

UAS BACKGROUND AND CAPABILITIES OVERVIEW

PCoP WEBINAR SERIES

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Jacksonville District
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On behalf of HQ USACE Aviation



US Army Corps
of Engineers®





PURPOSE/TOPICS



ASK YOURSELF:

1. Is it good for my customer?
2. Is it legal and ethical?
3. Is it something I am willing to be accountable for?

If so, don't ask permission, you already have it.



LTG Flowers
Chief of Engineers 2000-2004

Purpose:
USACE uses UAS for a variety of purposes as a force multiplier to accomplish its mission.

Topics:

- Introduction
- UAS Background
- UAS Applications
- Requirements
- Summary



THANKS...



THANKS to the “Team of Teams”



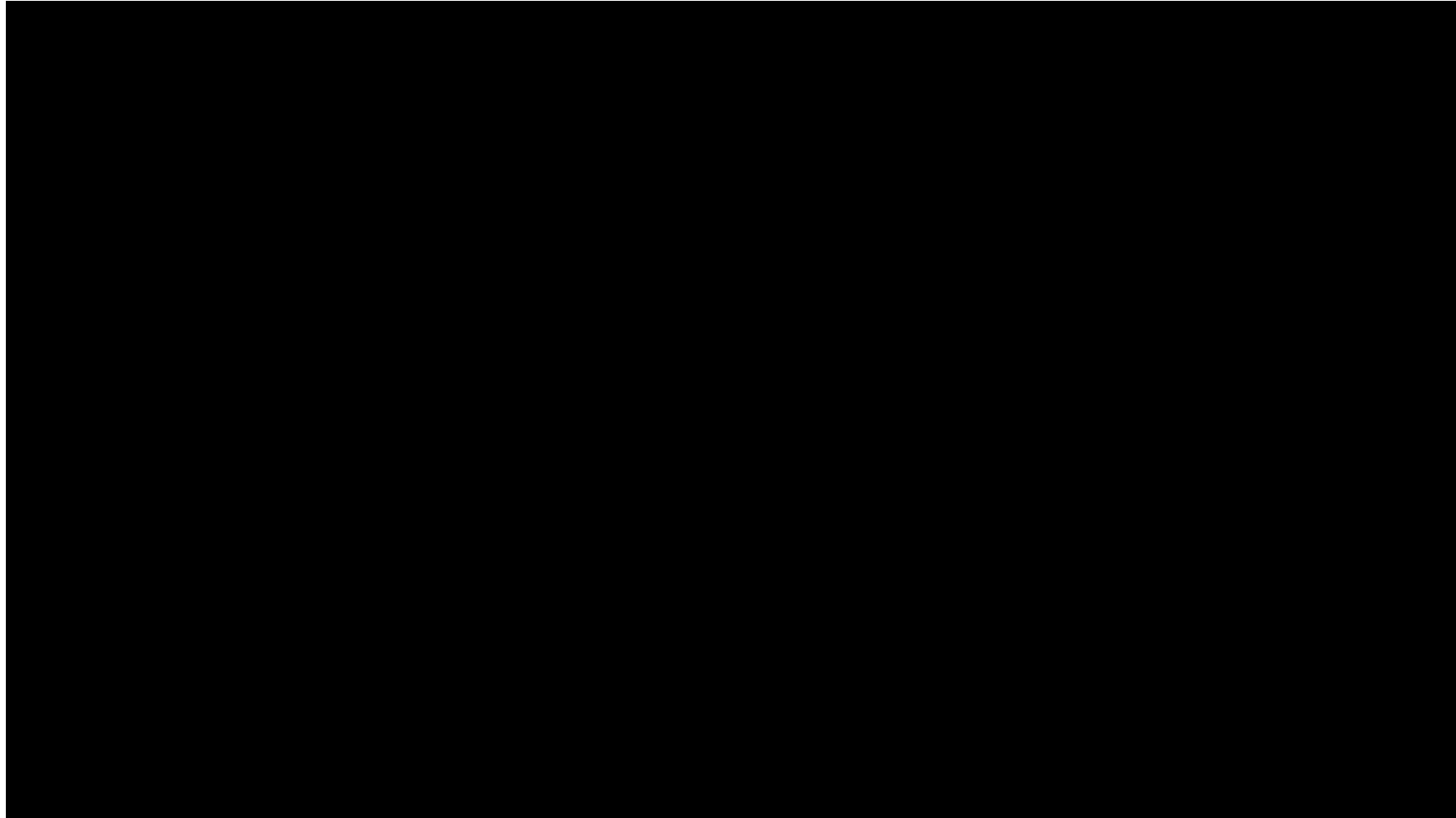
BOTTOM LINE UP FRONT



- *USACE uses UAS as a force multiplier for various mission sets.*
- *USACE is reorganizing its UAS formations into an Enterprise Aviation program*
- *USACE UAS operators will be focused on operations while regulatory burdens are handled at the highest echelon*



