

Water Quality Issues



Inland waters include creeks, rivers, wetlands, lakes and groundwater systems. South Australia's surface waters (rivers and streams) support important aquatic ecosystems that are important for a diverse range of plants and animals. They are also important for many of the state's industries, including irrigated agriculture, manufacturing, food processing and wine making. Our rivers and streams provide a focus for water-based recreational activities and ecotourism. The River Murray and

the rivers and streams in the Mount Lofty Ranges supply drinking water for most of the state's population and these are under stress from major pollution. For information on the River Murray, see the River Murray fact sheet.

South Australia's groundwater is also very important to the state for providing social, economic and environmental benefits. Groundwater provides much of the state's irrigation water for horticulture, agriculture and viticulture, and is a very important drinking water supply for regions where there is little surface water run-off and effective storage sites are not available. Polluted groundwater may reduce biodiversity and reduce agricultural and horticultural productivity. Human health may also be at risk.

Wetlands are among the most biologically productive and diverse habitats on the planet and perform many important functions such as the biochemical transformation and storage of water; production of living plants and animals; and decomposition of organic matter. Wetlands can have significant recreational and tourism values as well as spiritual and cultural significance for indigenous Australians. Many wetlands have been lost since European settlement.

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Trends



Rivers and creeks: **stable**. Rivers and creeks are generally in a moderate to poor condition with respect to their nutrient and turbidity levels:



River health: **declining**. The change in river health as indicated by macro-invertebrates (with the exception of the River Murray) appears to be deteriorating due to the effects of the prolonged drought in 2005/06.



Groundwater quality: **stable** throughout most of the State although nutrients are still poor in many regions and salinity is increasing in some regions.

Water Quality

What is the Current Water Quality Situation?

Condition indicators

Exceedences of water quality guidelines for creeks, rivers and groundwater

If a water quality guideline is exceeded it means that the measure of water quality has gone above acceptable levels. The Environmental Protection Agency (EPA) has been monitoring 52 inland sites to investigate the water quality of creeks, rivers and lakes (not including the River Murray or lower lakes). The most important water quality indicators for these waters are nutrient levels and turbidity as these are the best indicators of pressures from land use.

Turbidity refers to how clear the water is – water with high turbidity has lots of suspended particles in it and is very cloudy. The majority of the sites tested were in moderate or poor condition when nutrient and turbidity levels were compared with the National Water Quality Guidelines for the protection of freshwater ecosystems.

The EPA also monitors groundwater in key areas where groundwater resources are known to be under stress such as the South East, Northern Adelaide Plains, Barossa Valley, Adelaide Plains, Willunga Basin and the Eyre Peninsula. Groundwater in these areas varies considerably but the majority are rated as poor for nutrients and salinity.

River health assessed according to the Australian River Assessment System

The Australia River Assessment System (AUSRIVAS) is a national approach for assessing river and creek health. Inland freshwater riverine ecosystem health, as assessed by AUSRIVAS, has generally declined throughout South Australia as a result of the drought. This was particularly evident by the loss of flowing water habitats from most creeks starting in spring 2005 in some parts of the state, and the loss of flow becoming more widespread by spring 2006 and 2007.

If the current drought continues, and rainfall patterns remain well below the annual average, then major long term changes to aquatic ecosystems throughout the state can be expected.



Areas of concern

Reduced water-flows because of unsustainable water extractions –

reducing creek-flows has decreased the diversity and abundance of the plants and animals that would normally flourish under flowing conditions.

Clearance of natural vegetation in catchments –

loss of natural vegetation has increased soil erosion, which can also carry significant nutrient loads from affected catchments.

High rates of nutrient and sediment export from some land uses –

increased nutrient and sediment levels can drive more frequent algal blooms.

Introduction of exotic plant and animals –

introduced fish, macro-invertebrates and snails have affected the ecological community structure within many creeks causing adverse effects on native fish and frogs. This issue is common throughout South Australia.

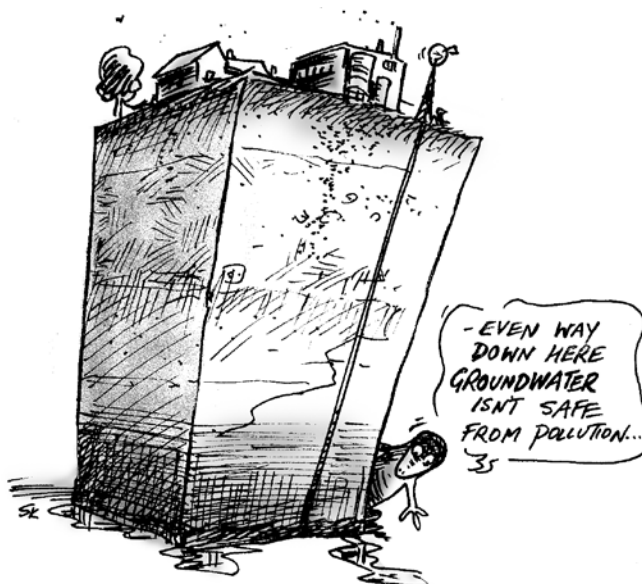
Water Quality



Responding to Water Quality issues

The government has developed a variety of programs around the state to help improve water quality. **The National Water Quality Management Strategy (NWQMS)** provides a basis for the sustainable management of water resources in South Australia. Establishing environmental values for surface waters and groundwater is the first and most important part of this process.

Setting specific environmental values requires the community as a whole to decide how important our water environments are and what they should be used for.



