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Australian Science Media Centre – Embargoed to 6 pm AEST 6 April, 2007

### Potential impacts

- 2020
  - **Melbourne:** average streamflow is likely to decline 3-11% by 2020
- 2030
  - **Northeast coast:** annual runoff change of -5 to +15%
  - **East coast:** annual runoff change of  $\pm 15\%$
  - **Southeast:** annual runoff decline of up to 20% in the southeast
  - **Tasmania:** annual runoff change of  $\pm 10\%$
  - **Gulf of St Vincent (South Australia):** annual runoff decline of up to 25%
  - **Southwest:** annual runoff change of -25 to +10%.
  - **Burrendong Dam (NSW):** Inflows change by +10% to -30% (90% confidence interval is 0% to -15%).
  - **Victorian catchments:** Run-off in 29 catchments declines by 0-45%
- 2050
  - **Murray Darling Basin:** streamflow drops 10-25% & salinity changes -8 to +19%
  - **Melbourne:** average streamflow is likely to decline 7-35%
- 2070
  - **Burrendong Dam (NSW):** Inflows change by +5 to -35%
- 2100
  - **Murray Darling Basin:** streamflow declines 16-48%, salinity changes -25 to +72%, agricultural costs A\$0.8-1.2 billion.

### Flood and Waste Water Management

Little quantitative information is available about potential changes in flood risk in Australia. Sufficient capacity exists within the Melbourne sewerage and drainage systems to accommodate moderate increases (up to 20%) in storm rainfall totals with minimal surcharging.

For the Albert-Logan Rivers system near the Gold Coast in Queensland, each 1% increase in rainfall intensity is likely to produce a 1.4% increase in peak runoff. If tropical cyclone *Wanda* (which occurred in 1974) occurred in 2050 with a 10-40 cm rise in mean sea-level, the number of dwellings and people affected is estimated to increase by 3-18%.

### Water quality

There are no integrated assessments of the impacts of climate change on run-off quantity and quality, salt interception and revegetation policies, and water pricing and trading policies. One study indicates that there is a 50% chance by 2020 of the average salinity of the lower Murray River exceeding the 800 EC threshold set for desirable drinking and irrigation water.

Toxic algal blooms are likely to become longer and more frequent due to climate change. They can pose a threat to human health, for both recreation and consumptive water use, and can kill fish and livestock.

## Adaptation constraints and opportunities

Significant adaptation is already occurring in the water sector.

Examples of government adaptation strategies to cope with water shortages in Australia.

Gov't	Strategy	Investment
Australia	Drought aid payments to rural communities	A\$0.93 billion from 2001-2006
Australia	National Water Initiative, supported by the Australian Water Fund	A\$2 billion from 2004-2009
Australia	Murray-Darling Basin Water Agreement	A\$0.53 billion from 2004-2009
Victoria	Melbourne's Eastern Treatment Plant to supply recycled water	A\$300 million by 2012
Victoria	New pipeline from Bendigo to Ballarat, water recycling, interconnections between dams, reduce channel seepage and conservation measures	A\$204 million by 2015
Victoria	Wimmera Mallee pipeline replacing open irrigation channels	A\$501 million by 2010
NSW	NSW Water Savings Fund supports projects which save or recycle water in Sydney.	A\$130 million for Round 3, plus more than A\$33 million to 68 other projects.
Qld	Qld Water Plan 2005-2010 to improve water use efficiency and quality, recycling, drought preparedness, new water pricing	Includes A\$242 million for water infrastructure in SE Qld, and A\$402 million to other infrastructure programs.
SA	Water Proofing Adelaide project is a blueprint for the management, conservation and development of Adelaide's water resources to 2025.	N/A
WA	State Water Strategy (2003) and State Water Plan (proposed). WA Water Corporation doubled supply from 1996-2006	A\$666 million spent by WA Water Corporation from 1996-2006, plus A\$386 million for the Perth desalination plant

In future, planned adaptation opportunities lie in the inclusion of risks due to climate change on both the demand and supply side. In urban catchments, better use of stormwater and recycled water can augment supply, although existing institutional arrangements and technical systems for water distribution constrain implementation. Moreover, there is community resistance to the use of recycled water for human consumption (e.g. in such cities as Toowoomba in Queensland, and Goulburn in NSW).

Installation of rainwater tanks is another adaptation response and is now actively pursued through incentive policies and rebates. For rural activities, more flexible arrangements for allocation are required, via expansion of water markets, where trading can increase water use efficiency.