Deploying Drones for Improved Environmental Results

E-Enterprise for the Environment
EE2020 Webinar
December 17, 2020

Welcome!
We will get started shortly.

If you have any technical issues, please use the Q&A tool to alert us.
Please note that you are muted.

Why UAVs/Drones

- ECOS' annual State Innovation Awards highlight new approaches to environmental protection. Unmanned aircraft vehicles (UAV)/drones have emerged as an important tool to broaden agency capabilities.
- In August 2016, the Federal Aviation Administration (FAA), 14 CFR Part 107 rules went into effect for both civil and public use of drones. This has led to increased drone use.
- The Part 107 rule requires line-of-sight, under 55 pounds, daylight use, less than 100MPH, and below 400 feet.
- In addition to images and video footage, drones are being used for hazardous air and water pollution sampling, sampling and measuring pool depths, and to deploy other specialized cameras such as multispectral cameras (enables a single camera sensor to work like many cameras in combination), thermal (temperature sensing), or Forward Looking Infrared (FLIR) cameras (to detect liquid volume in tanks or gas leaks)

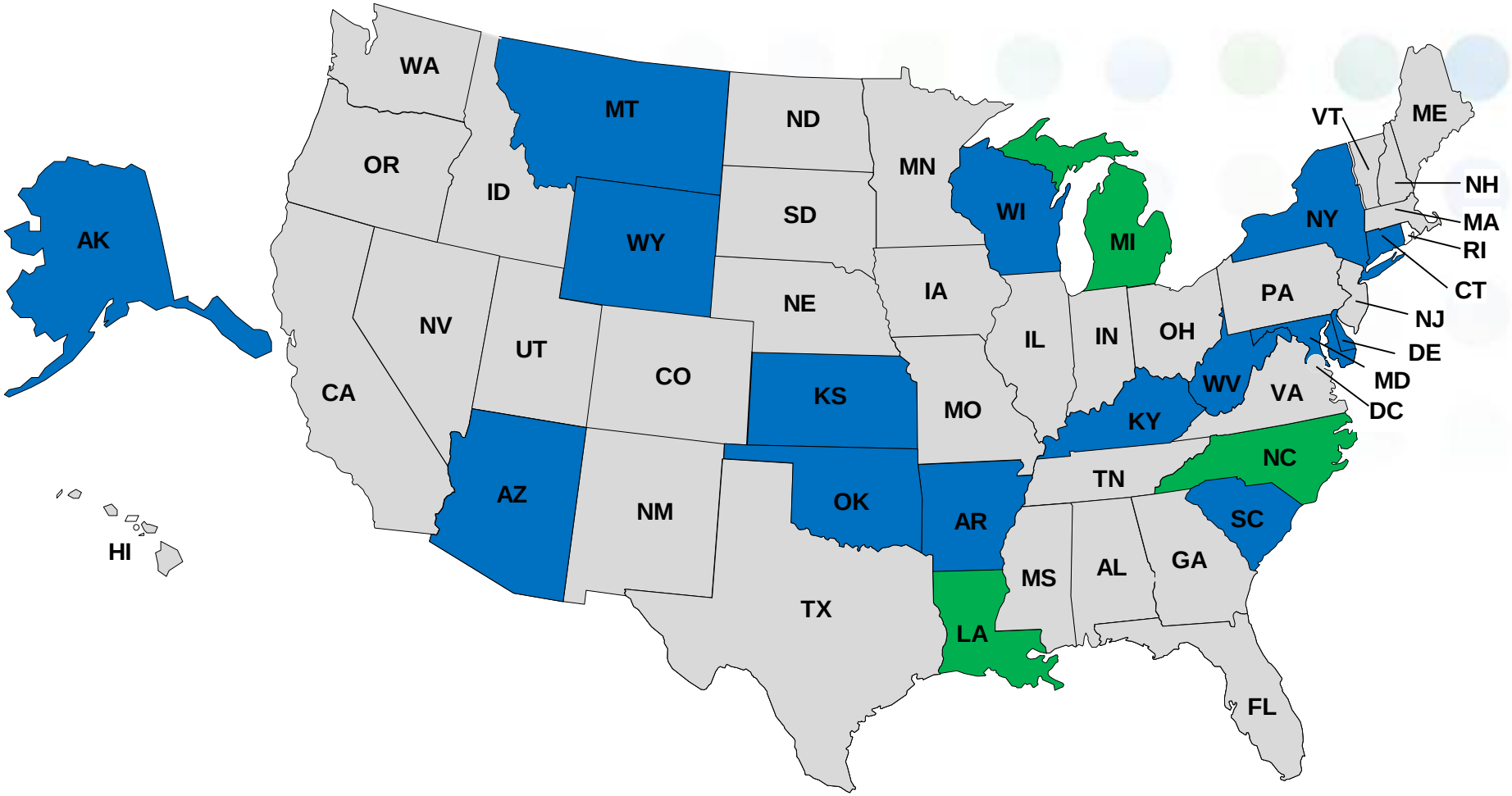
Sample Benefits from Drone Use

Overall

- More productive staff time (more time analyzing collected data and less time collecting information)
- Increased staff safety
- Easier access to tough terrain
- Reduced impacts to sensitive ecosystems
- Greater ability to oversee large areas such as forests, abandoned or reclaimed mine sites
- Ability to monitor sites over time
- Move projects forward more quickly and manage them more effectively
- Better and more accurate data collection
- Ability for real-time results
- More effectively respond to emergencies

More Specific

- Very high-resolution images - for example, following an earthquake, a drone was use to map fault lines that showed a 6 inch trench, more detail than would be seen from photos taken on the ground
