

What we Could be Doing with UAVs

Jim Graham

Humboldt State University

June 6th, 2015

CalGIS

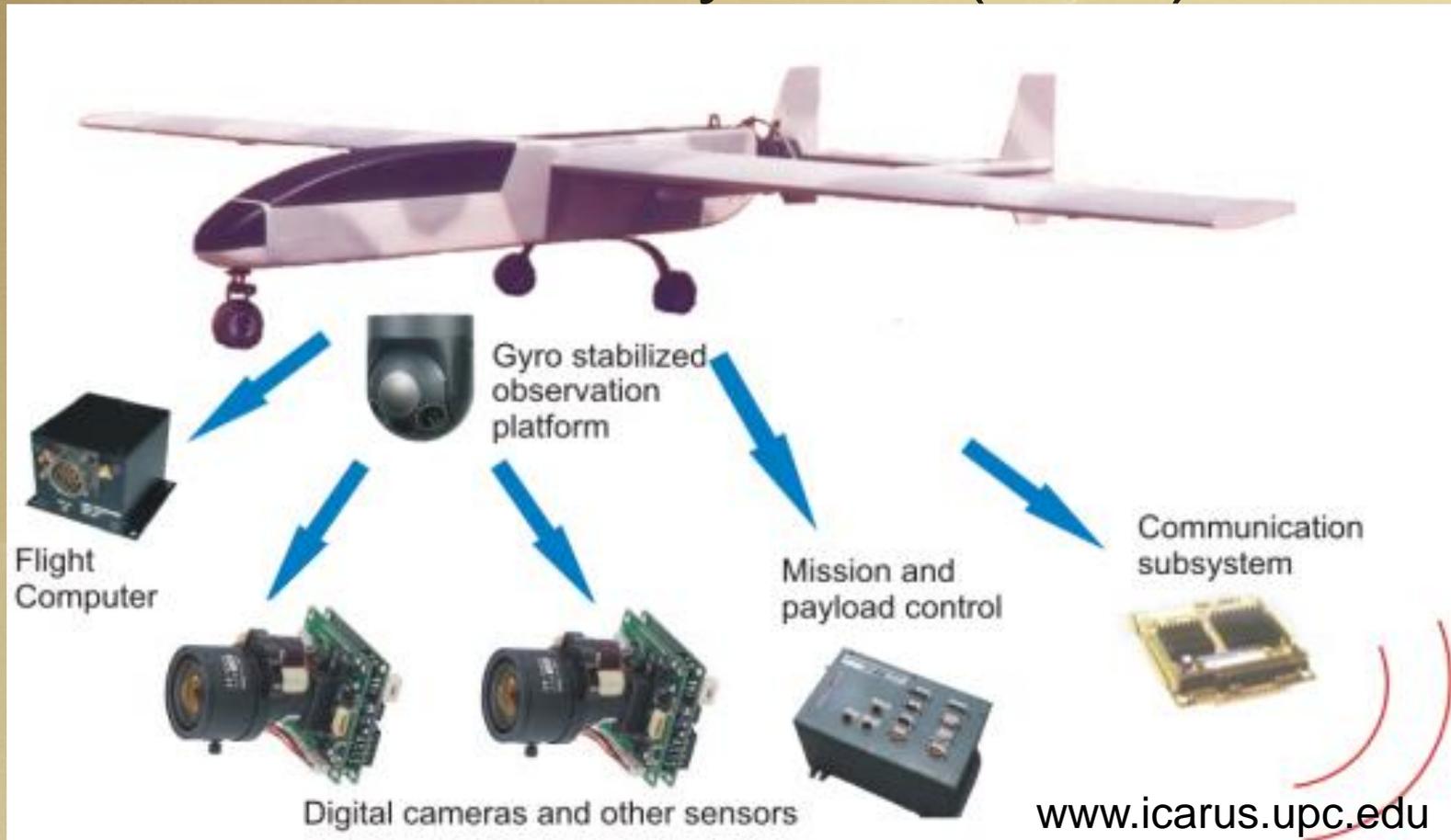


Terminology

- Drones: Military
- UAV:
 - Unmanned Aerial Vehicle
- UAS
 - Unmanned Aerial System
 - Preferred by FAA



