DRONES AND BOATING

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About me

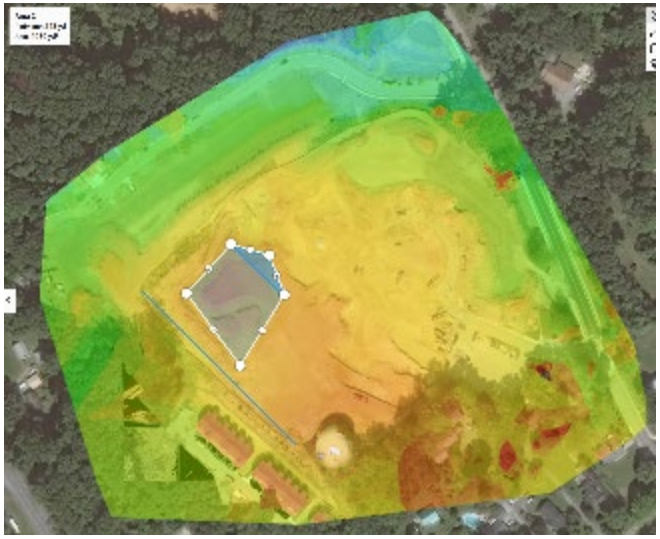
- Owner : Chesapeake Aerial Photo, LLC
- FAA 107 UAS Pilot
- Lifelong Sailor

What is a “Drone”

- Unmanned Aircraft
- UAS or UAV
- FAA Small UAS .55 lbs<>55lbs
- Usually Equipped with sensor or camera
- Rotor or Fixed Wing

FAA Considers Drones “Aircraft”
As such they are subject to all federal airspace rules and regulations

New, Fast Growing Industry



- More than 1 Million drones registered in US
- 7 Million registered by 2021
- Compared to Aprox. 230,000 General Aviation Aircraft
- Aprox. 75 percent hobbyist, 25% commercial
- New Technology and Uses Developing Daily

That's a lot of stuff in the air!

Hobbyist vs Commercial

Hobbyist
(Rule 349- Replaces 336)

Flown strictly for recreational purposes

Examples:

- Taking pretty pictures of your boat for personal use.
- Family vacation videos
- Videos of friend racing regatta or catching fish

Commercial
(Rule 107)

Flying for work, business, non-recreational reasons, or commercial gain.

Example:

- Broker taking drone photos of your boat for sales listing
- Yacht Club taking videos of regatta to promote club

Determined by intent at time of flight

Different Rules for Hobbyists and Commercial Use

Fly under rule 336/349 Hobbyist

- Fly strictly for recreational purposes
- Register your ~~model~~ aircraft
- Follow community-based safety guidelines and fly within the programming of nationwide community-based organization (AMA)
- Fly within visual line-of-site
- Never fly near other aircraft
- Notify the airport and air traffic control tower prior to flying within 5 miles of an airport
- Never fly near emergency response efforts
- Aircraft is flown no higher than 400 ft. AGL (new)
- Operator has passed an aeronautical knowledge and safety test (new)

