Advanced Monitoring and Information Gathering for Environmental Compliance:
Property, Privacy and Evidentiary Issues

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Topics

- Property Rights, Privacy and evidential issues in relation to:
  - Advanced surveillance and the use of Drones/UAVs (unmanned aerial vehicles) /RPASs (remotely piloted aircraft systems) – primary focus
  - Increasing sophistication in scientific analysis of pollution sources
  - Use of “Big Data”
Advanced RPAS surveillance

- Surveillance drones now avail for a few hundred $$
RPAS use

Search and rescue

Surveillance of unlawful hunters
Agricultural uses

Power line & pipeline checking
Deforestation in Amazon
Illegal forest clearance
Policing agricultural activities (EU)
Marine pollution
Infra red – air and water heating
Infra red – invasive species identification
Unique characteristics of RPASs

- Use of aerial surveillance and imagery not new
- But RPASs offer many advantages:
  - Cost – cheaper to operate, less fuel required than aircraft; Longer endurance
  - Can fly at lower height so higher resolution
  - On-demand and special tasking possible
  - Video capability for evidential purposes
  - Generate more data with greater accuracy and analytical potential from multiple synchronized platforms (“Big Data”):
Recent examples of use of “eco-drones”

- US Forest Service – early warning of forest fires
- US Dept of Ag & NASA – long endurance & higher altitude – research on forest fires in California
- WWF – illegal trade in endangered species/ivory in Africa
- Brazil govt. – deforestation in Amazon and illegal mining
- UN – REDD+ (reducing emissions from deforestation in developing countries)
- Ecosystem inventory and accounting incl. Soil erosion, species and habitat monitoring
- NOAA - Atmospheric monitoring; Arctic sea ice retreat
- China – monitoring landslip warning signs; soil erosion
- NASA – monitoring volcanic activity Central America
Property rights issues

- Common law “first principles”
  - *Cujus est solum ejus est usque ad coelum et ad inferos*
  - Trespass
  - Nuisance
  - Negligence (limited use for drones unless persons injured or property damaged)
Bernstein v Skyviews and General Ltd [1978] QB 479 at 488 per Griffiths J.

- The right of a landowner to sue for trespass into airspace above land, is normally “limited to such height as is necessary for the ordinary use and enjoyment of land and the structures on it.”

United States v. Causby, 328 U.S. 256 (1946) (USSC)

- A landowner owned “at least as much of the space above the ground as he can occupy or use in connection with the land.” If the government or any other party intrudes into that space, such intrusions should be treated “in the same category as invasions of the surface.”

- What height would impact on a landowner’s full enjoyment of their property? (Bernstein; Causby)

- 400 feet? 500 feet? 1000 feet?
Davies v Bennison (1927) 4 TLR 8 per Nicholls CJ:

“It seems an absurdity to say that if I fire at another’s animal on his land, hit it, kill it, and so leave the bullet in it, I have committed no trespass, and yet, if I miss the animal and so let the bullet fall into the ground, have committed a trespass. Such distinctions have no place in the science of the Common Law.”

“If the hovering aeroplane is perfected the logical outcome of Lord Ellenborough’s dictum [Pickering v Rudd (1815)] would be that a man might hover as long as he pleased at a yard, or foot, or an inch, above his neighbour’s soil, and not be a trespasser, yet if he should touch it for one second he would be.”

Ryder v Hall (1908) 27 NZLR 385 (CA) at 419 per Denniston J (passage of balloon or airship over land technically a trespass).
Nuisance

- Primary “environmental tort”
- Based on *sic utere tuo ut alienam non laedas* (use your own property so as not to damage another)
- Public nuisance
  - interference with reasonable comfort and convenience of citizens
  - may include interference with public right or use of a public place
- Private nuisance
  - an unreasonable interference with a person’s right to the use or enjoyment of an interest in land
  - Extends beyond direct physical intrusion and can include noise, vibration, and other intangible and consequential interferences
  - Breach of privacy as a ‘nuisance’?
Generally drones may not be flown over densely populated areas, restricted airspace, and if private must have special authorisation.