VIDEO (HOPEFULLY)










UAS BACKGROUND



UAS GROUPS



UAS Groups	Maximum Weight (lbs) (MGTOW)	Normal Operating Altitude (ft)	Speed (kts)	Representative UAS	
Group 1	0 – 20	<1200 AGL	100	Raven (RQ-11), WASP	
Group 2	21 – 55	<3500 AGL	< 250	ScanEagle	
Group 3	< 1320	< FL 180		Shadow (RQ-7B), Tier II / STUAS	
Group 4	>1320	< FL 180	Any Airspeed	Fire Scout (MQ-8B, RQ-8B), Predator (MQ-1A/B), Sky Warrior ERMP (MQ-1C)	
Group 5		> FL 180		Reaper (MQ-9A), Global Hawk (RQ-4), BAMS (RQ-4N)	

From DOD 2011 UAS Airspace Integration Plan D-3



ACCESS PROFILE



	ACCESS PROFILES	OPERATIONAL MISSIONS	TRAINING MISSIONS	SUPPORT MISSIONS
Visual Line of Sight		<ul style="list-style-type: none">Tactical surveillance & reconnaissanceDisaster relief-DSCA	<ul style="list-style-type: none">Pilot/Operator qualification proficiencyCombat readiness	<ul style="list-style-type: none">Development & testMaintenance & checkout
Terminal Area		<ul style="list-style-type: none">Local security (e.g. event & emergency)	<ul style="list-style-type: none">Take off / landing proficiencyOrbit proficiencyCheck-flights	<ul style="list-style-type: none">Development & testMaintenance & checkout
Operating Areas		<ul style="list-style-type: none">Local security (e.g. event & emergency)	<ul style="list-style-type: none">Orbit proficiencyIFR Qualification & proficiencyCombat readinessCheck-flights	<ul style="list-style-type: none">Development & testMaintenance & checkout
Lateral Transit		<ul style="list-style-type: none">Convoy & roadway securityBorder patrolDeployment	<ul style="list-style-type: none">Transit to training airspaceTraining for convoy/roadway	<ul style="list-style-type: none">Development & testFerry (e.g. contractor to test facility)
Vertical Transit		<ul style="list-style-type: none">Transit to Class A controlled airspace for all operational missions	<ul style="list-style-type: none">IFR Qualification & proficiencyCombat readinessOrbit operations	<ul style="list-style-type: none">Development & testFerry
Dynamic		<ul style="list-style-type: none">All operational missions	<ul style="list-style-type: none">All training missions	<ul style="list-style-type: none">All support missions

From DOD 2011 UAS Airspace Integration, table 1.