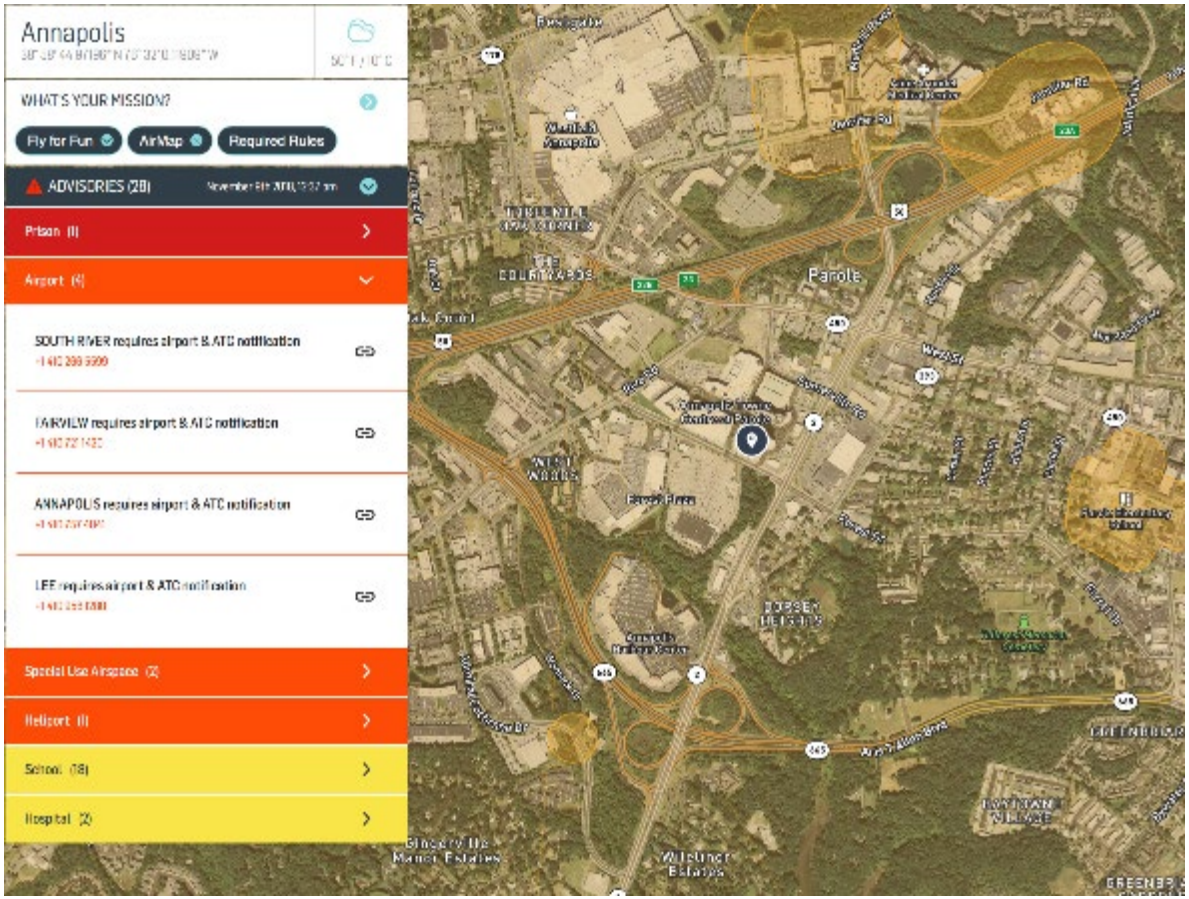
Fly under rule 107 – Commercial

- Fly for recreational or commercial use
- Register your aircraft
- Get a Remote Pilot Certificate from FAA (107 test)
- Fly within visual-line-of-site
- Don't' fly near other aircraft or over people
- Don't' fly in controlled airspace near airports without permission
- Fly only during daylight or civil twilight, at or below 400'

Know airspace before you fly

- Airmap (one of many aps)

3 Airports
1 Heliport



Uses for Drones and Boating

A new way to watch sailing

America's Cup

- https://youtu.be/RAaIpwXia0Y

College and Junior Sailing

Chubb: https://www.facebook.com/USSAILING/videos/10155957342933871/?__tn__=%2CdkC-R&eid=ARAhVjdYEWRh09wK-IISAU3QP_a1eWw0z5fZ971zFSQLwxxVQkguHRZuOAWXAr1oDNvZZo1tbJ1FzC-U&hc_ref=ARQZwTyTFJE-bK6yLC65LGKYl5roMQjlzwY9COULk2_nB-NhmEb6kG6Vc-O82jv-TM4

