

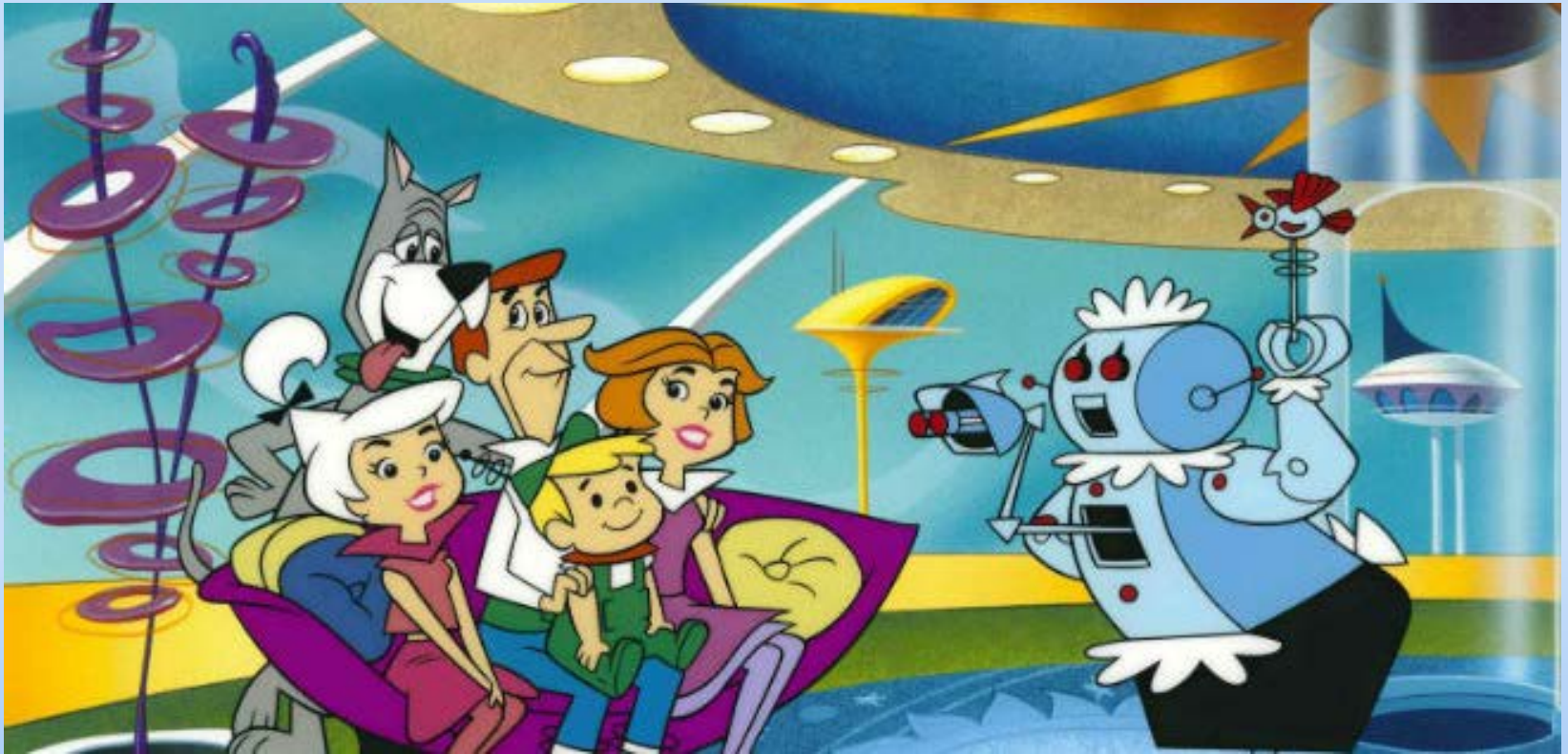
# NAVIGATING THE LEGAL LANDSCAPE FOR ENVIRONMENTAL MONITORING BY UNMANNED AERIAL VEHICLES