Otherwise no property rights limitation on overflight in public airspace (>1000 feet or 500 feet; 400 feet for model aircraft)

- *Florida v. Riley* (1989) - helicopter detecting marijuana plants through open roof of greenhouse (at 400 feet) not trespass
- *California v. Ciraolo* (1986) (USSC) – same result for fixed-wing aircraft in public airspace (1000 feet)
- *Dow Chemical Co. v. United States* (1986) (USSC) - photographing industrial complex from public airspace not a breach of Fourth Amendment & does not require warrant

Recently a number of States have restricted use of drones for surveillance – warrant is required
Civil aviation regulations - NZ

- Similar to many other jurisdictions

- Pilotless aircraft over 25 kg [Part 19 CA Rules Consol.]
  - Authorization of the Director of Civil Aviation required to operate pilotless aircraft (Rule 19.105, Part 19, CAA Transition Rules)
  - Authorization will contain rules and conditions of operation

- Pilotless aircraft 100g-25kg [Part 101 CA Rules Consol.]
  - Must remain in line of sight of operator
  - May not operate at night
  - May not create hazard to persons or property
  - May not drop any article
  - May not be operated in restricted, military, low flying zones, or controlled airspace
  - May not be operated within 4km of aerodrome or above 400 feet except in certain circumstances (notification requirements)
New regulations - NZ

- New proposed rules for Unmanned Aircraft operations (2015)
  - Higher level of training required for unmanned aircraft [>25kg]
  - Unmanned Aircraft Operator certification [New Part 102]
  - Over-the-horizon unmanned aircraft operations permitted on authorization by Director of CAA
  - Reflects increasing use of larger drones for many agricultural, industrial, environmental, and security-related monitoring and surveillance purposes
Property-based approach to regulating RPASs

- Gregory McNeal – “Drones and Aerial Surveillance: Considerations for legislators” (Brookings Institute, Nov 2014)
- Takes the view that blanket restrictions on drones is “overkill”
- Suggests property-based approach:
  - Landowners can restrict use of airspace up to 350 feet above property (resolves uncertainty of cases like Bernstein, Ciraolo, Riley etc);
  - Limitation on duration of surveillance: 60 minutes with Officer’s discretion; 1-48hrs requires Court Order & reasonable suspicion; >48 hours requires warrant and probable cause;
  - Data retention limitations: <30 days available to agents of Govt; 30-90 days info available only with Court Order & reasonable suspicion; >90 days – court order and probable cause required;
  - Transparency and accountability measures – publicly avail. Flight logs etc.
- Problem of “over the fence” surveillance from public places, neighboring properties, by private operators etc.
Privacy considerations

- Most common law jurisdictions have privacy protection and freedom of information legislation
- UAVs involve collection of vast swathes of information
- Public/private infrastructural arrangements
- Three main privacy concerns:
  - Boundaries of ‘personal information’ - Does information relate to “core” or just “extraneous” information about an individual – grey area; misuse of ‘mass surveillance’ under guise of ‘situational awareness’
  - Locational boundaries and appropriateness of UAV surveillance
  - Lack of awareness of surveillance – bypass of consent

Privacy

Regulation:
- Military and police forces often have exemptions in public interest
  - Is this a problem?
  - Achieving a balance between security demands and freedom of association, free speech, expectation of personal privacy and dignity etc

- Privacy laws limit collection, use, disclosure, retention and disposal of information about “identifiable individuals”

- Should public agencies do “privacy impact assessments”?

