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Above the Site/How UAV Sensing Turns Environmental Conditions into Better Decisions: Matt Acree, P.G., (Terracon) Arkansas Environmental Federation Convention Presentation

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Matt Acree, P.G., undertook a presentation on October 8th at the Arkansas Environmental Federation Convention titled:

ABOVE THE SITE – How UAV sensing turns environmental conditions into better decisions (“Presentation”).

Matt is a Staff Geologist at Terracon.

Unmanned Aircraft Vehicles (“UAVs”) (i.e., drones) are being increasingly utilized in various environmental activities. This is true for both the government and private sector. For example, a number of state environmental agencies (including Arkansas) have utilized UAVs for various purposes for a number of years. An Environmental Council of the States report notes that state environmental agencies have used drones to undertake activities such as:

- Surveillance.
- Enforcement.
- Permit documentation.
- Waste and landfill inspections.
- Investigation of illegal dumping of chemicals, oils, or waste tires.
- General emergency response functions including at facility discharges, train derailments, truck accidents, and oil spills.
- Investigation of unusual events.

UAVs can be utilized by both governmental agencies and private sector facilities and/or consultants because of their ability to:

- Quickly obtain data.
- Provide more effective response to emergencies.
- Better ensure worker safety.
- Improve environmental results.

Matt’s Presentation addressed the use of UAVs in terms of the multiple ways to see a site, noting:

- RGB

- Current visual record - High-resolution imagery for context, exhibits, and communication.
- Photogrammetry
- Measurable 3D surfaces - Orthomosaics, meshes, and terrain from overlapping imagery.
- Lidar
- Dense elevation data - Terrain, contours, volumes, drainage, and change analysis.
- Thermal
- Temperature contrast - Patterns and anomalies for focused follow-up.
- Multispectral
- Spectral response - Vegetation condition and patterns beyond visible color.

The UAV process from flight to decision was discussed, noting:

- Collect.
- Capture site data.
- Process.
- Build maps and surfaces.
- Interpret.
- Apply the information to the task.
- Deliver.
- Provide the final product.

Environmental applications were discussed, including:

- Site documentation.
- Water and terrain.
- Change over time.
- Vegetation and habitat.
- Event response.
- Solid waste.

A case study of a local municipal landfill's use of a UAV was then undertaken, referencing the repeatable aerial data supporting the annual engineering inspection and site understanding. The following aerial deliverables were referenced:

- Updated surface.
- Airspace use.
- Remaining capacity.
- Site life.
- Fill progression.

Drone imagery and a topographic map of the site were included.

A copy of the slides from Matt's Presentation can be found [here](#).