

# Real-time Monitoring and Water Regulation: Enhancing compliance and enforcement through Audited Self- Management

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# Outline

- Context
  - regulation, agriculture and water
  - coregulation, monitoring and disclosure
- Methods
- ASM in practice
- Lessons



# Regulation

- how best to achieve C&E within resource constraints
  - *where* to allocate resources e.g. risk based approach (Sparrow 2000)
  - *how* to intervene e.g. education, inspection, tit-for-tat (Braithwaite 2011; Kagan 2003)
  - *who* should intervene – government, regulated, NGOs (Gunningham et al 1998)
  - *why* intervene - education, reward virtuous behaviour, deterrence (Bentham 1789; Ayres and Braithwaite 1992)
- few strategies applicable across all sectors/actors
- more work to be done (Gunningham 2011; Paddock et al 2012)
  - the who: advanced monitoring, information gathering and diffusion through co-regulation (regulated, third party, government)

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- Agriculture is the largest user of water but...
  - political power, geographical isolation and the primacy of private property rights
    - not been subjected to the same degree of regulatory intrusion as manufacturing and mining (Gunningham and Sinclair 2002; Holley and Sinclair 2011; Hudspith 2012)
    - monitoring is patchy, old, high errors, tampering
    - presumption is engage with agricultural community: buy-in, stewardship, resources
  - extensive reforms and interventions over 20 years (Hussey and Dovers 2007; Holley and Sinclair 2011)

# New Zealand & Regulation

- New Zealand has the highest growth rate in irrigation of any OECD country
- RMA - consents to take fresh water
- ~20,000 consented takes – 15,000 for irrigation
- As of 2010 - only one-third of consented takes were currently measured (Ecan 2010)

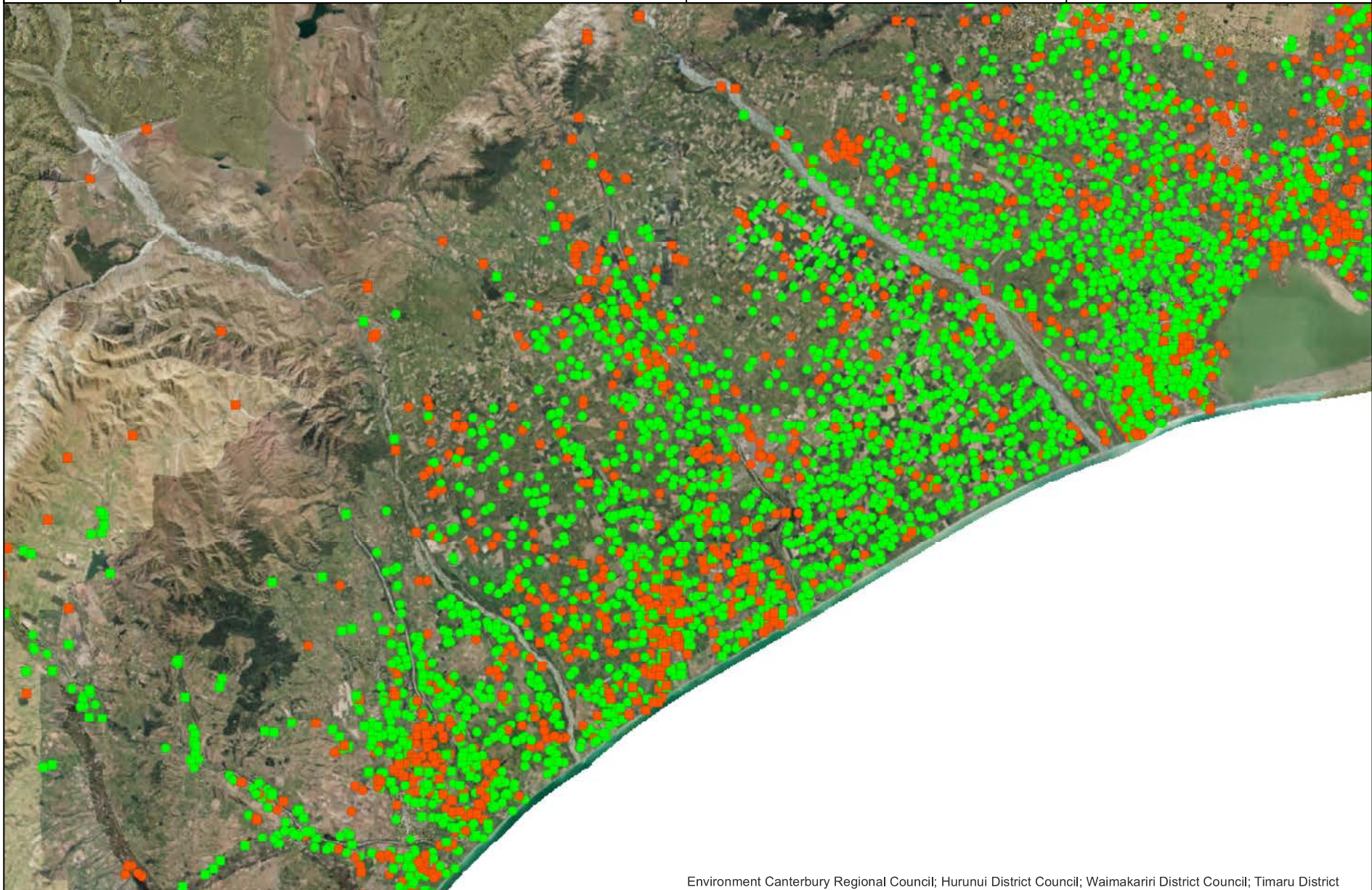


# Regulatory Reform

- Resource consents allowing fresh water to be taken = or >5 litres (1.3 gallons) per second must:
  - use a water measuring device/provide annual records
  - timed introduction for existing consents – 2-4 years depending on rate of take (Ecan 2010; RMMRWTR 2010)
- Regulations set bottom line (+-5 to 10% error; annual reporting; verified every 5 years)
- Councils can add more stringent requirements (telemetry, data-logger, <5lps)