  - use of forward-looking infra red radar from public space to capture heat emissions from home not breach of privacy, BUT
  - If remote sensing revealed personal or core biographical detail or aspects of private life, habits etc, this would be “government search” and require warrant
Privacy – generic principles

- **Information Privacy Principles (NZ):**
  - Must be lawful purpose & necessary for that purpose;
  - Direct collection from individual (some exceptions, eg law enforcement);
  - Inform individual why info collected, who for, who has rights of access and why (some exceptions);
  - No unlawful, unfair, or unreasonably obtrusive collection;
  - Storage – security safeguards against loss, misuse etc;
  - Right of access by individual;
  - Right to correct by individual;
  - Accuracy to be checked before use;
  - Retention no longer than necessary for purpose collected;
  - May not use for other purposes;
  - May not disclose to third parties (some exceptions);
  - No assignment of ‘unique identifier’ (some exceptions).
Privacy – specific measures

- McNeal (Brookings paper) argues against blanket prohibition against drone surveillance without warrant.

- If warrant requirement remains – unlawfully acquired evidence should not automatically be excluded where the following might apply:
  - In non-trial proceedings such as, grand jury proceedings, preliminary hearings, bail hearings.
  - Good faith exception (*Massachusetts v. Sheppard* 468 U.S. 981 (1984)).
  - Independent source doctrine (*Murray v. United States* 487 U.S. 533 (1988)).
  - Inevitable discovery rule (*Nix v. Williams* 467 U.S. 431 (1984)).
  - Attenuation principles (*Wong Sun v. United States* 371 U.S. 471 (1963)).

- Definitions must be clear (e.g., ‘search’, ‘surveillance’, ‘private property’, ‘public place’), and legislation should specify what locations are entitled to privacy protection.
Increasing scientific certainty in evidentiary issues

- Ability to fingerprint discharges of pollutants to source
- Ship owner, manager and Master charged with pollution offences
  - Not conclusive, but can say the oil could have come from that vessel – more likely than not
  - Coupled with eyewitness accounts, location of slick, admissions etc, sufficient evidence to discharge burden
- Usually marine pollution offences are strict liability, and vicarious liability applies
  - No *mens rea* required; but *actus reus* needs to be proven “beyond reasonable doubt”
- In *Canterbury Regional Council v Pacific Marine* (2005) – ASTA and “Eurocrude” analysis techniques used - probability of oil from ship FV Ascold “nearly reaching certainty”
Chain of evidence issues (eg, oil pollution)

- Collection of evidence and samples – legitimacy; warrants
- Sampling timeframe – speed is of the essence
- Avoidance of cross-contamination – cleanliness of sampling equipment and protective equipment
- Identification of samples – sealing; labelling; verification by independent person
- Security of evidence; chain of custody – accurate records and verification; prepared to give affidavit
- Storage of evidence – optimal temperature, light, humidity; security and accurate records
- Laboratory analysis – accredited laboratory; qualified analyst
“Big Data” implications

- “Big data” - Using information technology to analyze large amounts of raw data from dispersed sources
- Environmental protection uses include (ELI paper):
  - Atmospheric emissions of pollutants
  - Improving energy efficiency
  - Promoting environmental justice
  - Tracking climate change, and
  - Monitoring water quality
“Big Data” implications

- Who is using Big Data (ELI paper)?

  - US Federal Agencies:
    - EPA; DoI; DoE; NOAA; NWS; USPS; NASA

  - State & local governments:
    - Water supply; air quality; traffic management; electricity management; biodiversity; planning & strategy

  - Environmental organizations:
    - Deforestation, energy efficiency, biodiversity, endangered species, environmental crime, and ecosystems changes (UN; WRI; IUCN; GFW; Natural Resources Defense Council; National Ecological Observatory Group; Envir. Investigation Agency; Tropical Ecology Assessment & Monitoring Netwk)

- Crowd sourcing & citizen science

- Private sector: IBM; Microsoft; Airlines; Energy companies; building efficiency; large-scale manufacturing; farm performance; resource use; timber harvesting
“Big Data” implications

- Christchurch – “Sensing city” – opportunity for new city following earthquake rebuild to incorporate sensors for many environmental purposes
  - Sensing City in four minutes: vimeo.com/75365337
- George Orwell was right!
  - https://www.youtube.com/watch?v=RNJI9EEcsoE