



## INNOVATIVE LEARNING TOOLKIT

### **PROJECT TITLE: Community monitoring**

#### **Tags; environmental monitoring, schools, environmental footprinting**

The conventional approach to environmental monitoring and measurement involves scientists and experts designing the measurement frameworks and conducting all of the actual research and measurement. There are a number of case studies and examples that turn this notion on its head, and involve the community directly in designing and carrying out the measurements.

This is beneficial in terms of improving relationships and understanding between the scientific community and the wider community.

### **EXAMPLES AND CASE STUDIES**

#### Project Twin Streams

Community groups work in collaboration with [WaiCare](#), to help local schools (among other groups) to monitor streams. The most common tests performed include measuring temperature, turbidity, pH, phosphate, nitrate, dissolved oxygen and macroinvertebrates.

The process of learning how to conduct valid scientific measurements, how to plan and design the study, how to record the results as well as the actual measuring processes gives students fantastic opportunities to think creatively, and use their imagination to come up with solutions to ecological problems.

The results give highly valuable and accurate data that wouldn't ordinarily exist, plus increased community knowledge and capability - and its lots of fun for the participants!

### **OTHER REGIONAL, NATIONAL AND INTERNATIONAL EXAMPLES**

One NZ example that involves the community in directly measuring environmental outcomes and indicators is [Te Rangatahi o te Whenua Trust](#). The programme involves the rangatahi/youth directly in measuring environmental outcomes and indicators such as kaimoana surveys, species assessments and observations. The rangatahi designed and implemented the survey processes and documented the results with assistance from marine scientists.

Other examples along similar lines, that involve the community directly in undertaking environmental measures, include [Friends of the Whau](#), the [Kaipatiki Project](#) and the [Lincoln Envirotown Trust](#).



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Ngai Tahu's [State of the Takiwa](#) project is an example of iwi monitoring environmental health, using a centralised database that is accessible for iwi members to add descriptions, photos, and qualitative and quantitative assessments to.

Approaches such as these could be integrated into other inquiry based methods to create a dynamic programme within schools. For example, [Future Problem Solving](#) is a year-long programme where students, working in teams, learn and apply a six-step problem solving process which provides them with the tools to tackle problems which they will meet throughout their life. Throughout the year, students apply the process to consider the challenges and issues contained within complex social and scientific problems to be faced in the future or tackle existing problems in their own communities. The programme encourages students to carry out in-depth research, to think creatively and critically, to apply ethical thinking skills and to work as part of a team.

The [EcoTeam Programme](#) is another longer-term initiative that involves participants setting goals, in terms of energy consumption and waste reduction, and then measuring their progress against these goals. They then submit their data to a central database allowing for personalised feedback and demonstrating improvements over time.

### Tools for Footprinting

There are also opportunities to create community footprinting tools that allow people to measure their own impact on environment, and specifically water.

For example, the [Water Footprint Network](#) is an organisation dedicated to raising awareness around water usage by facilitating resources for individuals and communities to use to measure and understand their impact on water. They have a [water footprint calculator](#) that people and businesses can use. They also have a number of calculations on national water usage and footprints - NZ will be included at the end of 2009.

EPA Victoria's multimedia [ecological footprint calculators](#) include measurement tools for individuals, households, organisations, schools etc.

### IDEA INCUBATOR

one of the contributors suggested training community groups on how to use small electrode devices or Thermistors that can be dangled into a creek to measure oxygen levels, salinity, nitrates and/or temperature. These can record and report data real time. The participants can design where and when the measurements occur (eg in the stream outside their house or down the road) and how they structure and report the data, and it can be very interactive. This could be used to monitor water temperature and compare to the temperature eels or invertebrates need to survive, for example

we could encourage community groups / school children to measure the amount of water they consume each day from all of their activities including showers, drinking, washing, brushing teeth etc. This would be a great mechanism to raise awareness around water use



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among participants and their families, and it would produce useful data for the council. The key is to do this in a way that is fun, and uses technologies and media that they use in their leisure activities.

students could also create colour-coded catchment management and water quality maps based on the data - this could be web based, and potentially linked to a range of other worldwide sites (see below)

they could create GIS maps and layers, by entering data, images and GIS codes into a specific website (the website would probably need to be built by Council). The students could decide what information was relevant, but this could include photo images, pollutant levels, climatic data, river flow, etc. The students could also control the content/data and could track environmental changes over time. They could potentially create a catchment CD rom with interactive maps like GIS, or publish their results more formally this data could be used to identify and mark pollution sources, rubbish, weeds, native plants, etc using GPS locative technology, then plotted using Google Earth or other [digital mapping](#) tools, or even converted into mobile [geo-caching games](#) and [walkumentaries](#). online community footprinting tools developed specifically for an Auckland (or NZ) audience would be a wonderful way of empowering people to understand, and make choices about their actions, and assist them in systemic thinking. Particularly if it was combined with a digital mapping programme that helped them make links between the sources of their household energy, and impacts of their waste and transport on the local environment. ie where things come and go in relation to their household. See the [appalachian mountain top removal](#), and [NAILS](#) case studies for inspiration here.

### FURTHER INSPIRATION AND DISCOVERIES

There are some general assessment and sustainability available:

The Ministry for the Environment's (MfE) [Cultural Health Index](#) incorporates visual assessments of the biological and cultural health of rivers and streams, which are then represented in quantitative scores that can be incorporated into local government management of waterways. The framework uses traditional iwi and hapu assessment methods, and correlates to scientific assessments such as the MCI Index. As well as the user guide, a series of workshops were held nationally to train people in how to teach others to use the Cultural Health Index. See also: <http://www.mfe.govt.nz/publications/water/cultural-health-index-for-streams-and-waterways-tech-report-apr06/cultural-health-index-for-streams-and-waterways-tech-report-apr06.pdf>

The Waikato Indicators for Community Health are one of the more comprehensive set of indicators developed at a regional level in New Zealand. [http://www.choosingfutures.co.nz/files/Core\\_Set\\_Of\\_Indicators\\_For\\_Community\\_Outcomes.pdf](http://www.choosingfutures.co.nz/files/Core_Set_Of_Indicators_For_Community_Outcomes.pdf)



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MfE is also developing national environmental indicators <http://www.mfe.govt.nz/publications/ser/environmental-indicators/index.html>