

Monitoring water quality and quantity

IN THE NORTHERN AND YORKE NRM REGIONS



Why monitor?

Water is a critical natural resource for people and biodiversity. In the N&Y region, availability of good quality water is highly variable with quality and quantity being closely linked. By monitoring both the quality and quantity of water, it is possible to get feedback on the effectiveness of water management initiatives in the region. The Environmental Protection Agency (EPA) and Department of Water Land and Biodiversity Conservation (DWLBC) work with the N&Y NRM Board to monitor the region's water resources including the creeks, streams, rivers, coastal waters, groundwater and aquifers.

Water quality – what can be monitored?

Water quality describes the condition of the water resource and its suitability for different purposes. A healthy water resource can support a rich and varied community of organisms and sustain public health and agricultural use.

The 'health' of the region's water courses (rivers, creeks and streams) has been monitored by the EPA using aquatic macro-invertebrates as a biological indicator. Macro-invertebrates are aquatic animals without backbones and are large enough to be seen with the naked eye. They provide a relatively simple way to assess the health of the aquatic ecosystem. They include insects, crustaceans, snails, worms, mites and sponges. Among the insects used are midges, two-winged flies, dragon flies, mayflies, water bugs, beetles and spring tails. Crustaceans that are used include yabbies, freshwater shrimps, and prawns.

Chemical indicators are also used by the EPA to determine the condition of the region's water resources. These include the level of nutrients such as nitrogen and phosphorus, turbidity and salinity. When these chemicals reach a certain level they can cause stress and poison plants and animals. The levels of these chemicals also indicate whether the water is suitable for human consumption and for recreational activities such as swimming.

River flows in the 4 main catchments in the region; the Light, Broughton, Wakefield and Willochra, are infrequent so few samples have been collected by the EPA. The most recent data is for 2007, which indicated the following:

- **Light** – rated in good condition as nutrient and turbidity levels are low.
- **Broughton** – rated in good condition indicating that water quality was not being unduly affected by surrounding land uses
- **Wakefield** – ecological health had changed from good condition in 2003 to impacted in 2004 and 2007 possibly due to a rise in salinity
- **Willochra** – only moderately healthy due to high salinity and high nutrient concentrations, although this catchment is naturally saline.

Groundwater and the aquifer systems are monitored by selecting an even spread of wells that extends across the aquifer and regularly measuring the quality of the water from those wells. The EPA does not currently monitor any wells for groundwater pollution and salinity in the N&Y NRM region.



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The OBSWELL facility, managed by DWLBC, provides access to SA observation bores that have been established to monitor trends in water levels and salinity levels. There are a range of observation wells across the N&Y NRM region. Water level and salinity monitoring data is available for users to view and download free of charge at www.obswell.pir.sa.gov.au

Quantity – What can be monitored?

Stream flow is measured at a number of gauging stations set up within the N&Y NRM region.

These in stream structures are designed to channel stream flow in a manner that produces a relationship between water level and discharge. Recording water level electronically at these structures enables discharge to be measured continuously. It is important to measure as wide a range of flows as possible, particularly the less common high flow events so a complete water level - discharge relationship can be derived.

Most of the more recent stream gauging stations, including those in the N&Y NRM region, use flat-vee weirs. Unlike more conventional V-notch weirs or reservoir spillways, flat-vee weirs do not create abrupt changes in water level which can impede the normal migratory habits of some aquatic fauna. They also have less impact on stream flow compared to many natural features, such as debris, rocky outcrops and waterfalls. Additional gauging stations may be established to fill in current gaps in information about water flow in the region.

A system of monitoring water levels at representative permanent pools may also be implemented by the N&Y NRM Board. This requires a larger number of sites to be monitored than for the measurement of river flows. The main interest is the depth of water and not flow, so expensive weirs are not required. However, it does require an innovative approach to develop a cost effective and reliable means of measuring water levels.

Further information

River Management Plans for Light, Wakefield and Broughton Rivers. www.obswell.pir.sa.gov.au



For more information

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