Anastasia Telesetsky

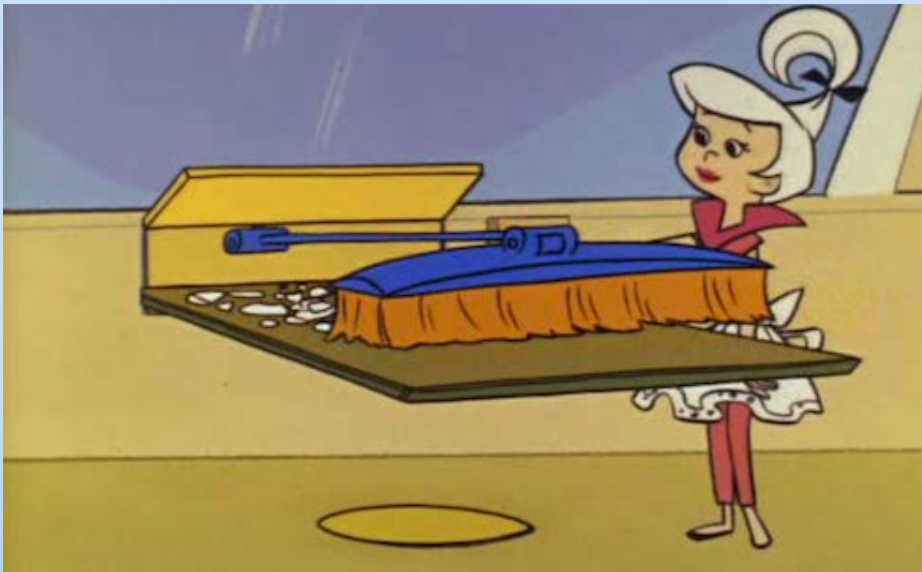
University of Idaho College of Law

Natural Resources and Environmental Law  
Program

# MEET THE FUTURE- 47 YEARS AND COUNTING



# NOT EXACTLY AN ENVIRONMENTAL FUTURE

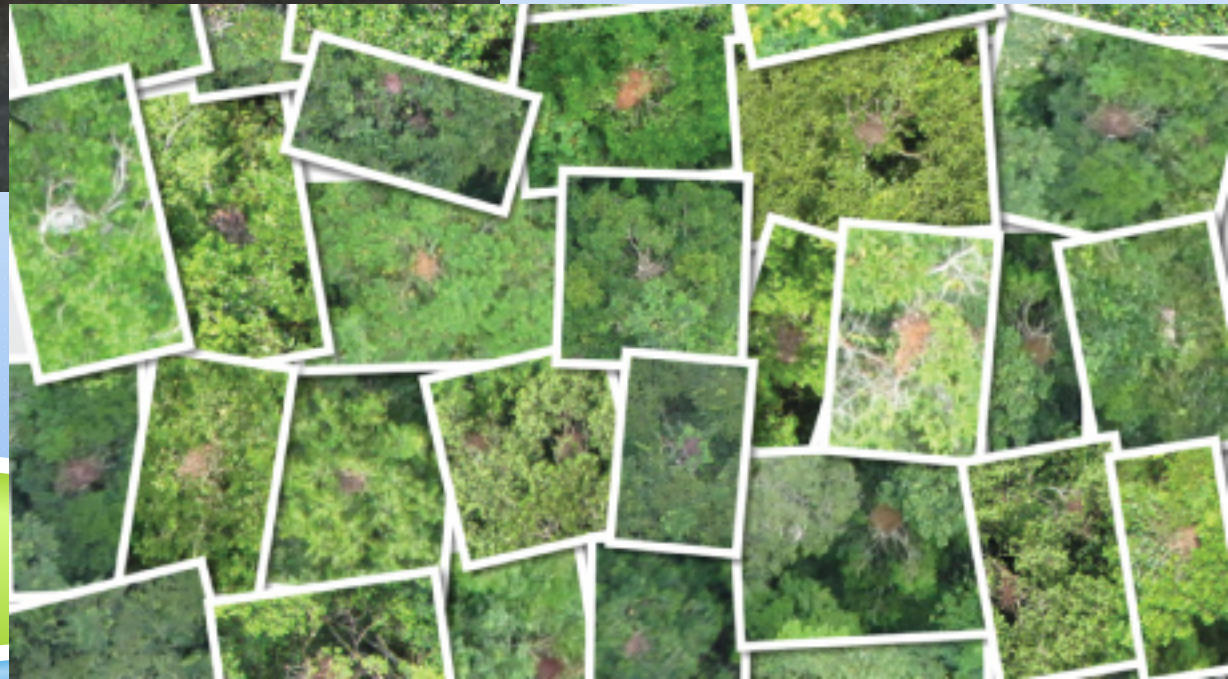


# TECHNOLOGICAL ADVANCES





# POTENTIAL FOR TECHNOLOGY



Photos: Lian Pin Koh

# SOME PROPOSED ENVIRONMENTAL USES



UNEP Global Environmental Alert Service (GEAS)

