Same problems – Different approaches
Better outcome?

A comparison of water quality regulation and management in Vermont and New Zealand

William “Breck” Bowden
Rubenstein School of Environment and Natural Resources
University of Vermont

Vermont Environmental Consortium
Panel on Innovative Approaches to Water Quality Management from Agricultural Activities

Vermont Technical College
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Why compare VT and NZ?
Some things are different
Number of cows and production

Vermont

New Zealand

http://www.fao.org Country pasture/forage profiles


http://www.vsjf.org
Water Quality Concerns


Cyanobacteria blooms can produce harmful toxins, and should be avoided by swimmers and pets. Photo: Québec MDDEP. From LCBP State of the Lake (2012)
Agriculture in New Zealand

• Agriculture is key sector of NZ’s economy
  o ~5% of GDP excluding downstream processing
  o ~15% of GDP including downstream processing
• Growing intensive pastoral farming, mostly dairy
• Key source of environmental impacts
  o GHG emissions & carbon sequestration
  o Nutrient runoff

• In contrast to US
  o Dominance of pastoral agriculture
  o No agricultural subsidies (abandoned in 1984)
  o Willingness to regulate agriculture
New Zealand’s Policy Environment

• National government
  o Responsible for high-level policy & legislation
  o Stakeholder driven (lobbyist internalized?)
  o Resource Management Act (1991) devolved most environmental management to regional councils

• Regional government
  o Responsible for land, coastal area, river & lake beds, water, discharges, noise
  o 16 regional councils in NZ – all with different approaches

• Local government
  o Responsible for land-use zoning
Water Quality Regulation

• Regulating agricultural water quality impacts is a reality
  o Lake Taupo Watershed
  o Rotorua Lakes

• Other regions moving to regulate agricultural nutrient discharge
  o Canterbury
  o Southland
  o Otago
  o Horizons
Lake Taupo Watershed (North Island)

Thanks to Suzie Greenhalgh
Landcare Research NZ
Background: Lake Taupo

• Lake clarity had decreased from 16 to 14 m
• Estimated that 20% reduction in manageable N lake inputs to lake was needed to maintain quality at 2001 levels
  
• To be achieved by
  o Controlling current leaching N to 2001 levels with a N trading program
  o Permanently reduce N input by 20%
  o Establish a Public Trust with $81 million funding to reduce N
Contested policy/design issues

• Controlled vs permitted activity
• Initial size of cap too small
• Maori concerns about resource management
• Allocation mechanism
  o Grandfathering chosen
  o Highest leaching year (2001-2004) for benchmark

• Credibility of bio-physical modelling to estimate farm N losses (OVERSEER)
Status of Trading Program

• ~97% of farms have been evaluated for a nutrient discharge allowance (NDA = TMDL at farm level)
• ~70% of farms have consents (nutrient plans)
• 26 trades have occurred
  o 19 Lake Taupo Protection Trust (LTPT): require permanent reductions
  o 7 with dairy farmers
• Nitrogen traded
  o 120,000 kg N to LTPT
  o 18,000 kg N to dairy farmer
Cost of Trading Program

• Trading prices
  o Permanent reductions ($350 - $400/kgN)
  o Leased temporary reductions ($25/kgN)

• Transaction costs:
  o $1000-$1500 to modify consent/party
  o cost of implementing change

• “... a statement of intent and framework for actions to promote sustainable dairy farming in New Zealand. It focuses on reducing the impacts of dairying on the quality of New Zealand streams, rivers, lakes, ground water and wetlands.”
THE DAIRYING AND CLEAN STREAMS ACCORD: SNAPSHOT OF PROGRESS 2011/2012
Criticisms

New Zealand Fish and Game
New Zealand Forest and Bird

• does not focus on measurable improvements in water quality
• lack of independent auditing of the self-reporting by farmers
• a failure to meet the principal targets
• inconsistency in reporting progress
• use of incorrect measures in the progress reports
• has not improved water quality

Deans and Hackwell (2008)
The Tale of Two Accords: Clean Streams vs Forests

• Inclusion of major stakeholders
  • CSA: dairy industry and central government only
  • FA: included all of the main players including NGOs, recreation, fishing, etc.