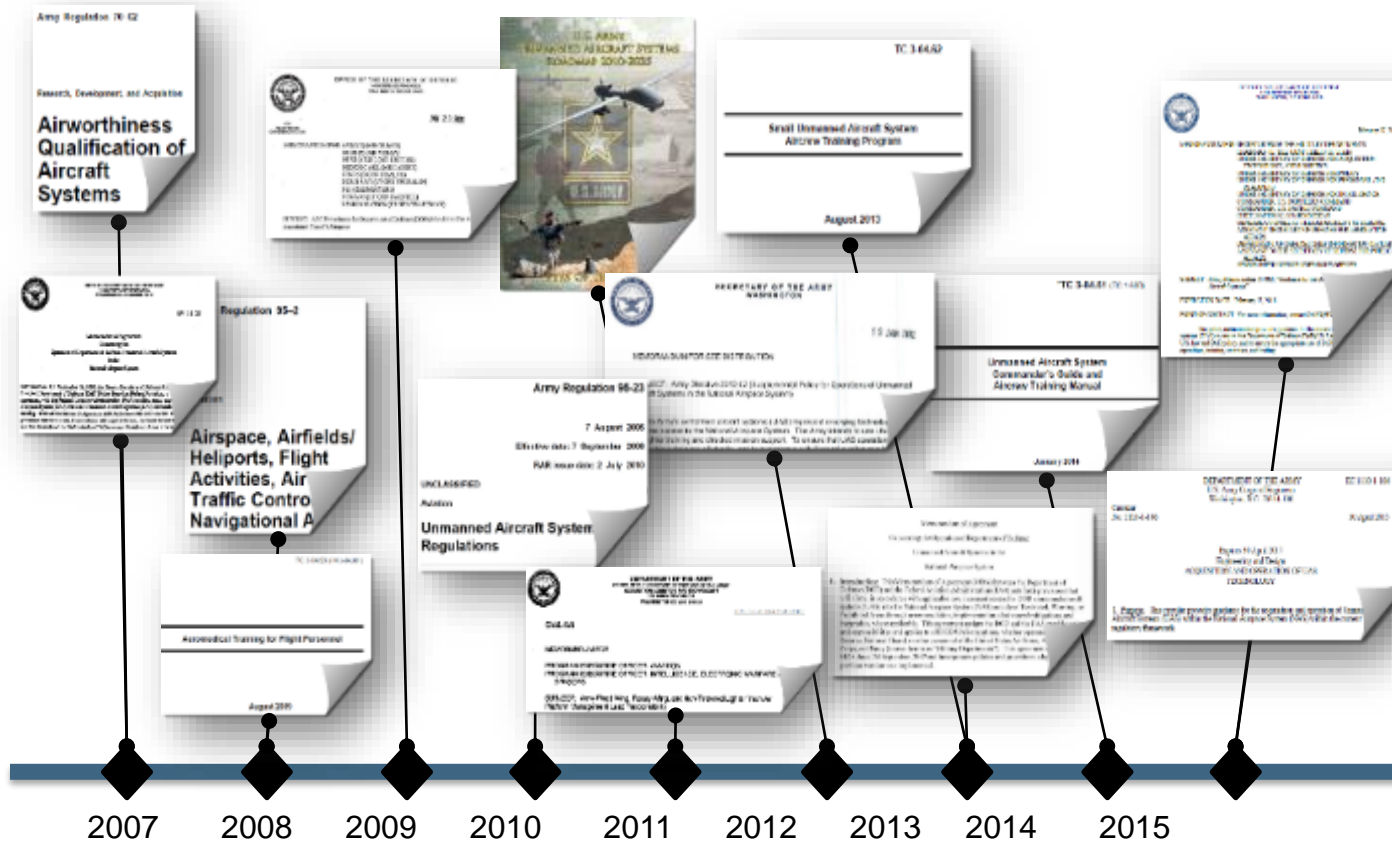
Regulation Challenges



- USACE is a Direct Reporting Unit within the Army
- Covered by DOD and Army Regulations
- Primarily a “civilian” mission; however, warfighter support is a high(est) priority.



REGULATION, POLICY, AND GUIDANCE





WIIN ACT SECTION 1124



...designate an individual, within the headquarters office of the Corps of Engineers, who shall serve as the coordinator and principal approving official for developing the process and procedures by which the Corps of Engineers

...shall be exempt from regulations of the Department of Defense, including the Department of the Army, governing such system.

Implementation guidance forthcoming...





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UAS APPLICATIONS



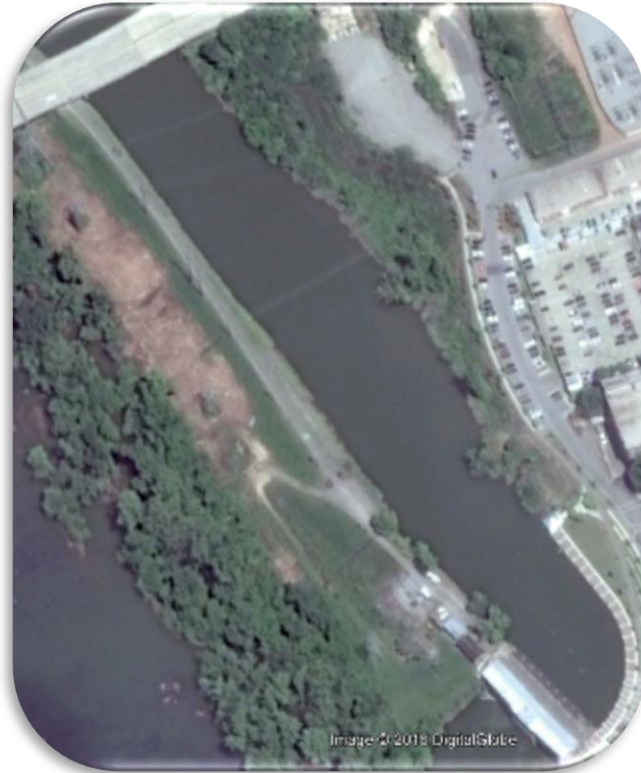
Applications



- Pre/active/post construction monitoring
- Asset/infrastructure management
- Environmental restoration/compliance
- Invasive species surveillance and reconnaissance
- Digital Surface Models