Taking the pulse of the planet; connecting science with policy

Website: [www.unep.org/geas](http://www.unep.org/geas)

E-mail: [geas@unep.org](mailto:geas@unep.org)



MAY 2013

[Home](#)

[Subscribe](#)

[Archive](#)

[Contact](#)

*Thematic focus: Climate change, Ecosystem management, Environmental governance*

## *A new eye in the sky: Eco-drones*

Change Mapping	Disaster Risk Management	Disaster Risk Mitigation	Illegal Activity	Monitoring
River erosion	Flooding risk	Map impacted areas	Poaching	Migration patterns
Deforestation	Landslide risk	Broadcast messages	Illegal fishing	Endangered species status
Urban expansion	Volcano eruption risk	Monitor forest fire spread	Illegal trade	Agriculture

**Table 3.** Various environmental applications suitable for the use of a drone.

# AIR POLLUTION MONITORING





# WATER POLLUTING MONITORING PRECISIONHAWK AND WATERFLY



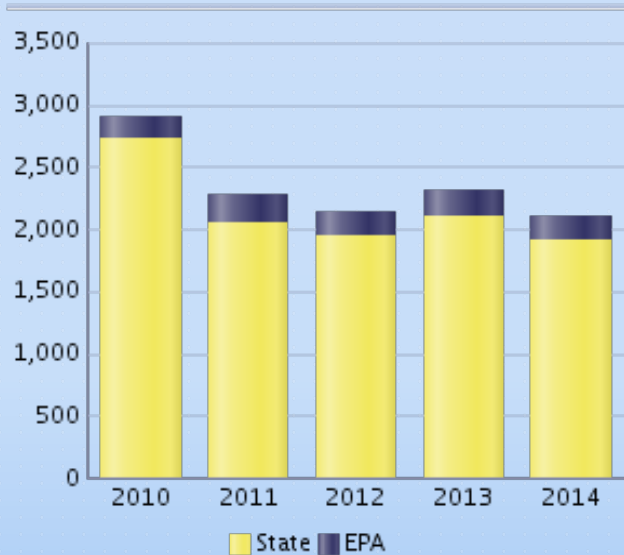


IS THE SKY THE LIMIT ?



# OPERATIONAL BENEFITS?

Number of Formal Enforcement Actions Issued



## Fixed-Wing



*Udrones Arduplane-AP-X*

- Cost: \$550 USD
- Autopilot: APM 2.5
- Carrying Capacity: 300g
- Time: ~20min
- Wind Tolerance: <15m/s

## QuadRotor



*MikroKopter Quadro XL*

- Cost: \$1600 USD
- Autopilot: FlightCtrlME
- Carrying Capacity: 2.5kg
- Time: ~20min
- Wind Tolerance: <10m/s

## Helicopter



*Rotomotion SR30*

- Cost: ~\$15000 USD
- Autopilot: Proprietary
- Carrying Capacity: 8kg
- Time: ~90min
- Wind Tolerance: <20m/s

# FAA REGULATIONS

- ▶ UAV's- National Transportation Safety Board to legally be "aircraft" and are subject to regulation by the Federal Aviation Agency.
  - ▶ *Huerta v. Pirker*, National Transportation Safety Board CP-217 (November 18, 2014), NTSB Order No. EA-5730,
- ▶ Application of Existing Aircraft Regulations Problematic
  - ▶ "Minimum safe altitudes" 14 C.F.R. § 91.119 may pose problems for UAV environmental monitoring program because of height of plumes.
- ▶ Proposed Regulations Problematic
  - ▶ "Operating during the day" may pose challenges because intentional environmental monitoring violations may be more likely at night

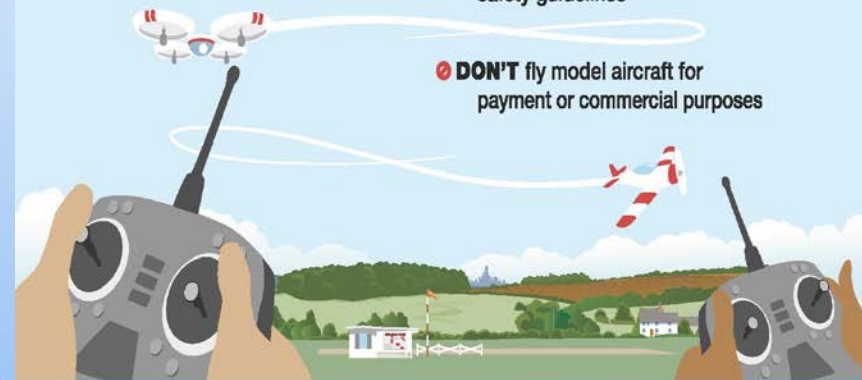
Hobby / Recreational Flying

## What Can I Do With My Model Aircraft?

Having fun means flying safely! Hobby or recreational flying doesn't require FAA approval but you must follow safety guidelines. Any other use requires FAA authorization.