• Use of voluntary regulation by the industry
  • CSA: as a means to thwart additional regulation
  • FA: as a means to define additional regulation

• Effectiveness of the accord
  • CSA: has not actually cleaned water
  • FA: has protected native and commercial forest interests

Deans and Hackwell (2008)
Which way to go?

• It is clear that we are both (all) still struggling

• Some keys to success
  o Broad inclusion of stakeholders
  o Respect of positions of “opponents”
  o Science-based decision tools
    ✓ Easily understood
    ✓ Easily used
    ✓ Widely adopted
  o Strategic regulation that respects all positions
  o Pragmatic compromise that respects all positions
  o Substantial resources to support BMPs
  o Achievable, effective, and measureable performance targets
The End Game

A productive working landscape in a protected natural environment

Photo credit: Apple Island Resort, VT

Photo credit: Kiwiwise, NZ
Thank you!

Breck Bowden

breck.bowden@uvm.edu

http://www.uvm.edu/~wbowden
### Historical Regulation

<table>
<thead>
<tr>
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<th>New Zealand</th>
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<tbody>
<tr>
<td>• Accepted Agriculture Practices (AAPs) adopted in 1995</td>
<td>• Resource Management Act 1991</td>
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<tr>
<td>• Large Farm Operation Program (1995)</td>
<td>○ designates water as managed by regional councils (no freshwater policy statement)</td>
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<tr>
<td>• Medium Farm Operations General Permit (2007)</td>
<td>○ sets water quality standards and guidelines for use</td>
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<tr>
<td>• LFO and MFO are result of Clean Water Act</td>
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Credit: Courtney Hammond (UVM)
# Farm-Scale Management - Current

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<td>• AAPs required by all farms (animal waste management, erosion, sediment control, buffer zones, fertilizer and pesticide management)</td>
<td>• Restrictions on taking water and discharging contaminants into water, must be approved through Resource Consents (like permits)</td>
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<td>• MFO requires no direct discharge into waters and a nutrient management plan (NMP)</td>
<td>• Reducing impact of farms on waterways primarily voluntary (BMPs)</td>
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<tr>
<td>• LFO requires adequate waste management, no direct discharge into waters, NMP, and may require Best Management Practices (BMP)</td>
<td>• OVERSEER (free software) used to inform nutrient management plans (voluntary)</td>
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<tr>
<td>• BMP Program – voluntary cost share program for implementing BMPs</td>
<td>• Voluntary agreement between Fronterra Co-op, regional councils, and ministries for environment and for agriculture and forestry – kept cattle out of streams, lakes and wetlands, treated farm effluent, controlled use of fertilizers</td>
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Credit: Courtney Hammond (UVM)
Compliance, Management, and Monitoring

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<td>• AAPs minimally enforced for small farms</td>
<td>• Consents are given by regional councils and compliance is monitored</td>
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<tr>
<td>• MFO &amp; LFO programs have focused on incentivizing changes through BMP program and less on enforcement</td>
<td>• Compliance is defined by “good management practices (GMPs)”</td>
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Credit: Courtney Hammond (UVM)
## Emerging Regulatory Context

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<td><strong>Under H-35 and new TMDL:</strong></td>
<td>• Freshwater Management National Policy Statement (2011 &amp; 2014)</td>
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<tr>
<td>• AAPs become RAPs (Required agricultural practices) – NMPs required by all farms</td>
<td>• Set freshwater quality limits on all freshwater units by 2025</td>
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<td>• Small farm require Small Farm Certification</td>
<td>o collaborative or consultative planning processes</td>
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<td>• New fees for MFO and LFO permits</td>
<td>o Use OVERSEER to set regional budgets</td>
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<tr>
<td>• More staff to ramp up enforcement (regular compliance checks for all farms rather than complaint-based)</td>
<td>o Most likely require updated resource consents and implementation of Good management practices (GMPs)</td>
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<td></td>
<td>• Sustainable Dairying: Water Accord (2013)</td>
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