- Able to fly on cloudy days when a regular airplane cannot
- Increased the accuracy of tracking the dispersion, timing, and extent of Rhodamine dye studies
- Cold stun events to document the extent and number of fish affected
- Creating 3-D maps from vertical shots of a mine to develop comprehensive design plans for stabilization or restoration
- Analyze and monitor installed projects to eliminate areas of mosquito-breeding habitat
- More accurate volumetric reporting resulting in reclamation bonds that are more accurately calculated



18 State Environmental Agency Drone Programs

State Program Examples

State	Year Began	Number of Certified Operators/Drones	Select Program Highlights
Alaska	2019	• 12 drones • 7 FAA certified pilots • 56 pilots in training	• Source water evaluation • Support compliance and enforcement complaints such as with wood smoke • Evaluate mine-tailing ponds and flooding events
Connecticut	2018	• 1 DJI Inspire 1 Drone • 4 FAA certified pilots	• Water monitoring of cyanobacteria plumes • Visual and thermal imagery for fire suppression efforts • Monitor oil spill in catch basin
Kentucky	2014	• 11 drones • 14 FAA certified pilots	• Flooding event response, spill response • Monitor dam conditions • Map ridgeline and water surface elevation, mine sites • Landfill inspection and documentation • Underground storage tank installation • Document construction clean-ups

ECOS Drone Research Contacts

- Beth Graves, Executive Project Manager, bgraves@ecos.org, 202-266-4923
- Paulina Lopez-Santos, Project Associate, plopezsantos@ecos.org, 202-266-4920

You can find environmental agency drone case studies and links to procedures, videos, and other resources by visiting www.eecip.net

E-Enterprise Community Inventory Platform registration approval is automatic for anyone with a .gov or .us email address

ECOS

E-ENTERPRISE
for the environment

Michigan Environment, Great Lakes, and Energy (EGLE)