**AVOID DOING ANYTHING HAZARDOUS TO OTHER AIRPLANES OR PEOPLE AND PROPERTY ON THE GROUND**

- ✔ **DO** fly a model aircraft/UAS at the local model aircraft club
- ✔ **DO** take lessons and learn to fly safely
- ✔ **DO** contact the airport or control tower when flying within 5 miles of the airport
- ✔ **DO** fly a model aircraft for personal enjoyment
- ✘ **DON'T** fly near manned aircraft
- ✘ **DON'T** fly beyond line of sight of the operator
- ✘ **DON'T** fly an aircraft weighing more than 55 lbs unless it's certified by an aeromodelling community-based organization
- ✘ **DON'T** fly contrary to your aeromodelling community-based safety guidelines
- ✘ **DON'T** fly model aircraft for payment or commercial purposes



For more information about safety training and guidelines, visit [www.knowbeforeyoufly.org](http://www.knowbeforeyoufly.org)

For more information, visit  
[www.faa.gov/uas](http://www.faa.gov/uas)



Federal Aviation  
Administration



# PRIORITY LEGAL ISSUES:

## ► Liability

- Equipment Failure and Operator Failure leading to damage and loss of property and potential harm to individuals
- Need to Develop Insurance Schemes
  - 1) Equipment Failure- First party insurance (loss of equipment) and third party insurance (injury)
  - 2) Operator Failure- Third party insurance (injury)



The screenshot shows the AIG website's "Unmanned Aircraft" page. The navigation bar includes "AIG", "For Individuals", "For Businesses", "About Us", "News & Insights", "Investors", and "Careers". Below the navigation bar, there is a breadcrumb trail: "... / Insurance / Products and Services / Aerospace". The main heading is "Unmanned Aircraft", with a sub-heading "Unmanned Aircraft Solutions" and a "Contact Us" button. The page content includes a paragraph about the unmanned aircraft industry's growth and AIG's coverage solutions, and a call-to-action button that says "LEARN MORE ABOUT LEXINGTON INSURANCE COMPANY'S".

**AIG** For Individuals For Businesses About Us News & Insights Investors Careers

... / Insurance / Products and Services / Aerospace

## Unmanned Aircraft

Overview Related Downloads

### Unmanned Aircraft Solutions

AIG Insurance Company Contact Us

**Related Topics**

Aerospace  
Casualty

The unmanned aircraft industry is poised for takeoff, with dramatic implications for everything from public safety, to farming, to infrastructure maintenance. Already, unmanned aircraft are enabling jobs ranging from agricultural monitoring, to wildfire surveillance to be done more safely, cost efficiently and effectively than ever before. As regulatory hurdles are cleared, use of unmanned aircraft across a spectrum of industries will accelerate rapidly.

To address the needs of this expanding industry, AIG has developed coverage solutions specifically designed for the exposure faced by remotely piloted, semi-autonomous, and fully autonomous aircraft. Whether through a dedicated, stand alone, unmanned aircraft hull and liability, or liability only, policy applicable to owned and/or non-owned unmanned aircraft, or through a liability only coverage available as an enhancement to a Lexington general liability placement, AIG has the capability and product to handle unmanned aircraft of any size operating in a wide variety of industries.

Learn more about dedicated unmanned aircraft hull (physical damage) and liability coverages available through AIG Aerospace.

**LEARN MORE ABOUT LEXINGTON INSURANCE COMPANY'S**

# POTENTIAL LEGAL ISSUES FOR UAVS

- ▶ Privacy Rights under Federal Law
  - ▶ 4<sup>th</sup> AmendmentJurisprudence provides for reasonable expectation of privacy for persons
- ▶ Jurisprudence
  - ▶ Dow Chemical (1986)
    - ▶ Okay to use aerial surveillance
  - ▶ California v. Ciraolo (1986)
    - ▶ Public interest in “plain view” from navigable airspace 1000 feet
  - ▶ Florida v. Riley (1989)
    - ▶ Public interest in view from 400 feet considered to be navigable airspace for heliporter
- ▶ Privacy in emissions and effluent?
  - ▶ Riverdale Mills Corp. v. Pimpare, 392 F. 3d 55, 64(1<sup>st</sup>. Cir. 2004)

## Be Ready for an Aerial Inspection of Your Farm

Source: Coalition to Support Iowa's Farmers

May 6, 2013



EMAIL



SHARE



Tweet



+1



Recommend

10

COMMENTS 0

### RELATED MEDIA



[Taking Health Precautions at Upcoming Swine Shows](#)

[EPA on the Hot Seat for Releasing Sensitive Ag Data](#)

[Free Training Sessions Offered to Iowa Pork Producers](#)



Photo by Charles Johnson.