Unmanned Aerial System (UAS)



- Plus Processing

Types

Fixed wing

- Fly longer

Rotary

- Carry more



Why are UASs Important

- Less expensive than aerial imagery
 - Thousands of dollars
- Higher resolution
 - 1cm possible
- More flexible
 - Fly when you want!
- Can be automated





Law Enforcement Applications

- The Microdrone UAV, as used by Merseyside police



John Giles/PA Wire

Lakemaid Beer Delivery



FAA Process is very Restrictive

- For government agencies:
 - Have to provide the FAA with a “declaration letter” indicating you are a government agency and will not operate for commercial purposes
 - Then, you can apply for a Certificates of Authorization (COA)
 - Can only fly for purposes of researching their applications
- Note: this is subject to change



What we could be doing

- Research into applications of UAS
- Using UAS to reduce the cost and increase availability of high resolution remotely sensed data



UAS Monitoring a Fire

Lithgow on Fire



wildfiremagazine.org

Poaching in Africa



1,092
Elephants killed
in Kenya since 2010

Applications in Natural Resources

Passive

- Monitoring & Mapping
 - Poaching
 - Search & Rescue
 - Fires
 - Invasive Species
 - Endangered Species
 - Land cover
 - Disasters

Active

- Sampling
- Fire Fighting
- Treatments
 - Herbicides, fertilizer
- Delivering supplies



UAVs Monitoring Harvard Forest



Agricultural Applications

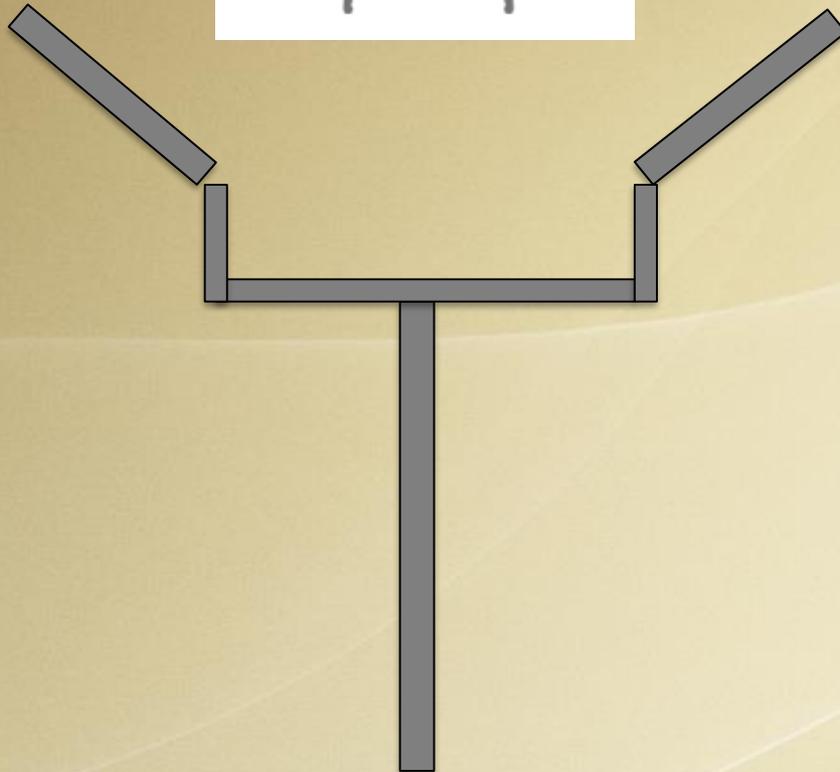
- UAS used for agriculture in France, 2013