Emergency Response Case Study For Tropical Storm Joaquin



Columbia Canal 201504
-Google Earth



Columbia Canal 20151011
-SAJ Mosaic

Case Study for Emergency Response



-Columbia Canal 20151011
~1600



-Columbia Canal 20161012
~1000

-Mosaic creation completed ~3 hours after data acquisition

-Absolute spatial accuracy > ~3 meters with no ground control



Post Storm Dam Assessment



-Debris remnants from Katherine Dam overtopping



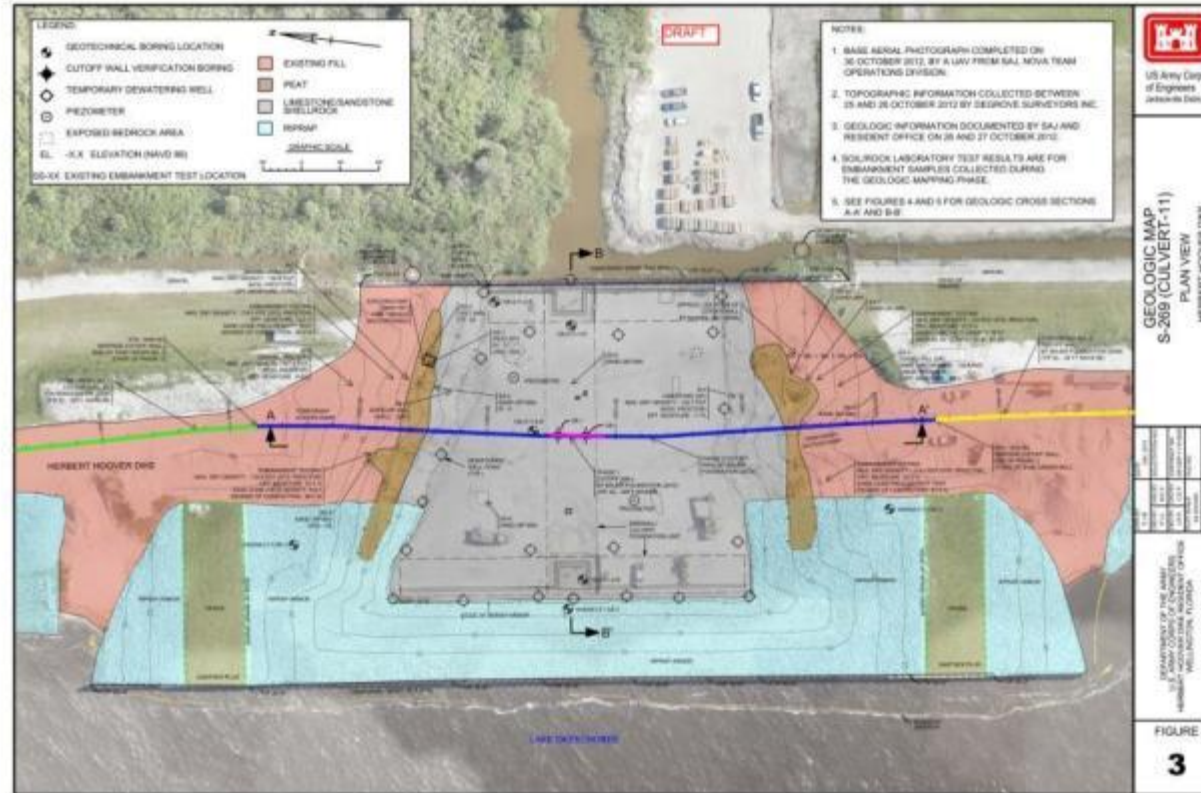
-Construction at Beaver Dam

Detailed Construction Monitoring



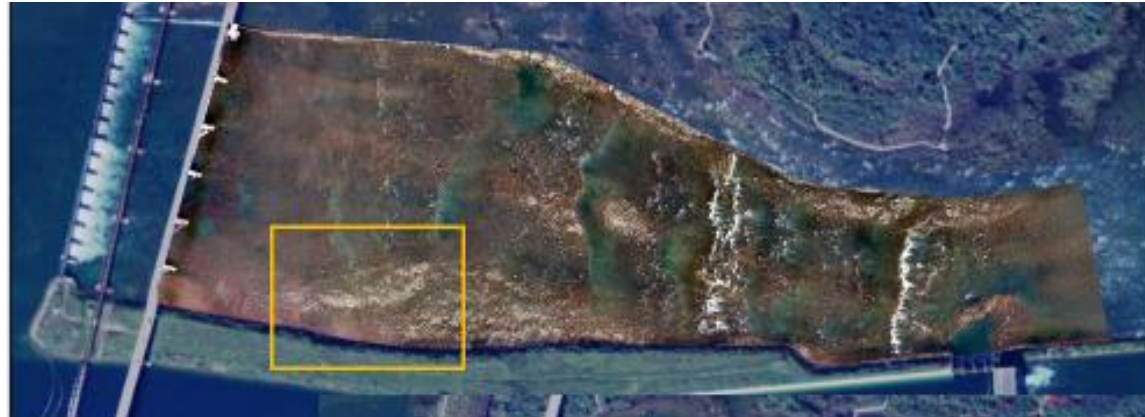
Construction surveillance and documentation