Art Ostaszewski

ostaszewskia@michigan.gov

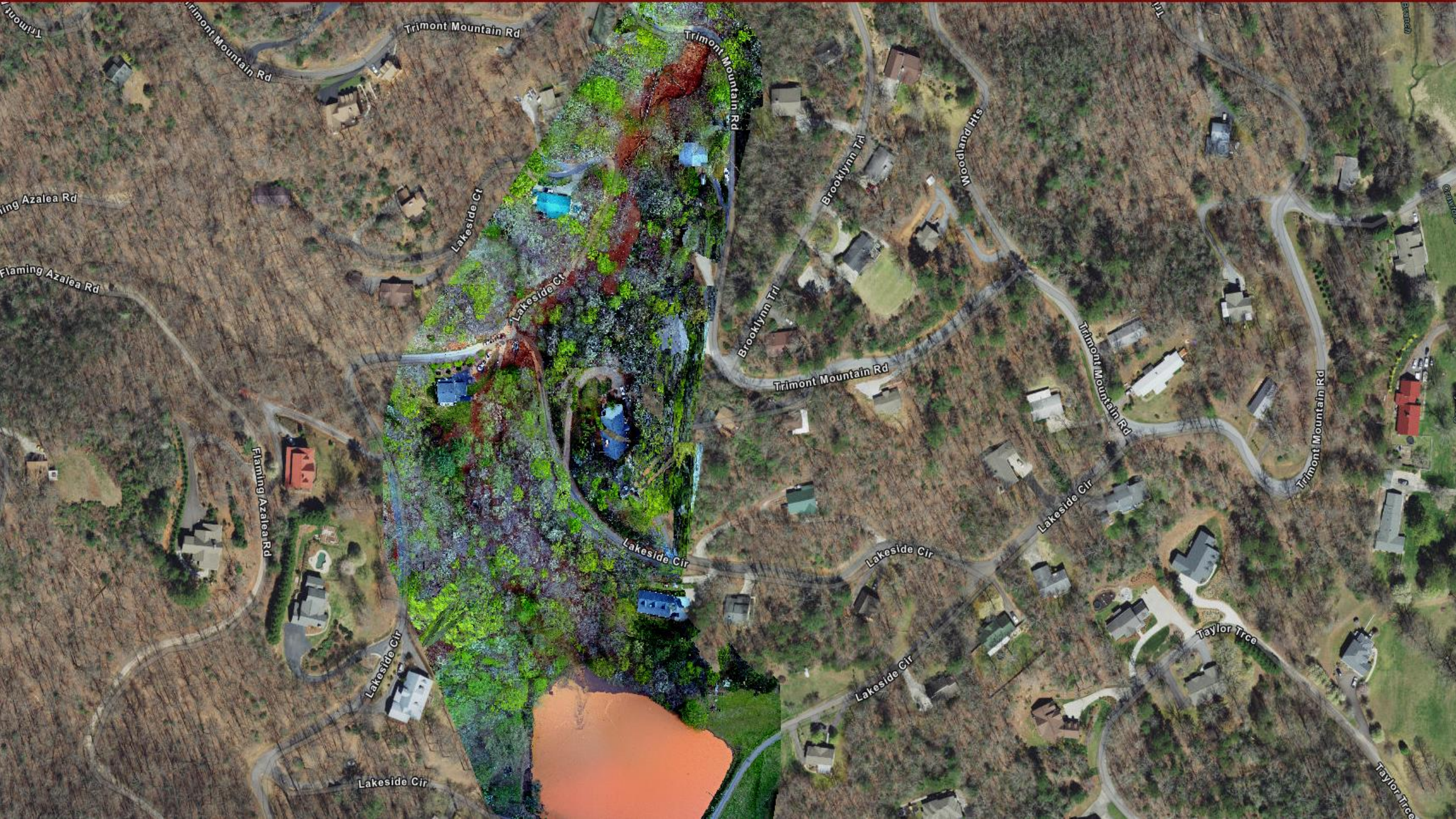
Shakopee Mdewakanton Sioux Community

Ryan Bonney

ryan.bonney@shakopeedakota.org

North Carolina Department of Environmental Quality

Michael Griffin
michael.griffin@ncdenr.gov
Toby Vinson
toby.vinson@ncdenr.gov
Michael Ware
mike.ware@nc.gov


