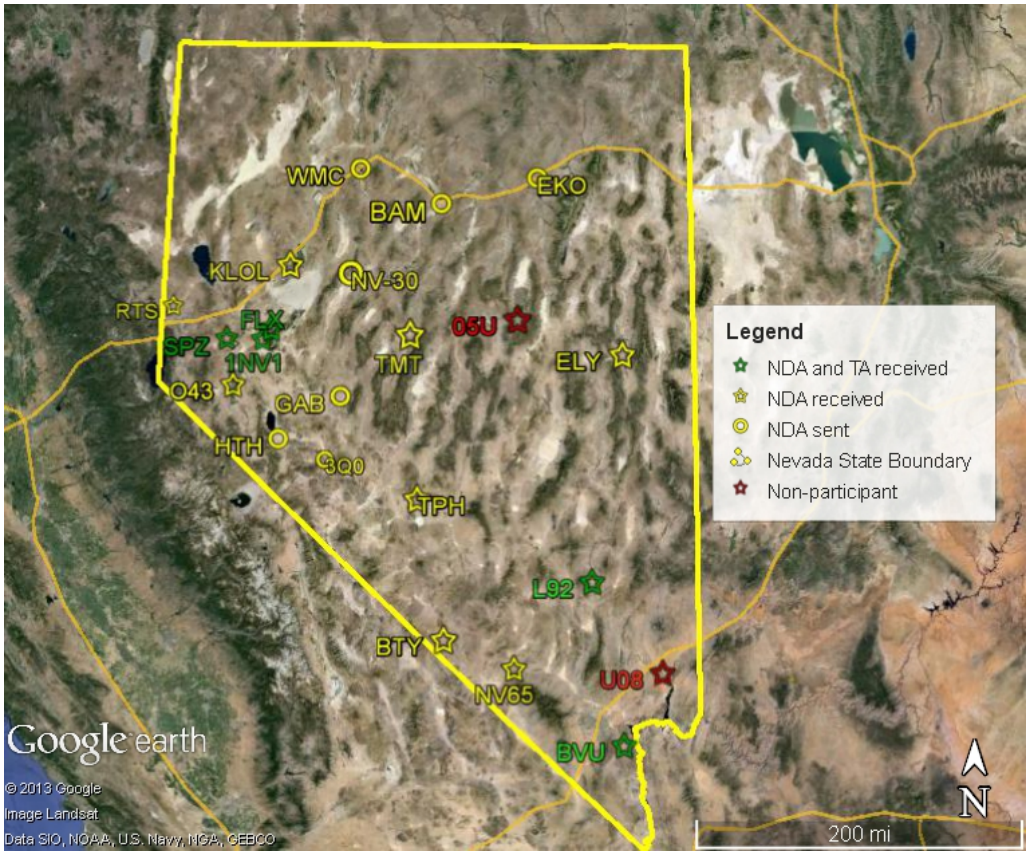
*NASA MoU/MoA with FAA…

Range Testing Network



Added Eastern Range sector following designation to accommodate addition of rural airport outreach expansion of Test Site construct

Test Site Expansion



- To date, 41 rural airports have been contacted and 39 are interested in being included as Operating Locations.

Update: Northern NV UAS Economic Development Collaborative

- Northern NV has new PMO-FAA liaison: Warren “Bum” Rapp
- All Test Sites complain about FAA being slow
- Unnamed company has received commercial COA (UUAS?)
- UNR developing curricula for UAS coursework, minor

Discussion, questions?

-Mechanisms of Collaboration with DRI/NSHE

-Space Act Agreement

-Possible fire-UAS pilot project in FY14

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