Race Management/Judging

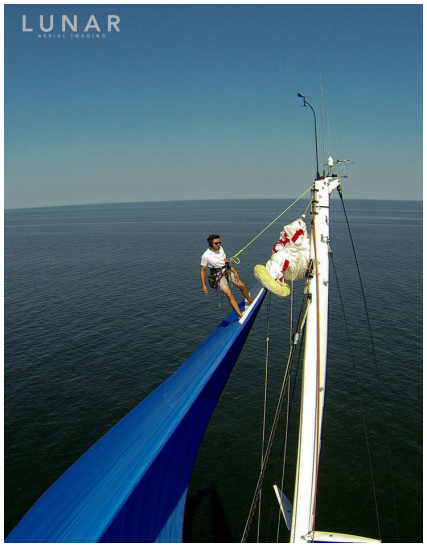
Recreational maritime turning to drones

- Raymarine Axiom UAV
- Integrates drone with marine multifunction display
- Directly connects to UAV
- Split screen shows chart w/drone location, direction etc.
- Other side shows live feed from drone
- Can be used to scout anchorage, view harbor, find fish (“virtual tuna tower”)
- Includes Fish On button — automatically launches drone, tracks boat and records aerial footage of fishing action

A Unique Perspective

Maintance/Inspection

- Identify problems at top of mast before sending crew up rigging



On larger boats, inspect tight spaces
le. Engine room, storage holds on freighters (Drone:Elios Flyablity)

Search and Rescue

- Mavic 2 Enterprise

Man Overboard

- Transponder model
  - Crew transponder activated by water &distance from boat
  - When activated, alarm goes off, drone automatically launches, flies to transponder and hovers near MOB. Can be used with lights, speaker to communicate with MOB
  - Live video and location can be streamed back to ship
  - Could potentially drop flotation device, dye other life saving supplies
  - Automatic activation of transponder notifies crew of MOB immediately as opposed to discovering later that sailor is missing.

Lifeboat MOB Rescue

- Drone launches from front of boat and flies automatic flight pattern around boat.
- Can be mounted with thermal camera to help identify MOB in water
- Can potentially follow exact path of ship