Trimont Mountain Rd
Trimont Mountain Rd
Trimont Mountain Rd
Lakeside Ct
Lakeside Ct
Brooklynn Trl
Brooklynn Trl
Woodland Hts
Trimont Mountain Rd
Trimont Mountain Rd
Trimont Mountain Rd
Flaming Azalea Rd
Flaming Azalea Rd
Flaming Azalea Rd
Lakeside Cir
Lakeside Cir
Lakeside Cir
Lakeside Cir
Lakeside Cir
Lakeside Cir
Taylor Trce
Taylor Trce

Trimont Mountain Rd
Trimont Mountain Rd
Trimont Mountain Rd
Lakeside Ct

Fort Sill Apache Tribe

Josh Worcester
josh.worcester@fortsillapache-nsn.gov
Monte Scammahorn
Monte.Scammahorn@fortsillapache-nsn.gov

Fort Sill Apache Environmental

Josh Worcester

Environmental Coordinator

Environmental Programs:

The Fort Sill Apache Environmental Program (FSAEP) is funded by the Environmental Protection Agency (EPA). The FSAEP currently operates a General Assistance Program (GAP), 103 Air Quality Program, 106 Water Quality Program, and a UAV Drone Program.

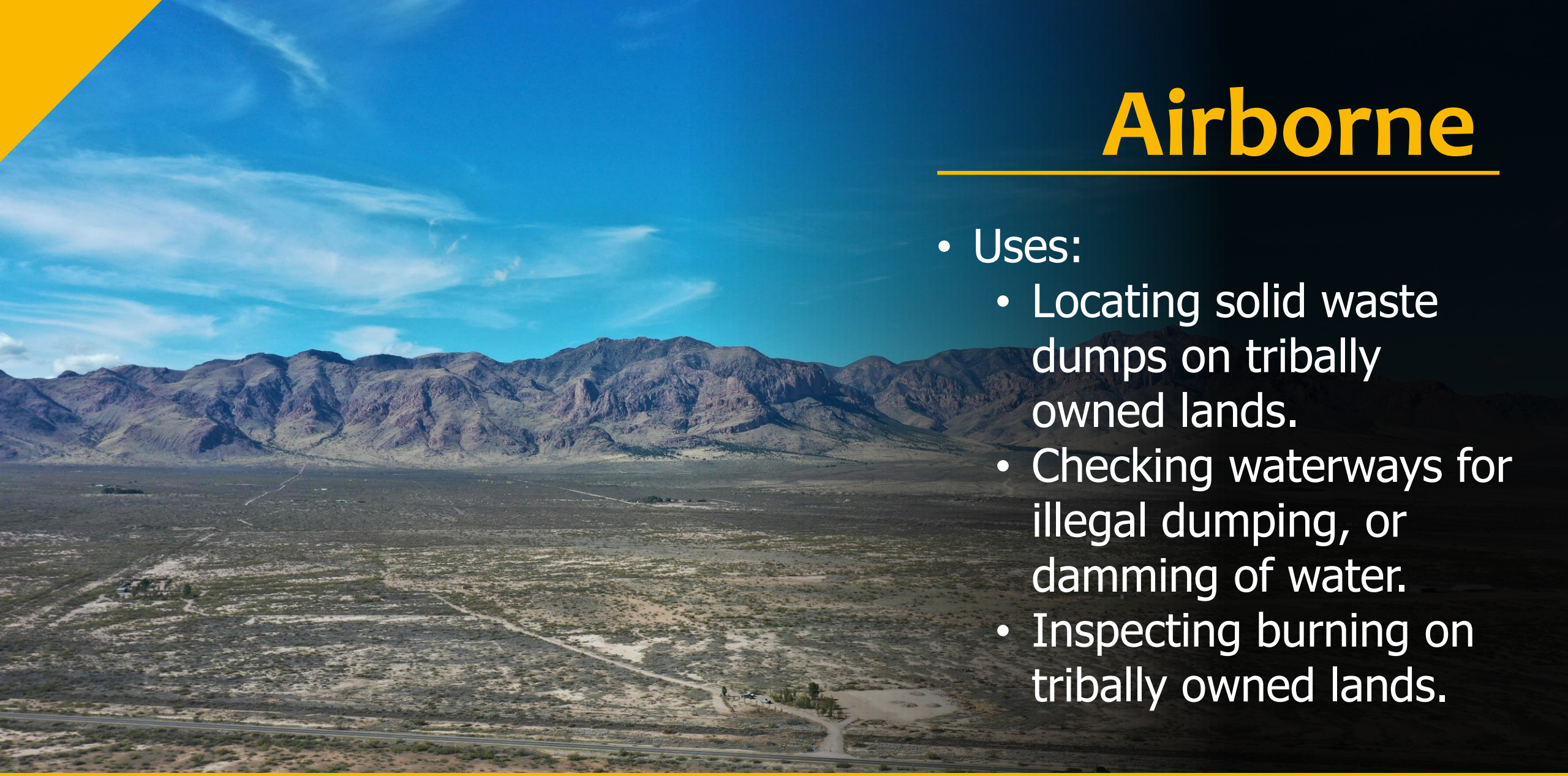
- Operates Unmanned Aerial Vehicle (UAV) to perform checks on tribally owned lands for any concerns related to solid waste, water quality, and air quality.
- Educational Outreach Events
- Future plans include incorporating Geographic Information System(GIS) into program.
- Mapping Tribally Owned Lands