If the thought of officials from the Environmental Protection Agency (EPA) flying over your farm makes you nervous, now is the time to get your questions answered and fix any potential problems. Both the Iowa Department of Natural Resource (DNR) and the EPA have indicated they will be doing inspections of livestock and poultry farms around the state, including on-site inspections, aerial surveillance and computer-based inspections (i.e. looking at the images on Google Earth and other Web sites with aerial images), says the Coalition to Support Iowa's Farmers (CSIF).

# POTENTIAL LEGAL ISSUES

- ▶ State laws on UAV operations





# STATE LAWS WITH IMPLICATION FOR ENVIRONMENTAL MONITORING

- ▶ Most laws have no mention of anything explicitly or implicitly that involves environmental monitoring
- ▶ Texas Privacy Act
  - ▶ Texas law provides an explicit exemption for images that are captured by state law enforcement officers for the purpose of “conducting routine air quality sampling and monitoring, as provided by state or local law.”
  - ▶ Sec. 423.002 (9)(C)
- ▶ Tennessee Code
  - ▶ Same language as Texas Privacy Act Sec. 39-13-902 (a)(8)(C)

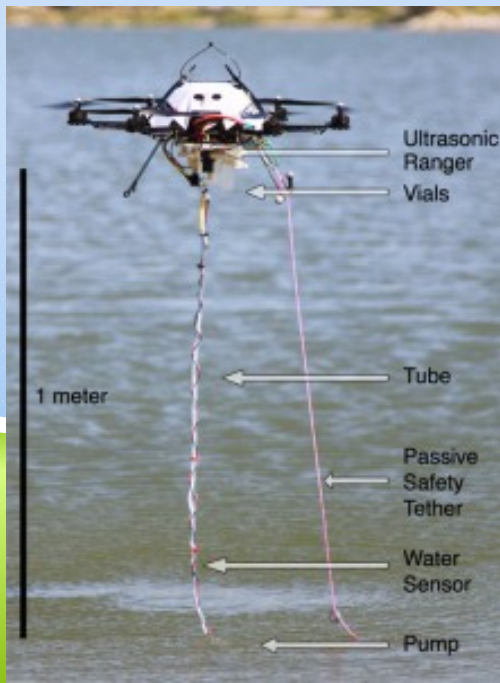
# EXAMPLES OF STATE LAWS

- ▶ Issue with variety of State law- What will the relationship of these State laws be with federal laws?
- ▶ Some of the State laws are quite restrictive such as the Idaho State law
  - ▶ no state agency may “gather evidence or collect information about... a farm, dairy, ranch or other agricultural industry without the written consent of the owner of such farm, dairy, ranch or other agricultural industry.” If a warrant or written consent is not obtained then the State agency may be subject to a minimum of \$1000 of civil liability.  
Idaho Code 21-213(2)(a)(ii)
  - ▶ Exception for “resource management”



