Engaging People in
Integrated Catchment Management:
the Motueka experience

Andrew Fenemor
Landcare Research, Nelson, New Zealand

with thanks to scientists, stakeholders, and colleagues in ICM research

NZ Landcare Trust
Common Ground Associates Ltd
Motueka Iwi Resource Management
Komiti (MIRMAK)

SCIENCE MAKING A DIFFERENCE FOR A TRULY CLEAN, GREEN SUSTAINABLE NEW ZEALAND
Improving the level & quality of interactions between science providers & end-users

<table>
<thead>
<tr>
<th>Problem context for science</th>
<th>Supporting approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production</strong></td>
<td>Single stakeholder consultation</td>
</tr>
<tr>
<td>1970’s</td>
<td>- ask clients about needs</td>
</tr>
<tr>
<td>- Enterprise or single sector goals</td>
<td></td>
</tr>
<tr>
<td>- few stakeholders</td>
<td></td>
</tr>
<tr>
<td>- success measured by economics/production</td>
<td></td>
</tr>
<tr>
<td>1990’s</td>
<td>Multi-stakeholder participatory</td>
</tr>
<tr>
<td>- multiple goals</td>
<td></td>
</tr>
<tr>
<td>- many stakeholders</td>
<td></td>
</tr>
<tr>
<td>- success measured in terms of ecological health &amp; equity</td>
<td></td>
</tr>
</tbody>
</table>

| **Sustainability**          |
| 1990’s                      |
| - collaborative learning    |
| - shared understanding     |
| - change oriented           |
| - designing NEW systems     |

* Courtesy of Will Allen and Margaret Kilvington (2000)*
Integrated Catchment Management

...a partnership approach
ICM for the Motueka

The Motueka catchment, NZ
Motueka Catchment

• 2170 km² from sea level to 1600m elevation
• Cool humid climate with rainfall 1200-4000 mm/yr
• Mean catchment flow 82 m³/s (1187mm/yr)
• Alluvial & Tertiary aquifers used for irrigation
• Geology: clay → erodible granite → ultramafic → karst
• Land uses: grazing, dairy, horticulture, pine forestry, National Park
• Brown trout fishery attracts tourism
• Scallops, mussels, aquaculture offshore
• Population ~ 12000 growing at 2% per year
ICM as a process:
2003-2009 research objectives (4)

**Inheritance**
- Iwi values & collaboration
- Collaborative learning
- Science Responsiveness

**Knowledge Management**
- Knowledge base
- Institutional learning

**Catchment Connections**
- Groundwater flowpaths
- Sediment sources, transport & impacts
- Riverine Effects on coastal productivity

**Tools for Management**
- Resource allocation and economics
- Sediment impact mitigation
- Residual flow needs assessment
- Riparian Classification and Restoration

**Visualising Futures - IDEAS**
- IDEAS cumulative effects modelling concept
- Hydrological & contaminant transport model
- Stream habitat model
- Coastal circulation & ecosystem model
- Sediment generation model
- Ecosystem services model

**Policy Development & Community Action**
(Council, sector and community roles)

- Science
- Council
- Communities

*Legacy*
The Motueka is a UNESCO ‘HELP’ Catchment

HELP = Hydrology for the Environment, Life and Policy

**Problem**

- Availability of water and groundwater resources and their use
- Lack of knowledge and inability of management to control resources
- Need for action to protect and improve the environment

**Activities**

- Monitoring the characteristics and dynamics of shallow groundwater in perplexed valleys
- Characterisation of riparian and streamside areas
- Assessment of factors controlling fish habitat, water and productivity
- Exploration of environmental knowledge needed for management of catchments

**Results**

- Establishment of an integrated Catchment Management Plan
- Determination of water quantity and quality
- Knowledge of the consequences of the combined impact of land use and management and the ecological environment

**Development**

- Model computer models of land use and change impacts
- Ecological assessment of the status of fish and water
- Value of groundwater and ecosystem productivity
- Identification of key information needs for integrated management and decision support

Real people, real catchments, real answers
Institutional Setting
New Zealand Water Management

- Government sets broad environmental policy only
- 16 regional & unitary councils = environmental management of land, water, rivers, air, coasts
- 70 district & city councils = water supply, sewerage, roading, land subdivision and land use planning
- Research = Crown research organisations, private research institutes & universities, with much environmental research funded by Government
Legislative Setting
New Zealand Water Management

- Resource Management Act 1991 governs all environmental management:
  “To promote the sustainable management of natural and physical resources”