Detailed Construction Monitoring

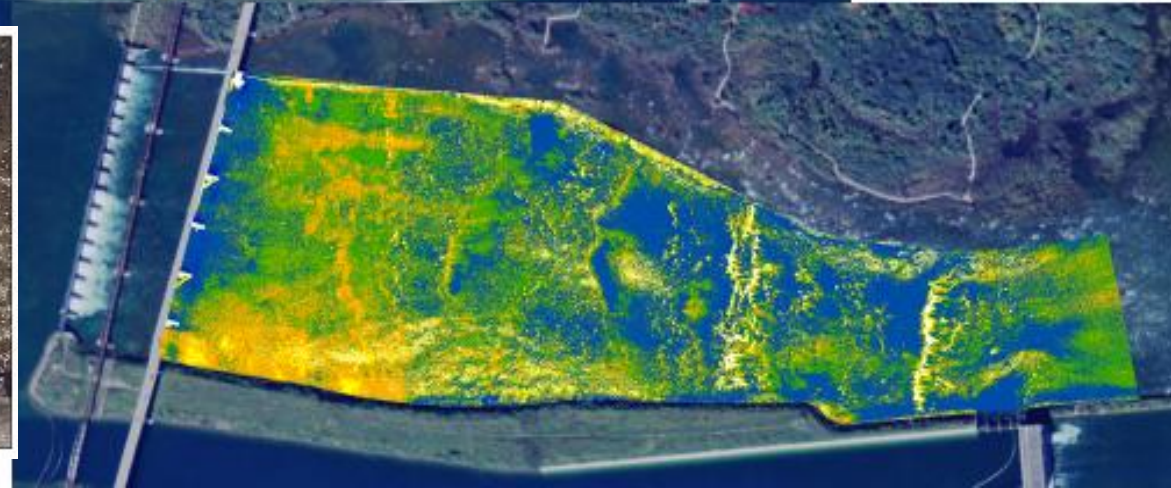


Geological foundation mapping for culvert replacement

SAFER HABITAT MAPPING



Preliminary
Analysis of
Rapids
Habitat



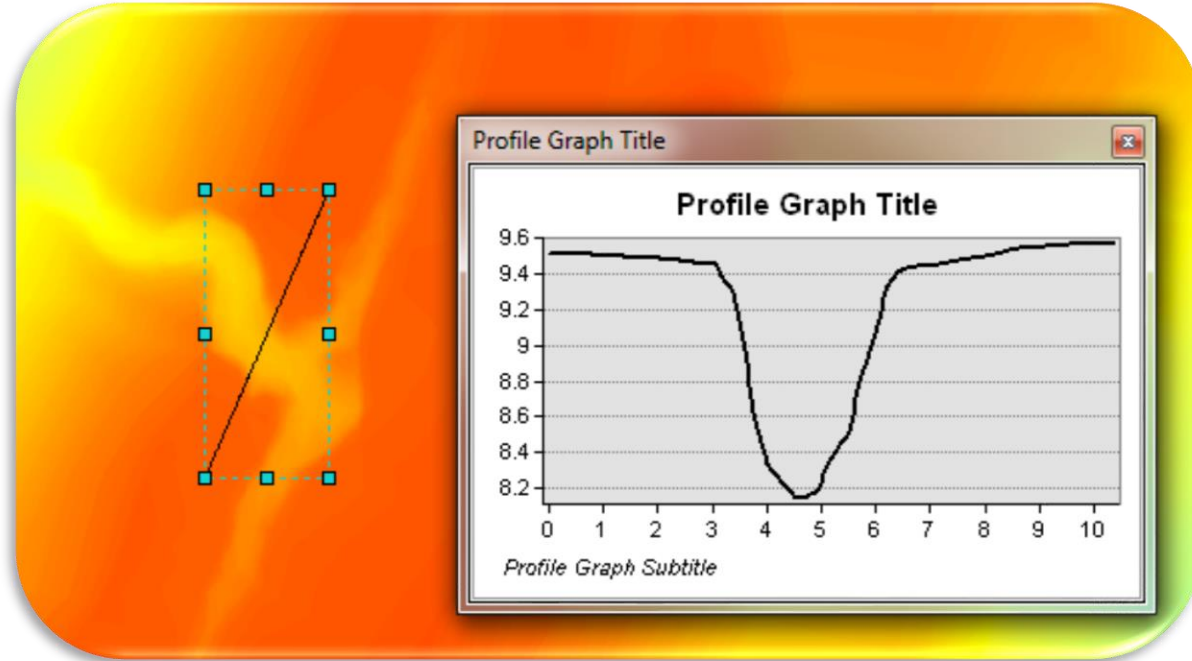
Soo Locks, Sault St. Marie, Michigan, December 2016

