

Volunteers monitoring in South Australia's arid regions can significantly add to the existing scientific knowledge of these areas. In many cases little or no other data exists for aquatic ecosystems, therefore community-collected data can be extremely useful in terms of natural resource management for these remote regions. Through Waterwatch, local stakeholders in the Broughton and Wakefield catchments in the mid-north of South Australia are encouraged to participate in regular Waterwatch monitoring and other events such as Saltwatch, Frog Census and Aquatic Snapshots.

Saltwatch is an environmental monitoring program that helps Waterwatch groups learn about the effects of salinity on water quality in their catchment. South Australia first participated in the National Saltwatch Snapshot in 2001 and 30 groups from the Broughton Wakefield Waterwatch program participated. All of the salinity data collected in the Broughton and Wakefield catchments was accepted as part of the Saltwatch quality control program, indicating that the community collected data was of a very high standard and representative of catchment health. For 2002, 52 groups from this region will be participating in Saltwatch.

The level of participation in volunteer monitoring from this semi-arid region highlights the community's interest in and commitment to being involved in water quality issues relating to their catchment.

Lake Tuggeranong (ACT)

The Tuggeranong catchment revolves around an artificial lake of 70 hectares in a relatively new suburb development area in the ACT. Established in 1987, the lake was constructed primarily as a sediment trap to collect the anticipated runoff of silt and debris from a major suburb development.

A Waterwatch Centre has been established at the Lake Tuggeranong College and regular water monitoring activities have been carried out by students and members of the community for about 10 years. The overall 'health of the lake' is regarded as 'good-excellent' based on the chemical and physical measurements and biological diversity.

A major secondary purpose of the lake is recreation, including fishing, sailing



and swimming. Considerable community concern has evolved over the past few years about inappropriate developments around the lake. As a community watchdog the Waterwatch network has been influential in alerting the relevant authorities to Lake Tuggeranong's water quality issues. Waterwatch groups have reported on the presence of toxic blue-green algae, which has been observed and reported by Waterwatchers since 1992. Authorities have closed the lake for recreation purposes several times in response to these observations.

Waterwatchers have also been helping to raise awareness about fish in Lake Tuggeranong. Since 1990 25,000 Murray Cod and 61,000 Golden Perch have been introduced into the lake. These fish appear to be well established and angler catches have been documented. Recently a dozen 4 kg Murray Cod and a similar number of good sized Golden Perch were transferred back into the lake by Environment ACT officers and Waterwatch helps from the stilling basin downstream of the dam wall.

Local Waterwatchers will continue to monitor the water quality of Lake Tuggeranong to ensure that recreation activities can continue safely for all users.

The invisible flow of the Boyne River (QLD)

The Dulong State School Waterwatch group began monitoring the Boyne River in South Burnett, SE Queensland in August 2001. When the Dulong Waterwatch group started their monitoring activities the Boyne River was considered to be 'dry', as it only appeared to flow for a short period after good rains.

Waterwatch

The group selected a reliable 'pool' of water on which to focus their water monitoring activities which included measuring temperature, pH, turbidity, electrical conductivity, dissolved oxygen and biodiversity.

The Dulong Waterwatch group were intrigued when the results of their measurements did not fit the conditions expected from a 'pool' of water. Under the guidance of the South Burnett Waterwatch Office, Dulong State School's Waterwatch group decided to investigate the unusual Boyne River further.

The group dug two spaced holes into the sandy/gravelly bed of the river until the watertable was at the surface. They then placed an ink tracer dye into the water of the upstream hole and found that the water was flowing within the sand bed instead of being still as originally thought. Thus the 'pools' of water are the visible parts of the flowing river where the layer of sand is not thick enough to cover the water. This finding explained all of the water quality data collected during their water monitoring activities and solved the mystery of the invisible flow of the Boyne River.

The Australian Waterwatch Network

More information is available from the Waterwatch Australia website: www.waterwatch.org.au or please phone the Waterwatch contacts listed below.

