



**Savannah River  
National Laboratory™**

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# small - Unmanned Aircraft System (sUAS) Program Update Savannah River National Laboratory

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# Program Objectives and Overview



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# UAS Program Objectives

- 1) Serve Ourselves (SRS)
- 2) Serve Research and Development for Other Customers
- 3) Serve Our Community (Emergency Response)



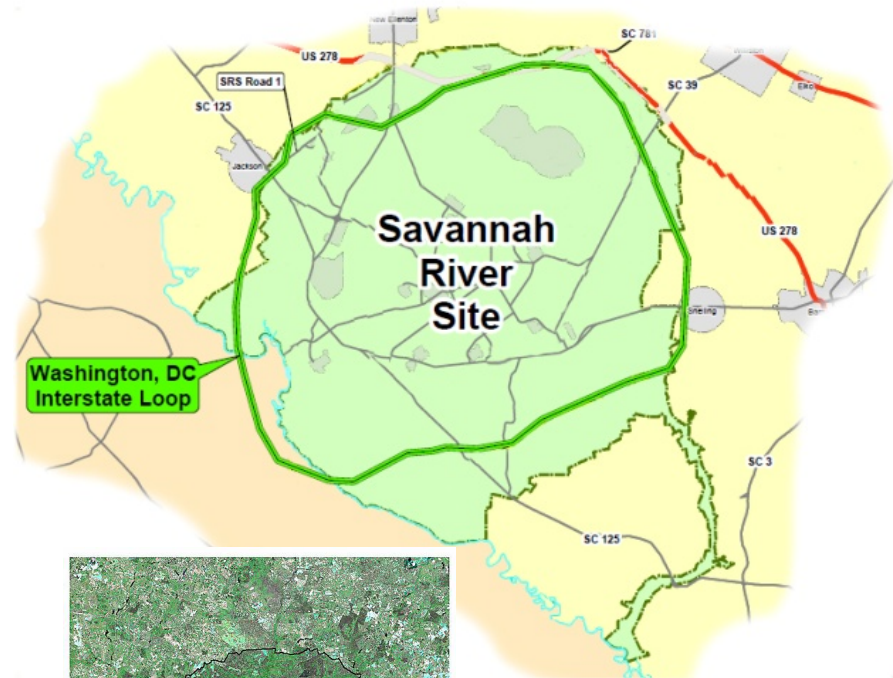
# UAS Program History

March 2017	Proposed idea to DOR-SR
May 2017	First Draft of Aviation Implementation Plan
December 2017	First Joint Operation with Defense Threat Reduction Agency and Virginia Tech (Gunsite 51)
January 2018	Joint DTRA/VT Operation
February 2018	FBI Post Blast Scene Survey
April 2018	L Area Inspection
July 2018	Basic Ordering Agreement (BOA) with VT approved
August 2018	P Area Gas Collection P and R Area Survey 717-F Duct Survey
September 2018	R Area Herbicide Spraying
January-Oct 2019	P Area Ash Basin Remediation Construction Progress
February 2019	DWPF Emergency Response Drill
April 2019	K Area Roof Inspection DTRA Hyperion Horntail UAS Rodeo/Capstone Project



# What makes SRS attractive for UAS activities?

- Limited access site capable of conducting sensitive operations in an access controlled environment.
- Large land mass (approximately 310 square miles) with a variety of location options for activities
- Approximately 17 NM diameter
- Approximately the size of the land mass circumscribed by the I-495 beltway around DC.
- Variety of terrains ranging from swamp to woodland to open fields to large lakes. Operational railroad and 600+ miles roads.