UAV
DJI Mavic Pro 2

- Working on a budget.
- Package had everything we would need to achieve our goals.
- Mavic 2 fly more kit.
  - Mavic shoulder bag
  - Extra blades
  - 2 Extra batteries
  - Battery charging hub
  - Car Charger

Start

- Drone was purchased through tribes Transportation program.
- Initially the Tribe wanted pictures of their lands to show tribal members.
- Once we got the Drone we found it can benefit the Tribe even more than originally thought.



Airborne

- Uses:
  - Locating solid waste dumps on tribally owned lands.
  - Checking waterways for illegal dumping, or damming of water.
  - Inspecting burning on tribally owned lands.

Landing

- All pictures, and videos taken are evaluated.
- Pictures and videos taken on tribal lands are made readily available to any tribal member.
- Drone is kept in the Environmental offices.
- Future program goals.
  - Map out Tribally owned lands
  - Gain a better understand of waterways in tribal jurisdiction.

FORT SILL-CHIRICAHUA-WARM SPRINGS-APACHE
ENVIRONMENTAL
580-588-2298

Thank you!

Louisiana Department of Environmental Quality

Jason Smith

Jason.Smith@la.gov

Play Video

U.S. EPA Region 9

Pete Guria

Guria.Peter@epa.gov

U.S. EPA UNMANNED AERIAL SYSTEMS PROGRAM

Deploying Drones/Unmanned Aerial Vehicles (UAVs) for Improved Environmental Results

