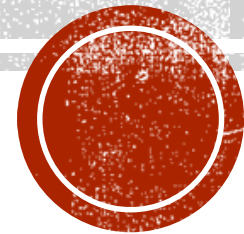


USING DRONES IN UTILITY WORK 2017

Mark Kleine – McCoy Tree Surgery

OPCA Fall 2017





UAS AND THE UTILITY INDUSTRY

- Any of you using drones in your utility company?
- For what purpose?
- Any thoughts of doing something?
- Any projects in the works?





DRONES AND THE UTILITY INDUSTRY

- Drones are suited for applications that are typically costly, dull, dirty and/or dangerous.
- Transmission structure location, documentation and inspection.
- Aerial survey after natural disaster.
- Emergency management of remote facilities.



McCoy Tree Surgery Line Documentation



Map Center Location Latitude: 32.3456643564504 Longitude: -95.548501 Search Radius (Km): 1 Contract: 040 Circuit: Print



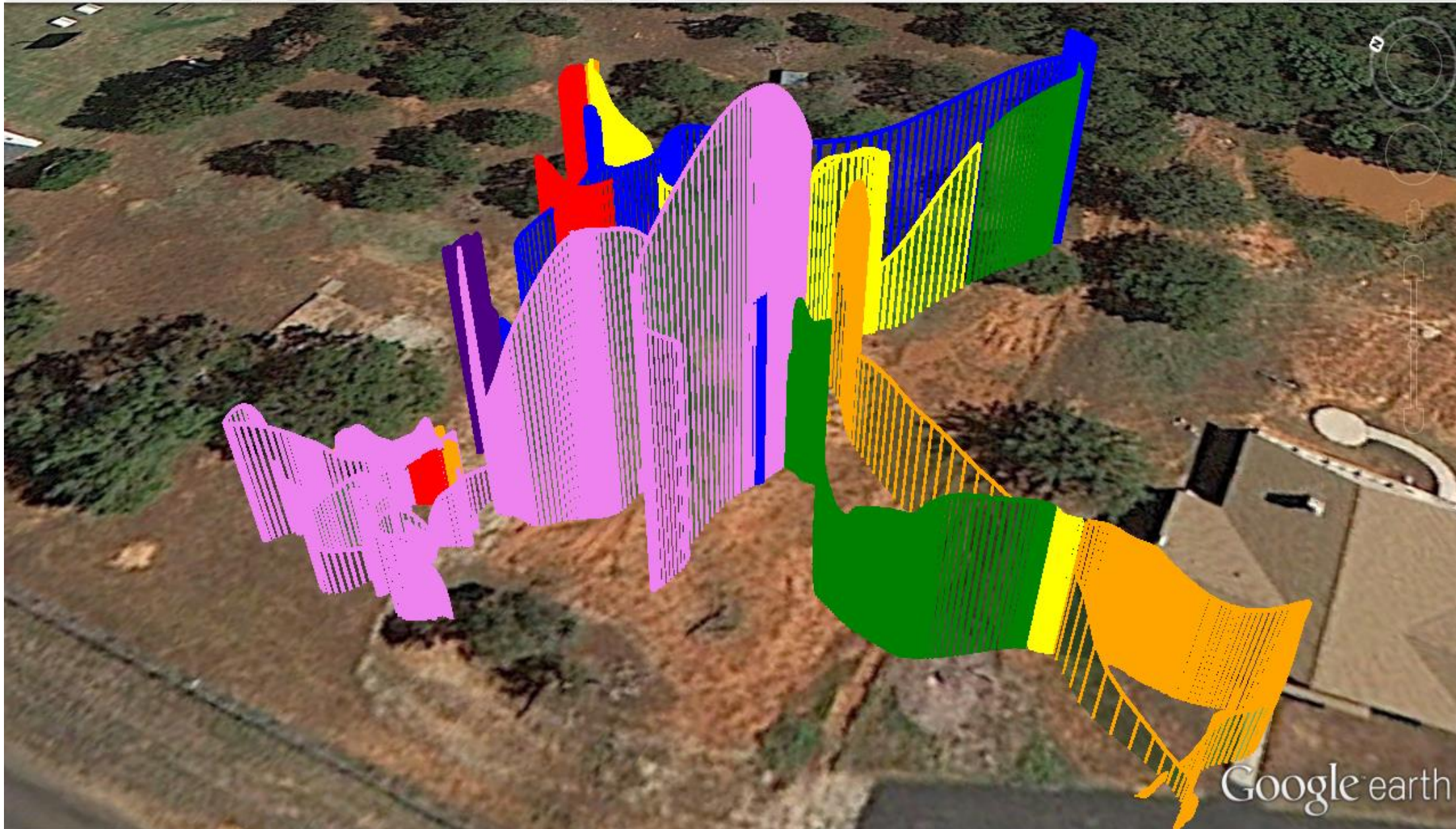
REMOTE SENSING

- Location
- Time Stamps
- Height above ground
- Visual Cameras
- Infrared Cameras