Remote habitat mapping reduces risk exposure
for personnel



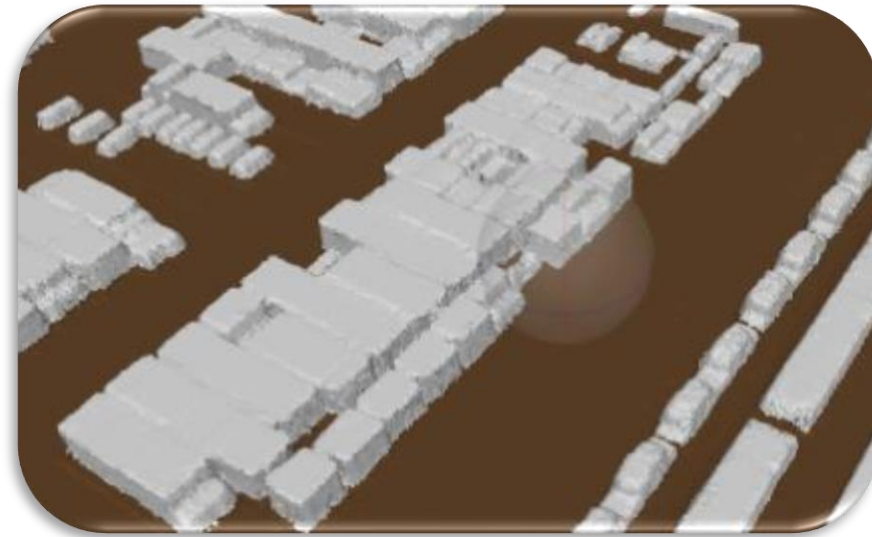
WATCH YOUR STEP...

