Cultural River Health

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Cultural River Health

How can we reconcile Māori and Pākeha values for improved water quality?
A Māori world view

• A natural order to the universe, overarching principle of balance
• Whakapapa (central thread)
• (W)Holistic – Inter-relationship of all living things to each other (interconnection between all parts)
• Kete o te wānanga – The three baskets of knowledge by Tāne (kete aronui, kete tuauri, kete tuatea)
• Tikanga (custom, protocols, values)
• Mātauranga Māori, Māori values, Māori issues
• Traditional concepts and values integral (e.g., whakapapa, mauri, taonga tuku iho, kaitiakitanga, whānaungatanga, manaakitanga, rangatiratanga, mana whenua, mana moana, wairua, tapu, etc.)
• Maori wellbeing linked to the health of the environment
Cultural monitoring in Motueka (2005 – 2010)

Cultural monitoring/reporting can:
• Provide an indigenous knowledge/perspective on the environment;
• Articulate cultural values & aspirations;
• Identify trends/change from a Maori perspective;
• Be collated/aggregated to report on the iwi/hapū state of the environment (from a cultural perspective);
• Help contribute to responsibilities under kaitiakitanga, whakapapa, tino rangatiratanga, etc;
• Give responsibilities and importance of tangata whenua engaged in Resource Management (RMA 1991);
• Build iwi /hapū/whānau capacity in RM;
• Feed into other SOE reporting (i.e. local, regional, national)
In future environmental monitoring programmes could be classed into three main types that are complementary:

<table>
<thead>
<tr>
<th>Māori knowledge based</th>
<th>Community – scientific based</th>
<th>Scientific based</th>
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</thead>
<tbody>
<tr>
<td><strong>Māori indicators –</strong></td>
<td><strong>Community based indicators –</strong></td>
<td><strong>Scientific indicators –</strong></td>
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<td>In depth Māori understanding and knowledge of particular environments. Understanding of Māori values, goals, and aspirations required. Examples:</td>
<td>requiring low levels of technical input and skill but scientifically robust and part-value based. Cost effective, relatively simple and short duration. Examples:</td>
<td>requiring higher levels of technical input and skill, robust sampling strategies, analysis and interpretation. May be time consuming. Examples:</td>
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<td>- Taonga lists; - Key sensitive taonga indicators; - Te Mauri; - Knowledge on uses and preparation of taonga; - Land-uses, point discharges, modification, impacting on cultural values and uses.</td>
<td>- Hydrology; - Soils/Nutrients; - Intactness of wetland; - Connectivity/Buffering or Fragmentation; - Introduced plants; - Animal damage; - Modifications to catchment hyrdrology; - Water quality within catchment; - Other landuse threats; - Key undesirable species; - % catchment in introduced vegetation; - Animal access.</td>
<td>- Chemistry, water quality, nutrients; - Hydrology; - Water table modeling; - Botanical mapping, classification of plants; - pH; - Bacterial counts; - Giardia; - Cryptosporidium; - GIS applications; - Satellite imagery; - Studies of fish, macro-invertebrates, macrophytes.</td>
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Location: Motueka catchment across to Nelson
Cultural River Health

• Provides a Māori perspective of rivers/streams – Māori aspirations and goals
• Use of mātauranga Māori (knowledge) and Māori values (relationship or connection to place)
• Identifies issues and change from Māori viewpoint
• Links Māori wellbeing and river/stream health
• Use of indicators and assessment
• Reporting
• Planning and policy
• Actions (e.g., restoration projects, mahinga kai, capacity building, GIS)
Cultural indicator assessment
Motueka and Riwaka catchments
Ngā Atua domains framework

Ranginui
The sky father, immeasurable universe

Tawhirimatea Atua of the wind & air

Tumatauenga Atua of war & tangata (people)

Nga Atua Kaitiaki
The spiritual guardians

Haumietiketike Atua of wild foods including fern roots

Rongomatane Atua of peace & cultivated foods

Tane Mahuta Atua of ngahere (forests) & nga manu (birds)

Tangaroa Atua of nga moana (seas), awa (rivers) & roto (lakes)

Papatuanuku
Earth mother, planet earth

Figure 1: Atua (departmental gods) domain framework Source: Tiakina te Taiao, Dean Walker.
Methods

• Training, field assessment (geo coordinates, place), reporting, and GIS entry and analyses;
• Assessment forms (iwi indicators), score sheets—ratings.
• Inventory: Site status, mahinga kai, total CHI score, Score 1-5: 1 – poor; 5 – excellent
Indicators (examples)

**Tangaroa**
- Water Clarity
- Water Flow
- Water Quality
- Shape and form of river, riverbank condition, sediment
- Insects
- Fish

**Tāne Mahuta**
- Riparian vegetation
- Catchment vegetation
- Bird life (species)
- Ngahere/Taonga
- Pests

**Haumie tiketike**
- Mahinga kai
- Rongoa

**Tūmatauenga**
- Human activity, Use of river
- Access
- Cultural sites

**Tāwhirimātea**
- Smell
- Weather

**Ora**
- Feeling, taste, wellbeing
Links between science and cultural indicators
Cultural Stream Health Measure

**E. coli (cfu/100 mL)**

- $r = 0.519$
- $p = 0.058$

**% Native Vegetation**

- $r = 0.846$
- $p = 0.0001$

**SQMCI**

- $r = 0.526$
- $p = 0.053$

**Clarity (m)**

- $r = 0.519$
- $p = 0.058$

**E. coli (cfu/100 mL)**

- $r = -0.48$
- $p = 0.13$
Results

• Links between science and cultural indicators;
• Some good correlations, some poor;
• Strong correlation between cultural health and increasing % of catchment area natural/indigenous cover;
• Science /cultural monitoring together gives a rich, full picture of river health (and the environment)
• Cultural indicators impose stricter environmental standards
• We can use complementary monitoring and reporting