Sign in



Google earth

Tour Guide

1995

Imagery Date: 10/5/2013 35°11'11.92" N 97°19'02.68" W elev 1158 ft eye alt 1344 ft

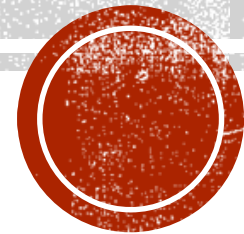


TOWER INSPECTIONS



LONG TERM GOALS

Automated, remote sensing powerline documentation.





Distance: 0.6313 miles
 Prev: 1571.23 ft AZ: 60
 Home: 1554.40 ft



Zoom

Action

GEO 35.257850
 -97.484018
 363.03m

Grid [View KML](#)

BingHybridMap

Status: loaded tiles

[Load WP File](#)

[Save WP File](#)

[Read WPs](#)

[Write WPs](#)

Home Location
 Lat 35.25530062
 Long -97.48819112
 Alt (abs) 1181

Waypoints

WP Radius 30 Loiter Radius 45 Default Alt 100 Verify Height [Add Below](#) Alt Warn 0 Spline

	Command	Del				Lat	Long	Alt	Delete	Up	Down	Grad %	Dist	AZ
1	WAYPOINT	0	0	0	0	35.2547...	-97.4876...	100	X	🏠	⬇️	37.8	264.6	143
2	WAYPOINT	0	0	0	0	35.2547...	-97.4867...	100	X	🏠	⬇️	0.0	258.9	89
3	WAYPOINT	0	0	0	0	35.2547...	-97.4862...	100	X	🏠	⬇️	0.0	157.2	85
4	WAYPOINT	0	0	0	0	35.2577...	-97.4865...	100	X	🏠	⬇️	0.0	1087.2	355
5	WAYPOINT	0	0	0	0	35.2574...	-97.4885...	100	X	🏠	⬇️	0.0	591.8	259

FMRA OF 2012

- The FAA Modernization and Reform Act of 2012 mandated that the FAA:
- Create six UAS test sites
- Develop rules and regulations to allow operation of UAS within the NAS by September of 2015
- Codified some of the hobby rules
- Provided conditions for exemptions



SECTION 333

- Grants authority to the FAA to allow UAS to operate in the NAS early. Specifically, Section 333 authorizes the FAA to determine:
- If certain unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and
- Whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph 1.



DRONE REGISTRATION

- The Federal Aviation Administration (FAA) requests drone owners to register each drone that is purchased weighing between .55 lbs to 55 lbs.
- Recreational – personal flights only.
- Commercial – Commercial, government or non-hobby purposes, including non-profits. (This is under FAA Part 107 rules.)
- <https://registermyuas.faa.gov/>



FAA COMMERCIAL RULES



DRONE RESTRICTIONS - 1

- Unmanned aircraft must weigh less than 55 lbs. (25 kg).
- Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer.
- At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.
- Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.
- Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting.
- Must yield right of way to other aircraft.



DRONE RESTRICTIONS - 2

- May use visual observer (VO) but not required.
- First-person view camera cannot satisfy “see-and-avoid” requirement but can be used as long as requirement is satisfied in other ways.
- Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure.
- Minimum weather visibility of 3 miles from control station.
- Operations in Class B, C, D and E airspace are allowed with the required ATC permission.
- Operations in Class G airspace are allowed without ATC permission.
- No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time.



DRONE RESTRICTIONS - 3

- No operations from a moving aircraft.
- No operations from a moving vehicle unless the operation is over a sparsely populated area.
- No careless or reckless operations.
- No carriage of hazardous materials.
- Requires preflight inspection by the remote pilot in command.
- A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS.



DRONE RESTRICTIONS - 4

- Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375.
- External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft.
- Transportation of property for compensation or hire allowed provided that-
 - The aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total;
 - The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and
 - The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession.
- Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver.



DRONE CERTIFICATIONS

- I will be aware of FAA airspace requirements:
[http://www.faa.gov/uas/where to fly/airspace restrictions](http://www.faa.gov/uas/where%20to%20fly/airspace%20restrictions)
- I will NOT fly over stadiums and sports events
- I will NOT fly near emergency response efforts such as fires
- I will NOT fly near aircraft, especially near airports
- I will NOT fly under the influence



COMMERCIAL DRONE PILOT REQUIREMENTS

- Must be at least 16 years of age
- Read, speak, write, and understand English
- Be in good physical and mental health
- Pass initial Aeronautical Knowledge exam at an FAA center
- Valid for 2 years – Pass another recurrent knowledge test every 2 years





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SKU: RPKT BS Categories: [Remote Pilot](#), [Drones / sUAS](#)



FAA OKLAHOMA TEST CENTERS - \$150

- Altus
- Bethany x 2
- Chickasha
- Durant
- Enid
- Norman
- Oklahoma City
- Shawnee
- Stillwater
- Tulsa x 3



FLYING OVER MILITARY BASES

- The FAA and the Department of Defense have agreed to restrict drone flights up to 400 feet within the lateral boundaries of 133 facilities. The restrictions will be effective April 14, 2017.

