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

Agricultural uses

Power line & pipeline checking

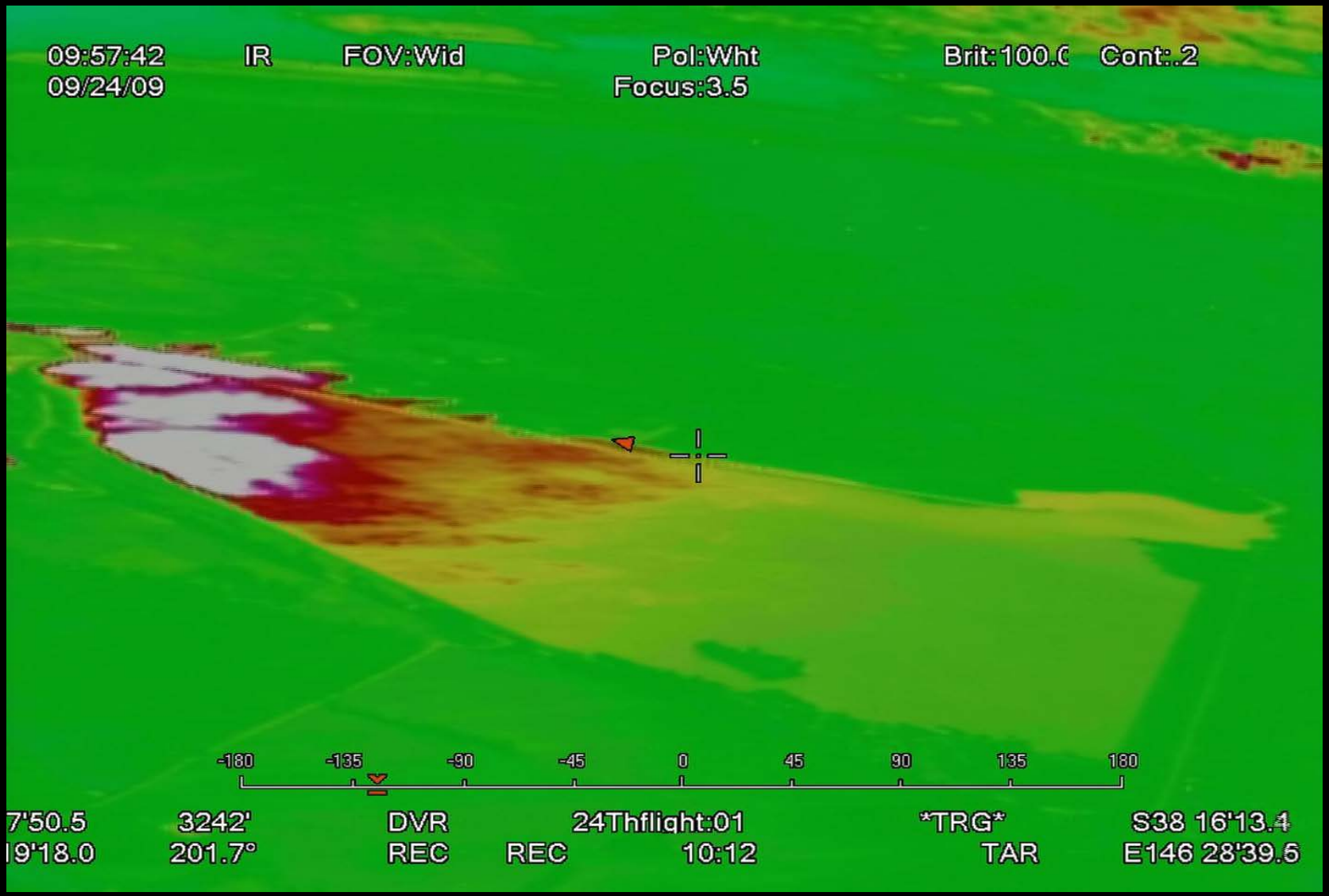

Deforestation in Amazon


Illegal forest clearance

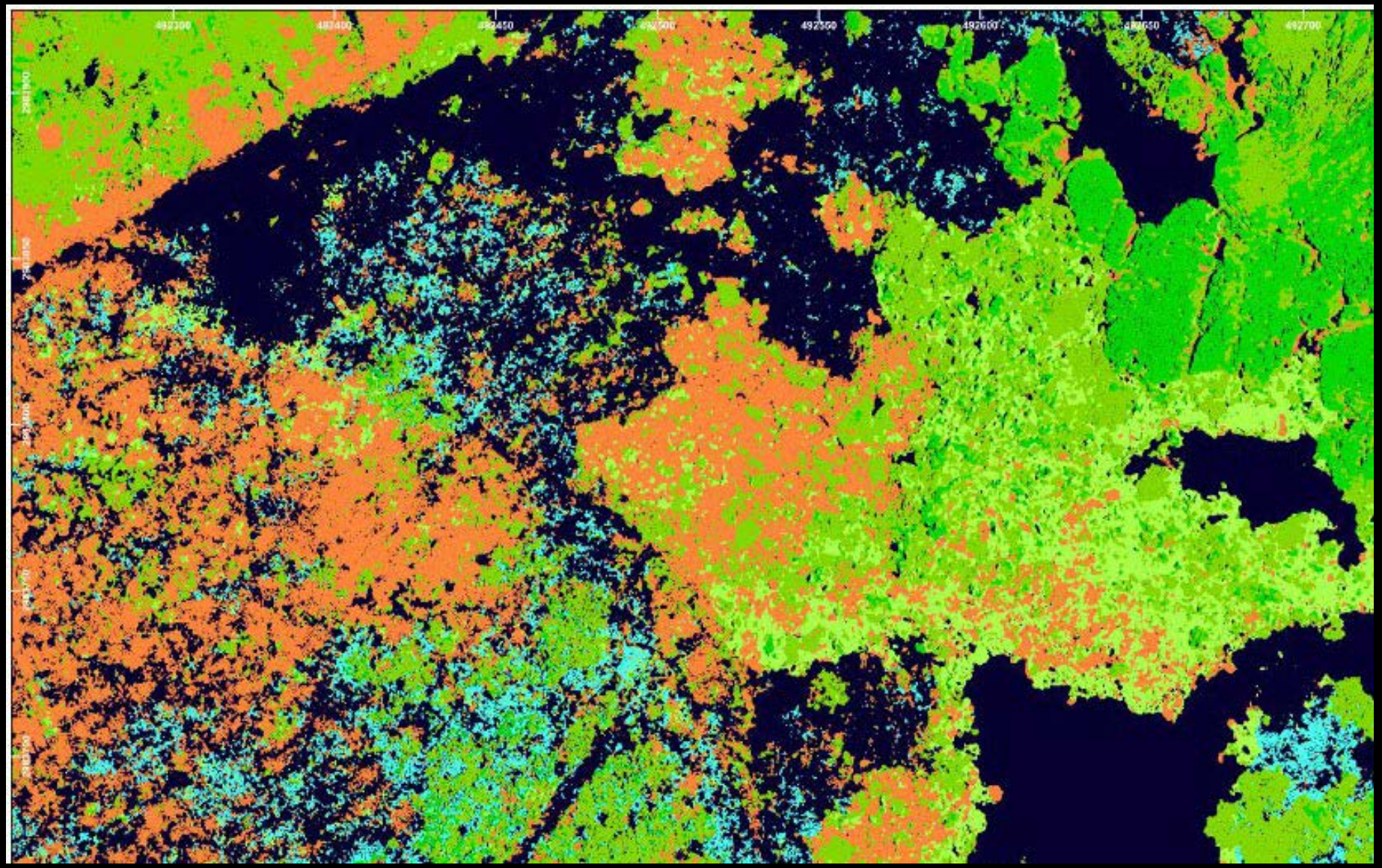
Policing agricultural activities (EU)

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”):
    - http://phys.org/news/2012-02-airborne-robot-swarms-complex-video.html

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 perdsons injured or property damaged)

Trespass

- *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?

Trespass

- *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’?

Civil aviation regulations - US

- 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.

Gregory McNeal – "Drones and Aerial Surveillance: Considerations for legislators" (Brookings Institute, Nov 2014) at 14.

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

Ref: Environmental Law Institute, “Big Data and Environmental Protection: An Initial Survey of Public & Private Initiatives” (2014)

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”?
  - *R v Tessling* (2004) SCC 67
    - 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 (eg, ‘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
- *Thallasic Steamship Co case (2000) (NZ)* (ship *Themera* discharging "Santa Cruz Crude" in harbour)
- Ship owner, manager and Master charged with pollution offences
  - ASTM Standard Practice for Oil Spill Identification by Gas Chromatography and Positive Iron Electron Impact Low Resolution Mass Spectrometer
  - 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

- NZ Data Futures Forum, *New Zealand's Data Future: Discussion Paper* (2014)
- 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=RNJl9EEcsoE