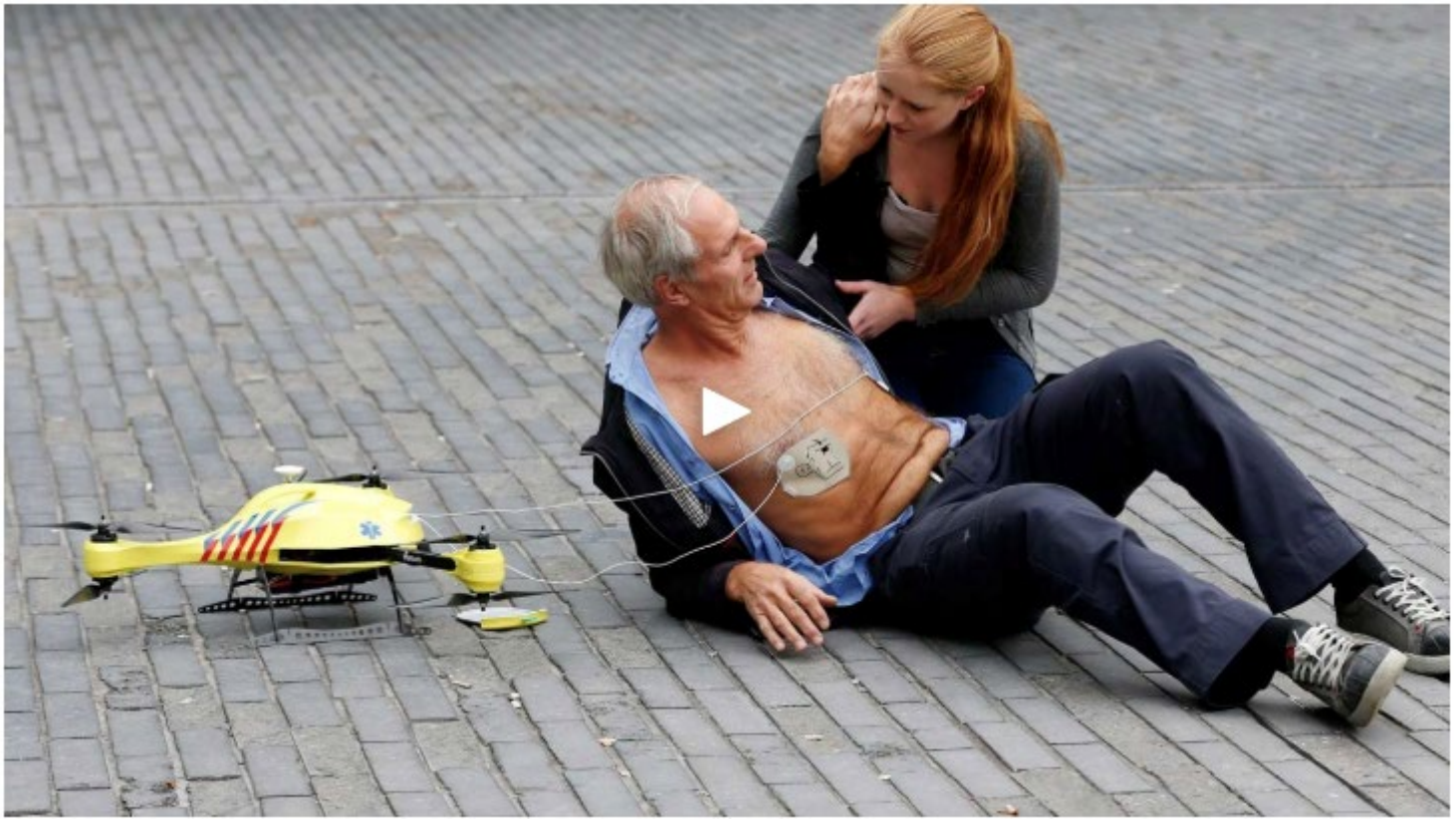
Long Range Drones w/ViDAR

Drop rescue device

- https://youtu.be/Gzs-4yNyL58
- Australian surf rescue

Ambulance Drone (Drones for Good)

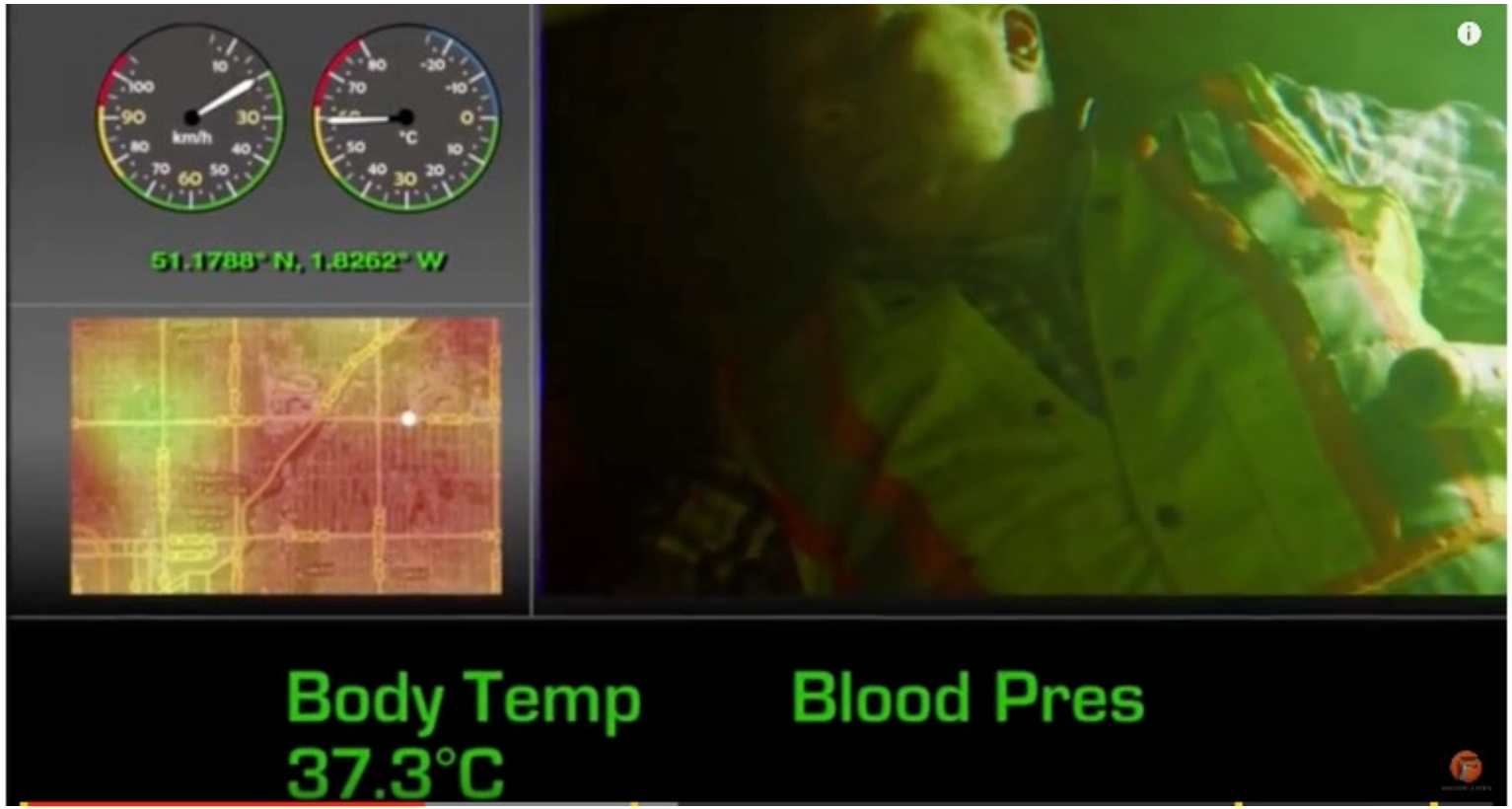
- Delivers defibrillator and guides how to use it