In Oklahoma:

- Altus AFB
- Vance AFB



FLYING OVER LANDMARKS

The FAA and DOI have agreed to restrict drone flights up to 400 feet within the lateral boundaries of these sites:

- Statue of Liberty National Monument, New York, NY
- Boston National Historical Park (U.S.S. Constitution), Boston, MA
- Independence National Historical Park, Philadelphia, PA
- Folsom Dam; Folsom, CA
- Glen Canyon Dam; Lake Powell, AZ
- Grand Coulee Dam; Grand Coulee, WA
- Hoover Dam; Boulder City, NV
- Jefferson National Expansion Memorial; St. Louis, MO
- Mount Rushmore National Memorial; Keystone, SD
- Shasta Dam; Shasta Lake, CA

As of: 10/5/2017



NTIA BEST PRIVACY PRACTICES

But even safe flight might not respect other people's privacy. These are voluntary guidelines. No one is forcing you to obey them. Privacy is hard to define, but it is important. There is a balance between your rights as a drone user and other people's rights to privacy. That balance isn't easy to find. You should follow the detailed "UAS Privacy Best Practices", on which these guidelines are based, especially if you fly drones often, or use them commercially. The overarching principle should be peaceful issue resolution.

- If you can, tell other people you'll be taking pictures or video of them before you do.
- If you think someone has a reasonable expectation of privacy, don't violate that privacy by taking pictures, video, or otherwise gathering sensitive data, unless you've got a very good reason.
- Don't fly over other people's private property without permission if you can easily avoid doing so.
- Don't gather personal data for no reason, and don't keep it for longer than you think you have to.
- If you keep sensitive data about other people, secure it against loss or theft.
- If someone asks you to delete personal data about him or her that you've gathered, do so, unless you've got a good reason not to.
- If anyone raises privacy, security, or safety concerns with you, try and listen to what they have to say, as long as they're polite and reasonable about it.
- Don't harass people with your drone.



FAA MOBILE APP AND WEB INFO

- B4UFLY App

- <http://uas-faa.opendata.arcgis.com>

- <http://knowbeforeyoufly.org>



DRONE DETECTION INITIATIVE

- The FAA signed Cooperative Research and Development Agreements (CRDAs) with Gryphon Sensors, Liteye Systems Inc. and Sensofusion.
- The FAA will evaluate procedures and technologies designed to identify unauthorized UAS operations in and around airports. This research effort, part of the FAA's Pathfinder Initiative, addresses one of the significant challenges to safe integration of UAS into the nation's airspace.



EMERGENCY RESPONSE OPERATIONS

[FAA Home](#) ▶ Unmanned Aircraft Systems

Unmanned Aircraft Systems



Drone Users

The FAA warns unauthorized drone operators that they may be subject to significant fines if they interfere with emergency response operations. Flying a drone without authorization in or near the disaster area may violate federal, state, or local laws and ordinances, even if a [Temporary Flight Restriction \(TFR\)](#) is not in place. Allow first responders to save lives and property without interference.



HURRICANE IRMA AUTHORIZATIONS

- FAA issued 137 airspace authorizations as of 9/15/2017

Surveyed infrastructure, such as power plants for FEMA.

- Air National Guard
- U.S. Customs and Border Protection



HURRICANE IRMA AUTHORIZATIONS

Documented for insurance companies

- Airbus Aerial



HURRICANE IRMA AUTHORIZATIONS

Electric Utilities

- Jacksonville Electric Authority used drones to provide damage assessment in less than 24 hours, and ensure the safety of its crews.
- Florida Power and Light had 49 contract drone teams surveying parts of the state not accessible by vehicles. Some less than 1 hour after winds subsided.



FAA ADMINISTRATOR — MICHAEL HUERTA

- “Essentially, every drone that flew meant that a traditional aircraft was not putting an additional strain on an already fragile system. I don’t think it’s an exaggeration to say that the hurricane response will be looked back upon as a landmark in the evolution of drone usage in this country.”



DRONES AND THE UTILITIES, WHAT'S STILL MISSING??



THANKS

- Mark Kleine
- McCoy Tree Surgery
- mkleine@mccoytree.com