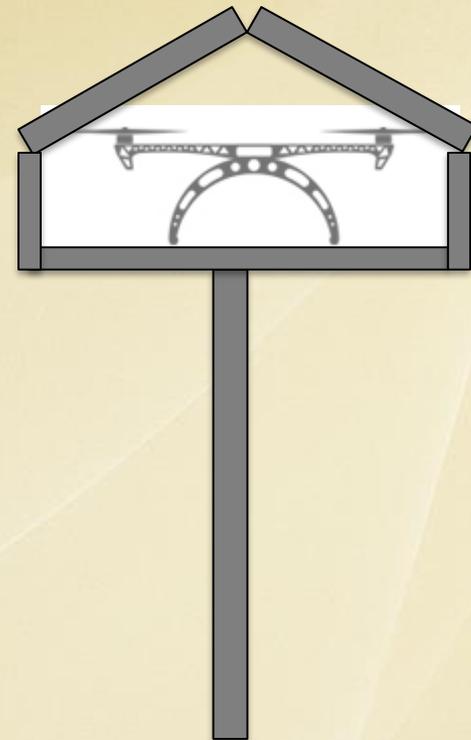
Fire Extinguisher Drone Concept



UAS Nest



Data Collection



Recharge and data download



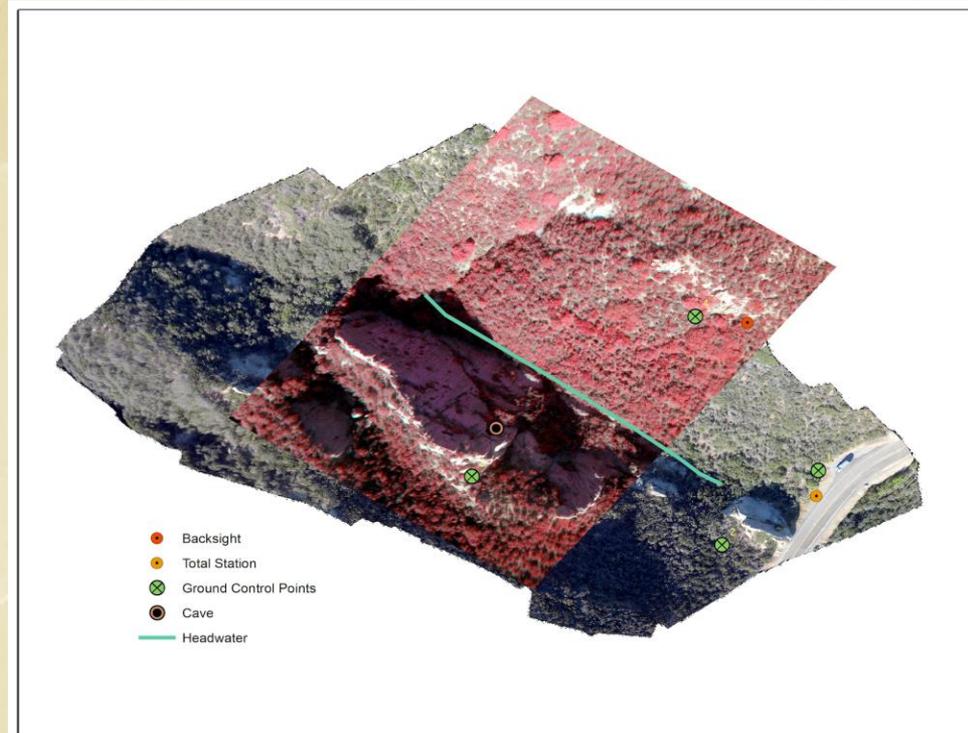
What HSU Is Doing

- California State University has approved our process for obtaining COAs
- We are applying for our first COAs this summer
- We just purchased our first UAS!



The Student UAS Group

- Student's from HSU (not affiliated)
- Researching systems and applications
- thestudentuasgroup.com



Thank you and: Dave Marshal, Chris Muhl

- How Santa really delivers all those presents
- Raptor attacks UAV



The Potential

- Sensors:
 - Elevation (LiDAR)
 - Light:
 - Visual
 - IR
 - Hyperspectral?
 - <http://thestudentuasgroup.com>



- http://www.huffingtonpost.com/2015/05/28/goose-attack-drone_n_7460824.html