SJ1 Upland Disposal Area, St. Augustine, Florida



- ~1.2 meter washout
- Rapid assessment of road/levee conditions

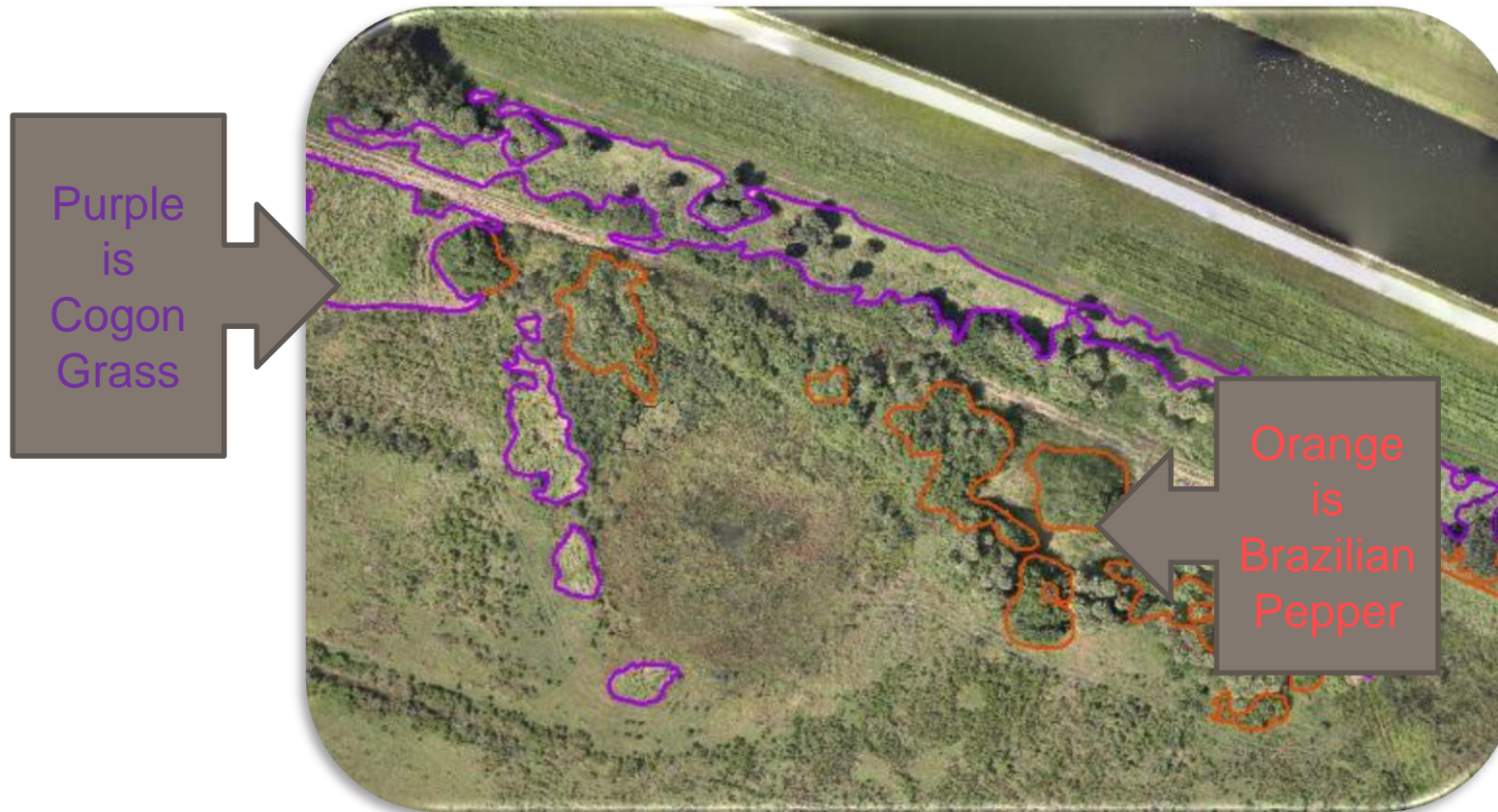
POINT CLOUDS WITH RGB VALUES



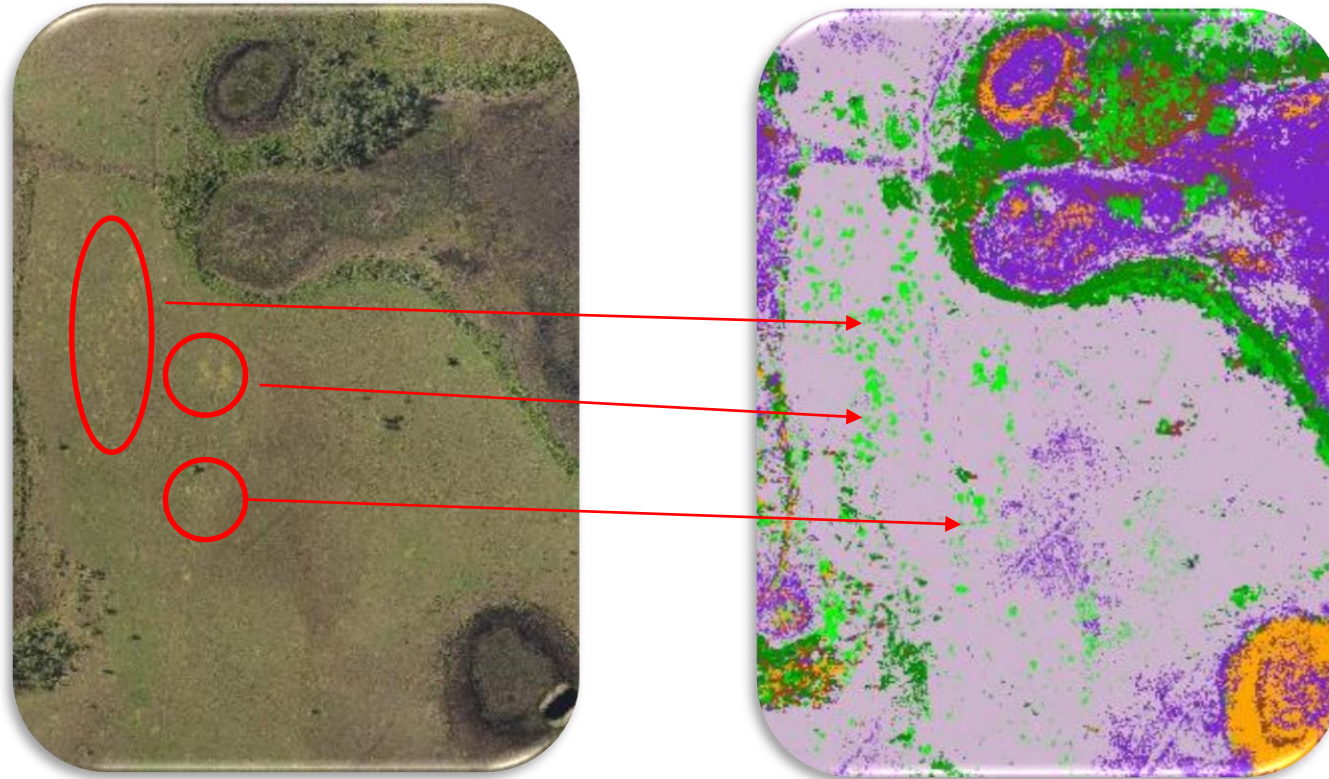
- RGB point clouds can be used to create three dimensional visualizations
- BE model can segregate storm debris for volume estimates