December 17, 2020

Pete Guria, US EPA

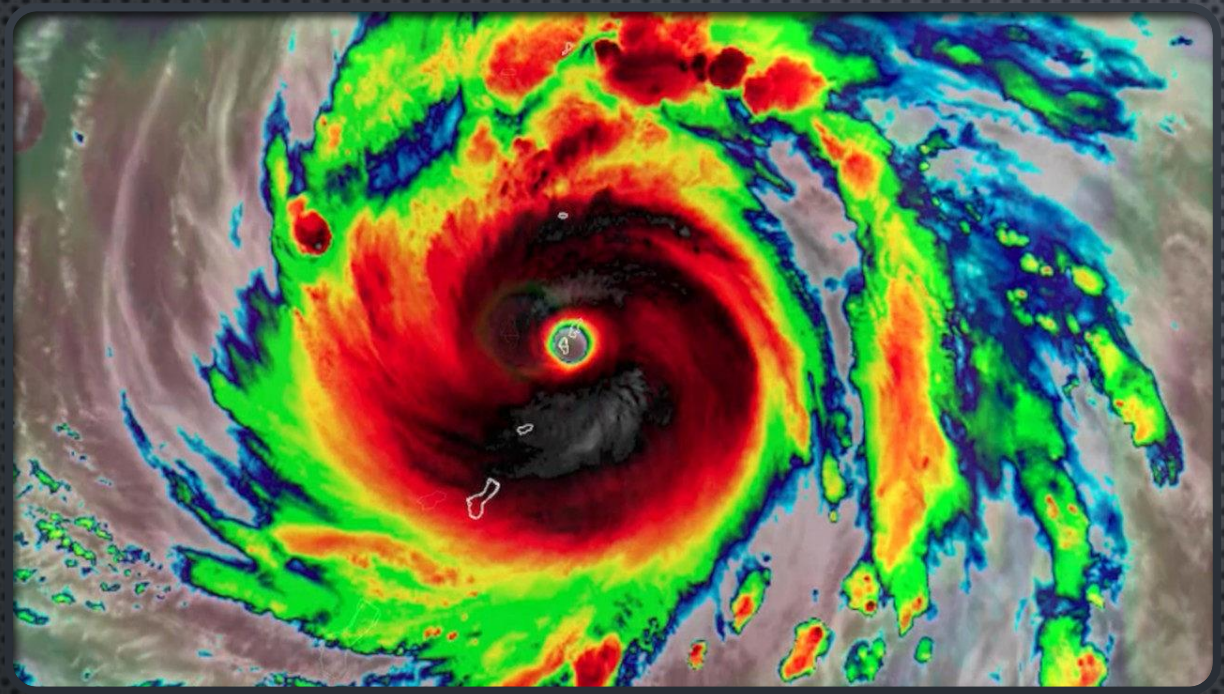
Emergency Response, Planning and Preparedness Branch

US EPA UNMANNED AERIAL SYSTEM (UAS) POLICY

- UAS Policy developed
  - Signed by the Chief Information Officer 2-Dec-20
  - Est. categories for operation & conditions for use
  - Requirements for data collection/Mgmt, security, privacy, utilization reporting
  - Requires development of UAS Procedures and Training