Rivers, Streams and Wetlands

Condition of wetlands

There are no agreed methods to assess wetland condition in South Australia, despite the important roles of wetlands and the threats to their existence. Wetland condition is not well documented for most wetlands. Some wetlands have been well researched and studied including Lake Bonney and Lake George in the South East. The National Wetlands and Waterbirds Taskforce has been working on a national protocol for assessing wetland condition and more work is needed to apply this, and develop a South Australian condition assessment for wetlands.

"Water catchments in the Mount Lofty Ranges and the River Murray Basin are significant sources of drinking water for Adelaide."

Water Quality in the rivers and streams of the Mount Lofty Ranges

Water catchments in the Mount Lofty Ranges and the River Murray Basin are significant sources of drinking water for Adelaide, and support a number of important aquatic environments. Water quality in the region is reduced by poorly maintained septic tank systems; livestock grazing along watercourses; excessive applications of fertiliser; vegetation clearance; major water supply reservoirs; and farm dams.

Maintaining good water quality in this environmentally sensitive region is of great importance. Nutrients from urban and rural areas can run-off into rivers and streams, and enter water supply reservoirs where they can cause algal blooms. Faecal contamination from animals and poorly maintained septic tank systems can also cause water pollution problems.

Groundwater quality in the South East

Around three-quarters of South Australia's groundwater resources are located in the South East. The main conclusions about the groundwater quality are:

- salinity levels are generally rated as poor,
- high nutrient levels are posing a threat to ecosystem health, and
- inappropriate pesticide use has resulted in groundwater contamination.



Taking Action for Water Quality

- Plant native plants that use less water and stop leaves entering the stormwater system.
- Use less garden fertilisers or chemicals and don't use them near drains or watercourses.
- If you live on a watercourse, fence waterways to prevent animals from polluting water and eroding banks and creek beds.
- Get involved with community groups to share ideas about increasing water quality and reducing pollution, visit:

<http://www.sa.waterwatch.org.au> for more information.

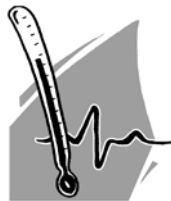
Impacts of Reduced Water Quality



Economic

Decreased water quality has many associated costs, including:

- reduced productivity – the use of irrigation water that has high salinity levels can affect horticultural and agricultural production by affecting plant and soil health,
- damage to infrastructure – high salt content can cause damage to household appliances and industrial infrastructure,
- increased water treatment costs, and
- reduced recreation and tourism activities.



Health

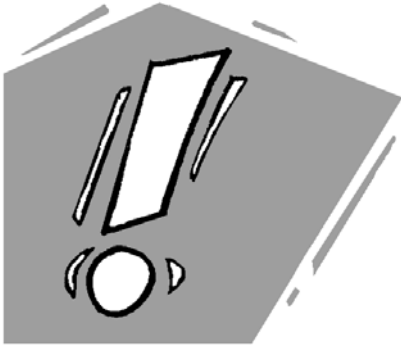
Decreasing water quality has potential impacts to human health. There would be problems if contaminated groundwater were used for drinking water.



Biodiversity

Decreasing water quality will have an impact on the health of aquatic plant and animal communities, particularly pollution from heavy metals, high nutrient and salinity levels and toxic blue-green algae. Deteriorating groundwater quality will have an impact on the ecological communities that rely on groundwater rather than surface water to survive, such as coastal springs.





Attention!!

How do we measure the health of our rivers?

The **Australian River Assessment System (AUSRIVAS)** is the first assessment of river health throughout Australia. The data collected provided the first scientific baseline that we can use to monitor changes in river health over time. Over 600 sites have been monitored in South Australia. AUSRIVAS is assessing river and stream health by monitoring the type of aquatic macro-invertebrates found in a particular river.

Macro-invertebrates are:

- aquatic animals without backbones that are large enough to be seen with the naked eye and include insects, crustaceans, snails, worms, mites and sponges,
- used in biological monitoring studies because they are common, widely distributed, easily sampled and most can be identified by experienced biologists, and
- very sensitive to changes in their environment, so monitoring the type and numbers of these aquatic animals at a particular location over time can provide an accurate and long-term indication of environmental conditions, such as changes in water quality.

“ The Australian River Assessment System (AUSRIVAS) is the first assessment of river health throughout Australia. ”

AUSRIVAS compares the numbers and types of macro-invertebrates found in a particular stream, with those in a stream that has not been disturbed or affected by human activities.



Water Quality



Research Ideas about Water Quality

- 1 What is meant by 'water quality'?

- 2 What factors are used to measure water quality in South Australia?

- 3 How has water quality affected the environment?

- 4 How have human activities impacted on water quality in your community, South Australia, Australia and globally?

- 5 What does the State of the Environment report tell us about water quality in South Australia?

- 6 What might happen in the future if things continue as they are?

- 7 What are government, business and industry doing to address water quality issues?

- 8 What can we do individually, or in communities, to reduce our impact on water quality?

Resources

For more detailed information on the issue and actions you can take see the State of the Environment report for South Australia 2008.

This is available at: www.epa.sa.gov.au/soe



This fact sheet is part of a set of 20 fact sheets about the key environmental issues identified in the State of the Environment report 2008, produced for the Environment Reporting Education Resource. You can access the fact sheets and learn more about taking action for the environment at the Education Resource website: www.epa.sa.gov.au/soe. For more information call the Environmental Education Unit of the Department for Environment and Heritage (08) 8463 3911.



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