Species Identification

- Resolution sufficient to identify structural properties of plants



Species Identification/Classification



Species delineation near Lake Placid Florida, ~2014

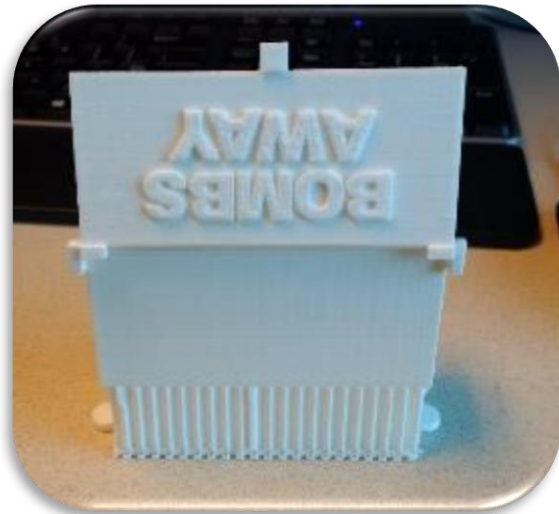
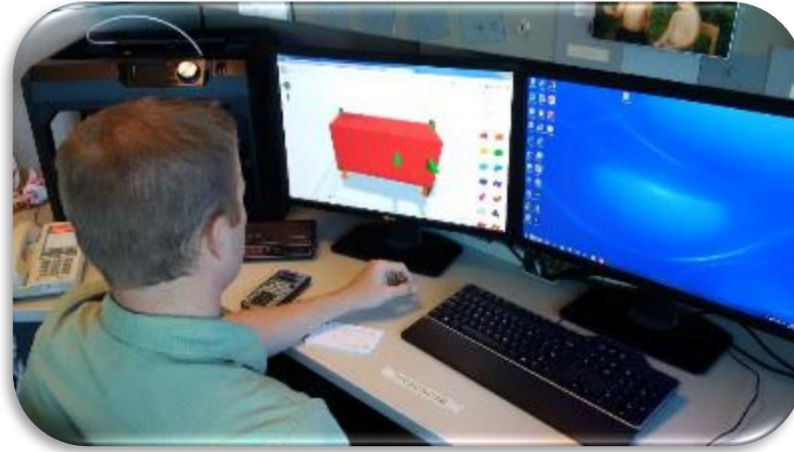
- Maximum Likelihood Classification based on spectral properties of RGB mosaic.



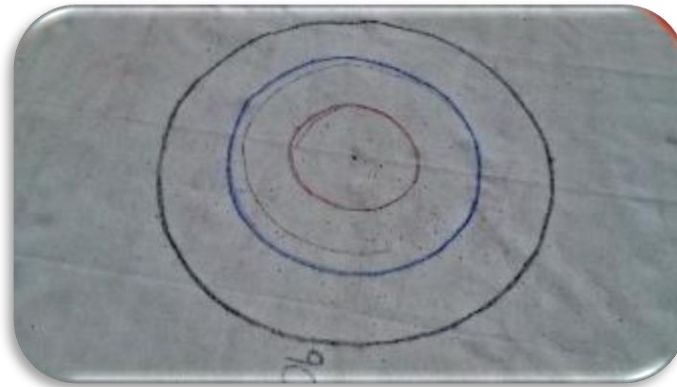
BIOCONTROL RELEASES



BIOCONTROL RELEASE GEN 1 DESIGN



BIOCONTROL RELEASE GEN 1 TESTING





REQUIREMENTS



REQUIREMENTS – GETTING STARTED



- Designate ATPM
- Train Personnel
- Acquire System (Through HQ Aviation)
- Fly

**AVIATION PROGRAM OFFICE HELPS EVERY
STEP OF THE WAY**



THE STARTUP TEAM LOOKS LIKE...



- Additional Duties – No New FTE or PD Changes
 - Less Than 10% for ATPM
 - There is NO Need for New FTE. Ever.
- Normally 3 People – ATPM, 2 Pilots
- Team Should Reside Close to the Work



TRAINING

- FAA Part 107 Training = Minimum Standard
 - ERDC Graduate Institute
 - Or Other FAA Part 107 training
- USACE Indoctrination Training
- System Specific Training



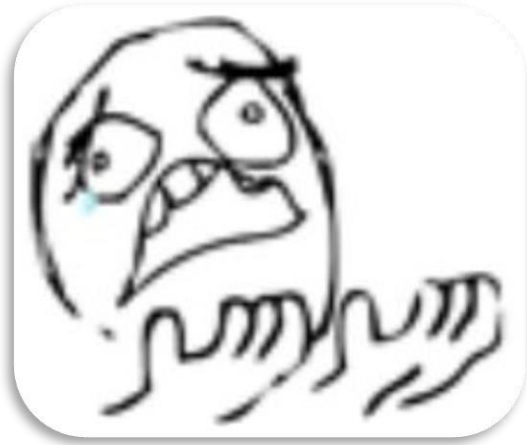
ASSISTANCE

- Program Initiation
- Mission Planning and Execution
- General Questions from Field

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HQAviation@usace.army.mil



Parting Thoughts...



- THANK YOU for listening.
- Flying UAVs is fun value added
- Let's “move some dirt...”



LET'S TALK MORE



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904-232-2465

Consider signing up for the SAJ UAS
Newsletter

Our website:

<http://www.saj.usace.army.mil/Missions/UnmannedAerialVehicle.aspx>

Questions?

Type questions in the chat box.
We will answer as many
as time allows.

This webinar will be posted to the
Planning Community Toolbox:
<http://www.corpsplanning.us>



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