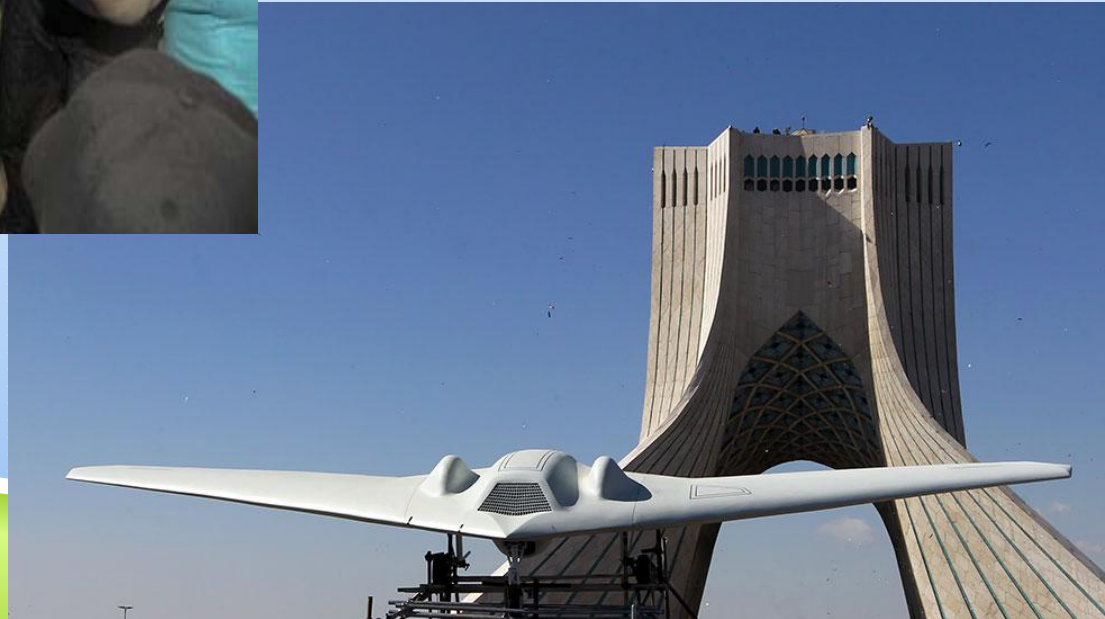
# POTENTIAL LEGAL ISSUES

- ▶ Aerial Trespass and Nuisance
  - ▶ Uniform State Aeronautics Law (drafted in the 1930s)
    - ▶ “[t]he ownership of the space above the lands and waters of this state is declared to be vested in the several owners of the surface beneath, subject to the right of flight.”
  - ▶ Landing an airplane without permission is prohibited without consent





# RARE LEGAL ISSUES: MALICIOUS DESTRUCTION AND HIJACKING



# MAINSTREAMING A UAV ENVIRONMENTAL MONITORING PROGRAM

- ▶ Work with entities that offer consent to monitoring via UAVs in order to reduce inspection visits
- ▶ Use the cost-savings from these cooperative UAV inspect visits as a justification for requesting environmental exemptions from non-safety related UAV regulatory legislation ( see e.g. Texas Law)



# RECOMMENDATIONS

- ▶ 1) Agency should developed awareness of the product risk associated with deploying UAV and carry appropriate levels of insurance to protect against potential injuries to property or persons caused by either a malfunctioning UAV or a negligently operated UAV.
- ▶ 2) Environmental agencies should request state legislators to be more explicit about the application of UAV legislation to routine environmental monitoring programs that would otherwise be conducted by inspectors.
- ▶ 3) Environmental agencies should also request state legislators to be explicit in their legislation about the extent of airspace rights for private entities and any public exceptions that might exist to that right.
- ▶ 4) Environmental agencies should request both federal and state lawmakers and regulators to be as clear as possible about the relationship between federal and state laws.
- ▶ 5) Finally, environmental agencies who are designing UAV based environmental monitoring programs should be explicit about how they will be protecting constitutional derived privacy interests.



# EUROPEAN AVIATION SAFETY AGENCY

- ▶ **Open-** Designed to allow simple operations and to allow small and medium sized businesses to gain experience. Regulated by local police like automobiles.
- ▶ Aviation authorities will have no involvement in these operations, even for commercial operations.
- ▶ No airworthiness approvals or licenses for operators or pilots.
- ▶ Must be flown within direct visual line of sight of the operator, at an altitude not to exceed 150 meters above the ground or water, and outside of specified areas (such as airports, areas protected for environmental purposes, or areas like military installations that are cordoned off for security purposes)
  
- ▶ **Specific**
- ▶ This category is for those operations that pose significant aviation risks to persons on the ground or which involve sharing airspace.
- ▶ Operations can be approved by national aviation authorities or by a specially approved organization known as an accrediting body.
- ▶ The minimum level of safety for airworthiness. UAV may need to be certified, or specific safety devices may be required by the approval authority. Trained operator
  
- ▶ **Certified**
- ▶ This category will be required for operations that pose aviation risks akin to normal manned aviation operations. Type certificates may be required that deal with matters such as airworthiness, noise, capabilities, etc. Pilots must be licensed.

# THE FUTURE IS HERE BUT ARE WE READY?

- ▶ 60% of people surveyed by INTEL said UAVs "are a smart and sensible way to improve public services" like law enforcement, firefighting and general public-safety monitoring.
- ▶ But is our legal landscape ready?