- Councils manage the environment through:
  
  ✓ statutory regional and district plans
  ✓ granting resource consents for some uses of land, water, rivers, coast, and for discharges
  ✓ environmental education
Different Players in ICM

- ICM research
- Regional & District councils
- NZ Landcare Trust
- Landowners & resource users
- Maori
- Government
- Interest groups
- NGOs

Integrated Catchment Management

Awareness
- Knowledge

Resourcing
- Commitment

Actions
- Cumulative Benefits

Making a difference for a truly clean green New Zealand

Maaraaki Whenua
Landcare Research
Iwi Role in ICM

Examples:

• Assessment of iwi environmental monitoring approaches:
  – Cultural impact assessment
  – Contaminated site monitoring protocols
  – Maori indicators – e.g. *kaitiakitanga* (stewardship)
  – ICM monitoring techniques for iwi

• Collaborative learning guidelines for communities including iwi groups

• Develop Iwi Information Systems for environmental management
Engaging People in Motueka ICM

Four stories….
Story #1

Stakeholder input in setting ICM research priorities
ICM as a process

A trigger event

CONTEXT, KNOWLEDGE AND CULTURE
- Identify communities of interest and most congruent catchment scale

UPDATE CONTEXT, KNOWLEDGE & CULTURE

Issues definition:
- (methods including visioning, SWOT, PSR etc)

Attributes
- Holism (catchment scale)
- Integrates environment, economics, social (TBL)
- Cumulative impacts
- Sustainability target

Knowledge assembly & interpretation

Identify knowledge gaps (researchable)

Research & monitoring
- (with indicators)

Awareness-
- Prioritising actions
- Planning

Actions
- on the ground
- policy development
- (need champions for change)

Monitoring & realignment
‘Big Picture’ Issues for Motueka ICM Research

- Water allocation (incl. in and out-of-stream uses)
- Sedimentation risks (incl. river gravel)
- Aquaculture space allocation (incl. river impacts)
- Growth pressures (what’s sustainable?)

Detailed research issues and questions
Motueka Stakeholder Questionnaire: Their Top 5 Issues

1. River Water and Groundwater Availability
2. Groundwater Pumping Effects on Stream and River Flows
3. Methods to Resolve Competing Demands on Resources, e.g. Water, Coastal Space
4. River Gravel Supply and Extraction Effects
5. Environmental Effects of Increased Water Takes
Story #2

Negotiation of the Motueka Water Conservation Order
to linking science and management

A pathway for collaboration and adaptive management

understanding ideas design implementation

Science Management

Shared understanding

Multi-stakeholder dialogue

Information pool Agreeing to work collaboratively

science knowledge research

For more information:
Collaborative Learning for Environmental Management http://social.landcareresearch.co.nz
**News**

**Water order praised**

Fourteen years of negotiation over

**By Bernadette Cooney**

A decision to place a water conservation order on parts of the Motueka River has been applauded by Nelson Marlborough Fish and Game.

The order, gazetted by Environment Minister Marian Hobbs, places restrictions on damming and altering river flows and sets water extraction limits for irrigators.

The original application for the order was made in 1990 by the Nelson Arclimatisation Society, now known as Nelson Marlborough Fish and Game.

The former manager of the society, Mac Ward, said from Auckland today he was pleased to hear the order had finally been gazetted after 14 years of negotiation.

"There's quite a level of personal satisfaction in seeing this come to pass," he said.

"I congratulate Fish and Game and Nelson anglers for their dedication and ability to work through the issues, which certainly created a lot of misunderstanding early on. People thought we wanted to lock the river up and throw away the key."

Current Nelson Marlborough Fish and Game manager Neil Deans also welcomed the order, which he said would provide sustainable long-term water management.

However, he expressed disappointment that the order could be subject to review, as had happened with the water conservation order on the Gowan River.

Nelson Federated Farmers policy manager Lewis Metcalfe said primary producers now had many assurances over access to a reasonable level of water flow for irrigation.

"Water is vital for the primary sector and the socio-economic wellbeing of the community. However, a balance had to be found between primary sector demands and the environment, and this is what has occurred," Mr Metcalfe said.

Ms Hobbs said the order would allow parts of the river to be kept in its natural state.

"The Motueka River has many outstanding characteristics, including the scientifically important koura geological formation, blue duck habitats and brown trout fisheries," she said.