# SRS Overview

Applied Research Center  
(off-site)

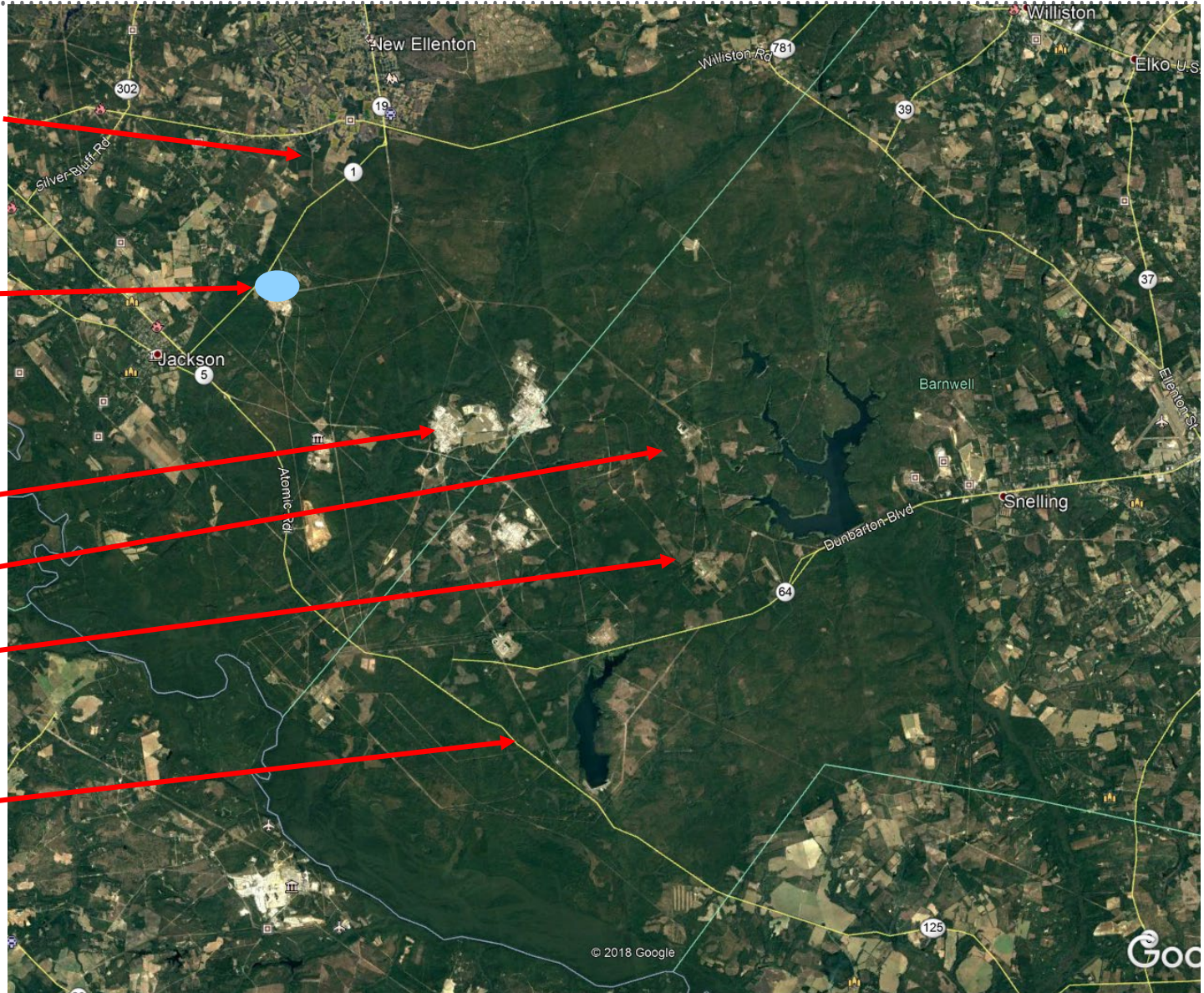
SRNL

F Area

R Area

P Area

Gunsite 51



# Airspace and Aviation Characteristics

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Airspace: Class G

DOE Blanket Certificate of Authorization: 2017-AHQ-901-COA

14 CFR Part 107 Certification Required for PIC

Visual Observer Required

FAA Reportable: All 14 CFR 107 requirements plus:  
any damage to AC requiring repair prior to flight

