TRaCK
Tropical Rivers and Coastal Knowledge

Water Quality Monitoring

A water quality monitoring framework for the Katherine and Daly river catchment

Water quality needs to be managed to ensure good river health. To make water quality monitoring and its management more comprehensive and collaborative, a Water Quality Monitoring Framework for the Katherine and Daly catchment has been developed. The Framework is the first step needed to improve the water quality monitoring of both surface water (the water in streams, rivers and billabongs) and groundwater (water within aquifers underground accessed via bores and springs). It is called a Framework because it sets out what needs to be considered when a water quality plan is developed.

Simon Townsend monitoring water quality at Green Ant Creek. Photo: Ian Dixon

What is water quality monitoring?

Water quality monitoring involves the measuring and checking of the physical (e.g. temperature, turbidity – the cloudiness of the water) and chemical (e.g. dissolved oxygen, nitrogen and phosphorus) characteristics of water. Measurements are made in the field or water samples are collected and analysed in a laboratory. The results can then be used to manage water effectively.

Why does water quality monitoring matter?

Changes in land use and increasing uses of our water resources can cause water quality to deteriorate. Poor water quality can directly affect our own lives. For example, water pollution can limit the use of water for swimming, irrigating crops, and supporting plants and animals. Such uses of water – for the environment, swimming, drinking and agriculture – are known as 'beneficial uses'.

Water quality monitoring can show us:

- If surface water and groundwater are polluted
- Along with other river monitoring, how healthy our rivers are
- Whether land and water uses affect water quality
- If our management policies and actions are working to manage water quality.

What does the Framework tell us?

1. Link cause and effect

To do worthwhile monitoring you need to understand how threats associated with land and water use are linked to impacts. That is, what are the causes of poor water quality and what are their associated effects? The Framework makes these links, using flow charts, for: land clearing; fire; extracting water; pesticides; high-nutrient materials; mining and wet season runoff / floods (see Figure 1).

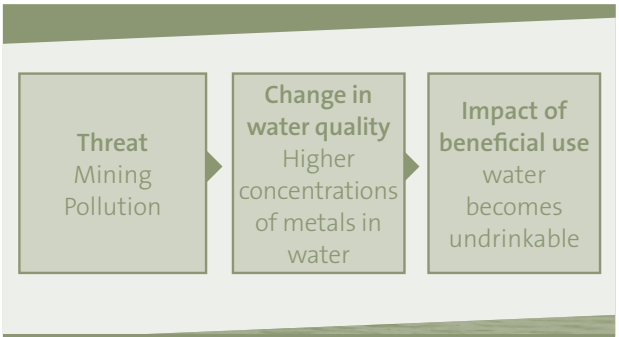

Figure 1: An example of how a threat and beneficial use are linked by water quality.

2. Collaborative effort and a central database

Monitoring needs to be collaborative and coordinated. There are many organisations currently monitoring water quality, each with their own goals and actions. Combined monitoring programs would contribute to a catchment-wide assessment of water quality. To achieve this, a central and accessible database would be required.

3. Manage the many beneficial uses of water

Feedback from the community showed that water quality must be managed for its many beneficial uses. In the NT, the beneficial uses of water are defined as environment, agriculture, aquaculture, culture, public water supply, rural stock and domestic, and industry. Beneficial water use for the environment should be closest to a natural, unpolluted state.

4. Be adaptable

The purpose of monitoring is to effectively manage water resources. Water quality monitoring must be part of an adaptive management cycle (see Figure 2) so the work is continually reviewed and improved on.

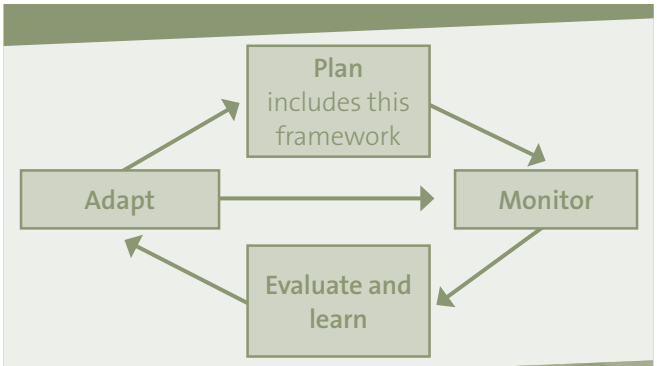

Figure 2: Steps in an adaptive management cycle for water quality monitoring.

5. Talk about it

Water quality monitoring results need to be accessible and communicated on a regular basis.

6. Whole-of-catchment assessment

Monitoring should not be done in isolation, it should consider catchment-wide pressures rather than just specific sites. Catchment-wide assessment will provide information about whether there are links between changes in water quality and catchment activities.

7. Water quality monitoring is part of river health monitoring

Water quality monitoring does not give the full picture of river health. Other indicators of river health include the fish, bugs and plants in the river. Monitoring river bank erosion and the vegetation along the river banks also tells us about the health of a river.

Lyz Risby asking the community about which water uses should be managed. Photo: Simon Townsend

The next step

Establish a 'River-health technical advisory committee', which reports to the Daly River Management Advisory Committee (DRMAC). The Committee would provide technical advice on river health and associated issues and would assist in collaborative monitoring.

Who did this project?

This project was lead by TRaCK researchers Lyz Risby and Simon Townsend. It was a partnership between Charles Darwin University, the Department of Natural Resources, Environment, the Arts and Sport, the DRMAC and the community.

The project was initiated and funded by the Northern Territory Natural Resources Management Board.

Natural Resource Management Board (NT)

Where to go for further information

Visit the TRaCK website:
http://www.track.gov.au/research-projects/405

Download the full report here:
http://www.track.gov.au/publications/registry/765

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Australian Government
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Material Budgets