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Photo 1—Yea River Waterwatch Group, VIC. *Photo courtesy of the Yea River Waterwatch Group.*

Photo 2—King Island Waterwatch volunteer recording groundwater and salinity levels from a piezometer. *Photo courtesy of the King Island Waterwatch Group, TAS.*

Photo 3—Students from schools in the North Parramatta region taking part in a catchment crawl and testing the water quality in Lake Parramatta. *Photo courtesy of Waterwatch NSW.*

Photo 4—Photo of Talbot Brook in the Avon River Basin, WA. *Photo courtesy of the Talbot Brook Land Management Association.*

Photo 5—Water Monitoring at Lake Tuggeranong, ACT. *Photo copyright Waterwatch Australia, photographer Sandy Spiers Photography.*



Waterwatch

Community Water Quality Data



Waterwatch is a national community water monitoring network that encourages all Australians to become involved and be active in the protection and management of their waterways and catchments. Waterwatch is supported by the Commonwealth Government's Natural Heritage Trust in partnership with all levels of government, industry and the community.

The Waterwatch network is made up of individuals, community groups and school groups who undertake a variety of biological and habitat assessments as well as physical and chemical tests to build up a picture of the health of their waterways.

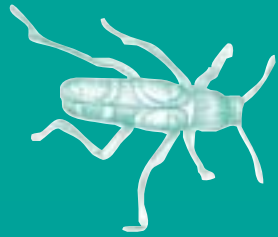
The following stories highlight the types of water quality data which the Waterwatch network collates through water monitoring and how this data is used to assist the community, government and industry in natural resource management.



Natural Heritage Trust

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Waterwatch is an important element in the conservation of waterways. Our water systems are threatened by unsustainable levels of water extraction, the destruction of aquatic and riverbank habitat, weed growth, algal blooms and rising levels of salinity, silt and pollutants.

Across Australia data is collected by monitoring groups using nationally adopted protocols for nine parameters which include macroinvertebrates (water bugs), dissolved oxygen, temperature, pH, conductivity, turbidity, reactive phosphorus, nitrogen and riparian habitat assessment. The data is recorded using nationally agreed units and national site code systems.

Once collected the data is entered into a standard national Waterwatch database. The data can then be pooled, analysed and interpreted for specific catchments or larger regions. This system enables reports to be produced for water management authorities to assist in natural resource management.



King Island's saline groundwater monitoring program (TAS)

King Island is the second largest of the Tasmanian Bass Strait Islands, lying at the western end of Bass Strait. In 1999 a Department of Primary Industry, Water and Environment (DPIWE) snapshot survey identified the need for on-going collection of water quality data, and through the King Island Natural Resource Management Group, the local Waterwatch program was born.



One of the most important roles for Waterwatch Groups on King Island is to support the on-going saline groundwater monitoring program. The program is part of the DPIWE's Salinity Community Partnerships Program, and involves landholders monitoring the groundwater and salinity levels in specially designed bores called piezometers.

The piezometers have been installed on private properties in salinity hotspots and each month the land managers are provided with a data sheet where they can fill in their observations for each piezometer. The completed data sheet is then faxed back to the Waterwatch Coordinator who records and analyses the data before forwarding it onto the DPIWE Salinity Officers.

The key to the great success of this program has been the commitment of the participating landholders who monitor the eight piezometers across each of their properties every month. These individuals know all too well the impact dryland salinity can have on their properties and production, and are keen to assist in collecting sound, quality data to help fully understand the cause, status and scope of the problem on King Island.

The King Island Salinity Community Partnerships Program is taking a catchment wide, strategic approach to understanding the problem. From the on-going water data these community members collect and the soils data collected when the piezometers were installed, DPIWE & King Island Waterwatch are now able to start identifying innovative, catchment specific management approaches for the thousands of hectares affected by dryland salinity on King Island.

Lake Parramatta—Swim Towards 2005 (NSW)

Most people visiting the bustling commercial centre of Parramatta in Sydney's West would not realise that only two kilometres from the Central Business District lies historic Lake Parramatta. Built in 1856, the arched sandstone dam forms a 10 hectare lake that provided freshwater for the Parramatta District until the early 1900s. The beautiful bushland setting of the lake made it a popular local recreation area, and from the early 1920s, the lake was a popular local swimming hole.

After a housing boom in the upper catchment in the late 1970s, the health of the lake started to suffer. In the late 1980s the Parramatta City Council prohibited swimming in the lake due to concerns about pollution and risks to community health.

From 1998, with the assistance of grant funding from the Commonwealth Government's Natural Heritage Trust, the Upper Parramatta River Catchment Trust co-ordinated local Waterwatch Schools to collect water quality data on the lake. Students from Cumberland High School, James Ruse Agricultural High School, The Kings School, Muirfield High School, Tara School for Girls, and more recently Burnside Primary School, took part in testing programs to establish the health of the lake.