https://www.youtube.com/watch?v=y-rEI4bezWc

Potentially monitor vital systems

- “Navigate” search and rescue system can locate victim and relay information regarding status



Zipline

- Currently delivering medical supplies to remote parts of Africa
- Can deliver supplies within minutes of order
- Could be adapted for off shore use

Environmental Monitoring

What to look for in a drones for boats

- Easy to fly (ie. GPS stabilized)
- Easy to hand launch and land
- Speed (can it keep up with the boat?)
- Stability/wind limits (can it handle heavy winds)
- Does it fit intended purpose (photo/video, MOB/safety)

DJI

Phantom

Mavic

Spark

Parrot

Bebop

Splashdrone 3+ (Waterproof)

SPLASHDRONE 3+ WATERPROOF BASE PLATFORM

USD $1,199.00

Quick Overview

Enhancing and extending the features of the previous SplashDrone 3 ,the latest SplashDrone 3+ is the most reliable and versatile waterproof drone yet .

Coupled with several different payloads such as Cameras and Payload Release Mechanisms .SplashDrone 3+ can be adapted for a wide variety of uses .It is an all purpose,all weather,waterproof flying platform.

Note : SplashDrone 3+ doesn't comes with 3 Axis Gimbal 4k Camera Module ,Payload Release Module and Ground Station Module .You can purchase these items alone according to your demand .

Waterproof 3-Axis Gimbal 4K Camera Module - GC3 (not include in the standard package of SplashDrone 3+)

- (•) None
- ( ) 4k Camera 3 Axis Gimbal +USD $699.00

Payload Release Module (not included in the standard package of SplashDrone 3+)

- (•) None
- ( ) PL2 +USD $149.00
- ( ) PL3 +USD $329.00

Autonomous Flight Ground Station Radio Module (not included in the standard package

Launching/Landing From Boat

- Calibrate on land if possible
- If under sail, launch from back of boat - don't run into boat
- Flat open spot or hand launch
- Drones are programmed to automatically return to home point to land
  - Boat is moving, as boat moves home point is quickly over water
  - Regularly reset home point, use "follow" mode, set drone to use controller as home point
  - Monitor battery so it doesn't automatically return to "home" when you don't want it too.
- Hand catch drone
  - May need to turn off collision avoidance depending on structures on boat

Don’t try this at home:

Demonstrates difficult of landing on a moving boat:
https://youtu.be/q7ZyNarJQYA

Volvo racers are nuts:
https://youtu.be/17RWWVnFij8