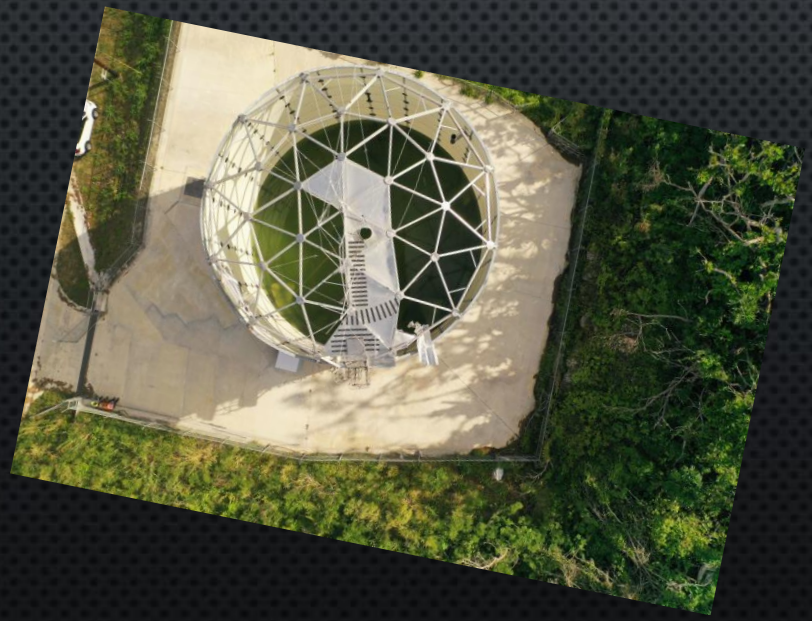
US EPA USE OF UAVS PRIOR TO AGENCY POLICY

- DISASTER RESPONSE
  - SUPER TYPHOON YUTU 2018
  - CALIFORNIA & OREGON WILDFIRES 2020
- SUPERFUND
  - TIME-CRITICAL REMOVAL ACTIONS 2020



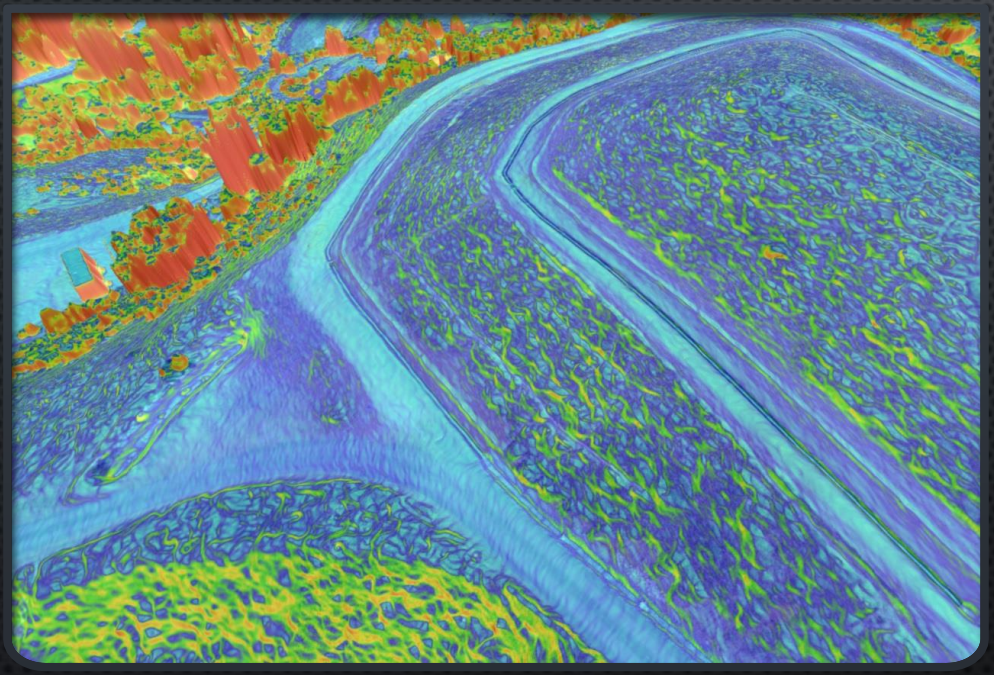
SUPER TYPHOON YUTU COMMONWEALTH OF THE MARIANA ISLANDS (CNMI)

- Assessment & Survey of Damage
  - Aerial imagery
    - Water tanks, transformers, UXO
  - Three-dimensional survey/model of impacted areas
    - Waste staging areas
    - Landfill capacity



2020 CALIFORNIA AND OREGON WILDFIRES

- Develop base maps for recon/field teams
- Survey of large impacted areas in rugged terrain
- Identify damaged structures in remote areas not identified by counties
- Identify locations to install erosion control measures for impacted slopes on waterways (OR)



KLAU BUENA VISTA MERCURY MINE NPL SITE PASO ROBLES, CA

- Interim removal action
- Releasing mercury to lake Nacimiento
- Repair to repository runoff collection system
- Threat of failure to repository cap over consolidated mine waste
- LiDAR and photogrammetry for mapping, leveling, and volumetric info