(Ecan 2010)



# Canterbury



- 70% of New Zealand's irrigated land, ~5,000 consents need new meters
- sustainability limits of water availability reached and water quality compromised
- 'Non binding' regional water management strategy (CWMS)
  - have regard to vision and principles in decision making
  - sets out vision of institutional arrangements involving ASM



# Audited Self Management

- transfer day-to-day management responsibility to users under agreed terms, subject to transparent audit (LWMMF 2012)
- variety of forms, but common characteristics:
  - water users form a legal entity/collective
  - entity allocated a water right for members as a whole
  - establish, with regulator, objectives for water quantity and quality
  - management system among collective, with regulatory backstop
  - monitoring, reporting and continuous improvement of performance
  - telemetry/real time data and independent third party auditing



# ASM

- enable the reduction in compliance costs, with compliance action targeted on a minority of non-complying water users
- encourage farmers to monitor and improve their own performance and demonstrate their cumulative environmental effects meet acceptable limits (CWMS 2010, 6, 14, 43, 54,130)
- co-regulatory model (echoing self management, reflexive law/process based regulation) (Ostrom 1990; Blomquist 1992; Orts 1995; Gunningham and Sinclair 2002)

# Methods

- Two case studies selected to provide a range of circumstances (e.g. size; number of agricultural water users)
  - 2 case studies
  - Eiffelton (12 farmers, existing irrigation scheme, groundwater pumped into channels)
  - Opuha Dam (220 farmers, dam, river as delivery channel into aquifers)
- 28 interviews (a representative sample of irrigators, government and relevant stakeholders involved in ASM pilots)



# ASM Strengths

- Strong support/interest in ASM from farmers and regulators
  - “industry are excited because they see it as way to stave off regulation and to put themselves in a better position economic wise, while regulators see it as away to devolve responsibilities to other bodies”
- Economic benefits for farmers
  - “we can do more together than individually” (e.g. bulk technology purchase)
  - “we can smooth out the bumps by pooling our water... letting croppers pump extra around Christmas and dairy farmers extra around winter, you know, getting that bit extra when they really need it”
- Improved management, buy-in/stewardship
  - “its shifting minds away from complying with licences or consents to encouraging ownership of the water, so its no longer the government’s water but its our water, our group owns it and if an individual takes water he is taking our water”

# Strengths

**‘Soft’ Controls** - “every member can go in and see what their neighbours are doing and if they go over their entitlements we get very angry...its absolute transparency. The system takes away the risk of abuse”

**Protected by a Safety Net** - “the collective don’t see themselves as the policeman, but you’ll get spanked a few times by your peers and if that doesn’t work then the regulator takes over”



# Strengths

**Resources:** “if we [the regulator] had gone and done the work of monitoring it would have cost a 1000 hours of our time. Now with the collective providing the data via telemetry it might only cost 50 hours”

**Responsiveness** - “its fundamental that they have telemetry. You need to be able to see in real time what your water level is and what its impacts are... it also allows you to take quick action and prevent further breaches by responding as they happen rather than on an annual basis”



# Challenges

- Up front costs for farmers
- Wider applicability
  - capacity/skills of farmers
  - “moving beyond existing irrigation schemes is limited. You got to have a shared source of water”
  - “ASM works best where people want to be in it and they see a benefit. It’s a waste of time as a regulator trying to get people involved if they don’t give a stuff”
  - Size matters



# Challenges

- Legitimacy with wider stakeholders (ENGOS)
  - “They see it as putting the fox in charge of the hen house”
- Auditors (independence, capacity, auditing of auditors)
  - “Any third party will have their own agenda or be paid by certain people. The [regulator] is still responsible for the environment and they have to make sure auditors do their job... otherwise you get cosmetic compliance”





# Technology & Co-regulation

Conditions likely to increase success of co-regulatory model in agricultural contexts:

- Smaller size/scale
- Farmers see a benefit (ownership)
- Supportive government (devolution)
- Regulatory incentives
- Existing organizational structure
- Requirements for detailed monitoring system

(Ostrom 1990)

# Technology & Co-regulation

- Funding/incentives for monitoring technologies
- Funding and training for farmers (e.g. reduce transaction costs)
- Enhance diffusion - engaging NGOs and other key stakeholders

# Images

- <http://www.marlborough.govt.nz/Environment/Water-Metering.aspx>
- <http://www.deeco.co.nz/gsmgprs-data-logger-commcell4/>
- <http://www.hbrc.govt.nz/Services/Environment/Pages/Water-Metering.aspx>
- <http://ecan.govt.nz/advice/your-water/water-metering/Pages/smart-system.aspx>
- <https://adorablyobnoxious.wordpress.com/2014/04/26/daily-prompt-the-wanderer/>