The main problems identified by the students and outlined in the Lake Parramatta Water Quality Management Plan included nutrient rich runoff from surrounding residential areas, sewage pollution following heavy rain, the large number of dumped domestic ducks at the lake, and a lack of awareness about the impacts of local residents on the lake.

Parramatta City Council and the Upper Parramatta River Catchment Trust have adopted a program of activities to address these problems and achieve swimmable water quality in Lake Parramatta by the year 2005.



The River People (VIC)

The Goulburn Broken Catchment Management Authority recognised the need for high rainfall event monitoring along the Yea River. It had regular monthly monitoring results to provide some information, but they were most interested in data collected after rainfall. Rain increases turbidity by washing soils, nutrients and litter into a waterway. Finding out where exactly these sediment loads come from was seen as essential in order to implement best practice management in the catchment.

Realising that the human resources required to undertake water monitoring activities across the catchment was considerable, the regional Catchment Management Authority turned to Waterwatch for assistance. The Yea River Community Monitoring Group was formed in response to media articles asking for volunteer monitors. Comprising 14 locally based volunteers, the group now monitors at 20 sites.

Initially members of the group were issued with data sheets and testing equipment. Together they devised a monitoring plan taking into account individual concerns such as turbidity sources, litter dumping and stormwater drains. Group coordinator Glenda Woods regularly visits all of the sites to take photos, complete water tests and to ensure equipment is being used correctly to collect accurate data. As Glenda says, "Who better to monitor the river than the people who live along it?"

Mhulunbuy Primary School Waterwatch Group (NT)

The Mhulunbuy Primary School Waterwatch group from Northeast Arnhemland in the Northern Territory had been monitoring the water quality of the Beagle Circuit Creek for a year when they discovered increasingly high nitrate and phosphate levels.

After continuing to monitor the site for a couple of weeks and with the results remaining the same they notified the local council. The students, with the local health inspector, tracked up the creek to see if they could find the source of the pollutants. It eventuated that the evaporative ponds were not working properly and the sewerage pond outlet was emptying into the creek.

At a later stage the students noticed a blue green swirl starting to form on the water which they subsequently sampled and sent to the Water Resource laboratories in Darwin for analysis. The analysis confirmed that the students had found a thick infestation of blue-green algae.

The local council in consultation with the Waterwatch Coordinator and Water Resources undertook further monitoring to confirm the group's results. As a result, a large capital works program was devised to drain the ineffective pond completely and re-route the water to alternative town ponds. Waterwatch data in this instance was directly related to major environmental change in the community.

Talbot Brook Land Management Association (Inc)—(WA)

The Talbot Brook Land Management Association has been actively involved in collecting water quality data since its inception in 1994. Located between York and Beverley, the catchment lies within the wheatbelt region of Western Australia, and like many other areas suffers from rising groundwater and salinity.

The group has a good collection of base line data and in 1995/96 they were awarded a National Landcare Program grant to look at catchment planning and water table monitoring. The group have been monitoring surface and groundwater quality



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since 1997 as part of the Water and Rivers Commission's Avon Community Water Quality Monitoring Program (ACWQMP) funded through the Natural Heritage Trust.

Funding has been used to set up regular monitoring programs to look at nutrients, sediment and salinity levels of the Talbot Brook throughout the year. Water quality information collected to date has provided an excellent set of baseline data in which future changes to the water quality of Talbot Brook, its many tributaries and the surrounding catchment can be monitored.

A foreshore and channel assessment of the Talbot Brook was completed in 2001 as part of a Natural Heritage Trust project supported by the Water and Rivers Commission: Management surveys of major Avon tributaries. This data will be combined with water quality monitoring data to provide a greater knowledge and understanding of catchment health and help to prioritise areas for future management.

Communities monitor waterways in South Australia's arid regions (SA)

In 2002, the 'Year of the Outback', it is timely to acknowledge the contribution of volunteers to monitoring in South Australia's arid and semi-arid areas. Arid areas have attracted considerable scientific interest for their outstanding natural values. However, monitoring of their aquatic ecosystems has been limited due to the variability of rainfall, unpredictable presence of water and increasing travel time and costs due to their limited access, especially during flood events.