Night-time flight operations permitted

No operations within 2 miles of SRS helipad

1200 ft ceiling permitted

Continuous and unaided line-of-site required

Flight Ops Areas Proximity:

13 NM from nearest airport with operating control tower

8.5 NM from nearest airport with published instrument approach



# SRS Ground Support

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- SRS and Local Meteorological Support
- Remote Worker Accountability
- SRS Visitor Badging
- ICOM Navigation Air Band Radios
- Motorola Astro Radios (SRSOC)
  - *Airboss comms*
- Garmin Pilot
- ADS-B (in)
- Mobile Command Post Operations
  - *Site Operations*
  - *Remote Viewing*
  - *Meteorological Data*
- Portable Generators
- Portable Toilets where needed
- Tents/Chairs





# Aircraft Inventory

Four Typhoon H small UAS hexacopters

4K gimbal camera

Light Lift hexacopter

LIDAR, Camera, Gas Sampler  
6 lb useful load

Heavy Lift hexacopter

LIDAR, gimbal FLIR Camera,  
12 lb useful load  
Sprayer



~7" rotors



53" wing span



86" wing span



# SRNL Applied Research Center Training/Testing Area

Shelter Area

Restrooms

Vending machines

No security escort

Closest airport:  
13.2 NM



SRNL Applied Research Center  
And UAS Training/Testing Area



# 400 Area Training Area

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Large, open area

Concrete supports

Roadways

Open fields

Portable toilets

Cell Coverage

Unoccupied

Closest airport: 15.2 NM



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# P Area Research and Testing Area

Large Open Area

No obstructions

Cell coverage

Portable toilets

No shelter area

Closest Airport: 9.4 NM



# Gunsite 51: Post Blast Training Area

4 large concrete pads

Transferrable Rad  
Contamination approved

Smaller open area

Cell Phone Coverage

Portable toilets

No shelter area

Closest airport: 14.2 NM



# P-Area, Dunbarton Bay Ash Basin Remediation

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Site Maintenance and Compliance Support: Field Inspection of remediation project

- Aerial inspection provided by Hexacopter captures high resolution media of in-situ remediation activities throughout the construction phase of work.

1/31/2019 – Pre-construction



3/6/2019 – Remediation began in February



# R-Area Herbicide Spraying

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Closed Waste Site Maintenance: Prevention of woody vegetation at closed waste site

- As a result of the previously mentioned inspection, woody vegetation was identified.
- Heavy Lift Hexacopter provided herbicide treatment to prevent woody vegetative growth on top of in-situ decommissioned reactor complex.
- Maintenance item supports LUCIP criteria to ensure integrity of in-situ decommissioned reactor complex.



# F-Area Duct Inspection

Use of a UAS for building inspections gives access/view to areas unsafe and/or inaccessible for humans

Inspection of 717-F rooftop and outside ductwork – August 2018

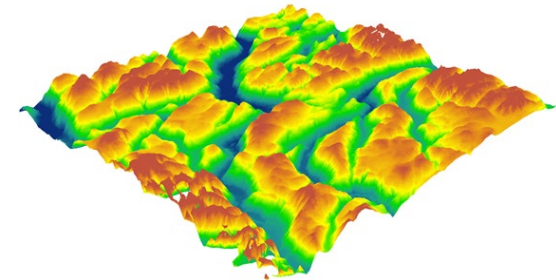
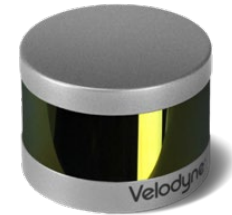




# Future Plans

## LIDAR via UAS

- Currently
  - Over 700 acres of engineered cover systems monitored
  - Most have no quantitative data post installment
- LIDAR
  - Captures changes in elevations using pulsed light
  - Creates digital elevation maps
  - Accurate +/- 2cm
- UAS
  - Provides the ability to rapidly mobilize
  - Safely fly and record data for both visual inspection and record quantitative data
  - Ability to pre-program flight paths
  - Cost effective



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# Questions?