"It is important that these characteristics and the river's other natural features are protected by the conservation order."
Extraction Limit vs Standard Rationing Steps for Flows down to Woodstock

- Adopted allocation limit 1000 l/sec
- 12% extractable flow limit
- Step 1 rationing (20%)
- Step 2 (35%)
- Step 3 (50%)
Water Allocation Limits Adopted by TDC

<table>
<thead>
<tr>
<th>WATER MANAGEMENT ZONES</th>
<th>ALLOCATION LIMITS (litres per second)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Motueka Zone comprising</td>
<td>1000</td>
</tr>
<tr>
<td>Wangapeka</td>
<td>265</td>
</tr>
<tr>
<td>Motupiko</td>
<td>110</td>
</tr>
<tr>
<td>Tadmor (total augmented flow)</td>
<td>56</td>
</tr>
<tr>
<td>Tapawera Plains</td>
<td>515</td>
</tr>
</tbody>
</table>
Story #3
Science persuading farmers to improve water quality
Cows crossing streams

- 400% increase in *E.Coli* during cow crossings
- Cows 50x more likely to defecate in water
Bridges replace cow crossings

Bridge over troubled waters

Farmers and scientists join up to sweeten the Sherry River

While farmers are frequently criticised for the effects of dairying on the environment, positive developments are often ignored. Simon Towle reports on work along the Sherry River in Tasman District, where farmers have joined forces with scientists and the district council.
Story #4

Travelling River

... a collaboration of artists, scientists and the people of the Motueka River catchment
The Travelling River exhibition has been awarded the Tasman District Council’s Cultural Heritage Environmental Award, in recognition of the enormous contribution the exhibition has made to promoting the cultural heritage and environmental significance of the Motuoka River catchment.

The collection incorporated the work, vision and stories of artists, scientists, and the people of the Motuoka River Catchment in an innovative and accessible way, bringing the exhibition together drew all parts of the community into a discussion of what the river meant to them.

The beauty of the Travelling River art-science exhibition is that it crosses cultural and social boundaries, giving equal consideration to the thoughts and views of the many sectors of the Motuoka community.

We applaud the vision of Landcare Research and the exhibition creators Andrew Fenemor, Maggie Atkinson and Suze Peacock, in bringing alive life and science in the Motuoka River catchment. Therefore the Tasman District Council and judges of this category would like to congratulate all of the exhibition contributors, the many contributors to the project, including artists, scientists, we and the greater community for sharing what the Motuoka River Catchment has meant to them and how this compares with modern use and management.
8 Critical Success Factors for effective ICM dialogue (1)

1. A legal and institutional setting which facilitates resolution of the issues

2. Strategic planning to anticipate the issues, collect relevant information and initiate dialogue before the issue becomes a crisis

3. Vision, leadership and structure for the process

4. Involving all relevant stakeholder groups and engaging with stakeholder representatives who actually have decision-making power
8 Critical Success Factors for effective ICM dialogue (2)

5. **Adequate definition of the issue**, including issue boundaries and spatial and time scales

6. **Adequate information** upon which to base the dialogue, and strong, accepted science

7. **Accept local knowledge**, including validated anecdotal knowledge, not just science

8. **Workable solutions** expressed clearly and succinctly

They were nothing more than people by themselves… But all together, they had become the heart and muscles and mind of something perilous and new, something strange and growing and great. Together, all together, they were instruments of change.

Keri Hulme
The Bone People
This website is about the ICM Motueka Programme. Its purpose is to provide information resources relevant to project participants and to the stakeholders of the Motueka River catchment. The site is a collaborative venture between a number of organisations. Please read about our site.

The Motueka River catchment is a Global HELP Catchment.

**Our Site**
General information about the site, the ICM Motueka project, and its purpose - includes site map.

**Our Catchment**
Overview of the Motueka River catchment - includes virtual field trips.

**Our Science**
Outlines the research being conducted in the catchment.

<table>
<thead>
<tr>
<th>Science Quick Links</th>
</tr>
</thead>
</table>

Site kindly hosted by Landcare Research

**Hot Topics**
Current events and notable happenings from the Programme Leader.

**Project Staff Room**
(Available only for programme participants).

**Library of Resources**
Includes reports, fact sheets, images, maps, and other resources.

<table>
<thead>
<tr>
<th>Library Quick Links</th>
</tr>
</thead>
</table>

**Announcements**

- **10/12/02** Recent conference abstracts added
- **10/12/02** HELP conference in Kalmar Sweden 2002
- **06/11/02** 2002-03 overview & progress

To receive email notice of events and research findings please join our ICM Motueka discussion group