

Diversification of Perth's water supply source through construction of desalination plant

Summary

South-West Western Australia (SWWA) is experiencing a long-term drying trend. Historically, Perth, the biggest city in the region with a population close to two million, has relied on reservoirs for its water supply. However, modelling of future climate of the region suggest further reduction in rainfall, which poses a threat to water security.

To tackle the situation, the water authority that manages water supply in SWWA has worked to diversify its water resources. Two desalination plants have been constructed as a part of a plan to ensure long-term water security in the region.

South-West Western Australia (SWWA) is experiencing a long-term drying trend. Historically, reservoirs have provided Perth's major source of drinking water. However, between 1974 and 1997 rainfall amounts declined by 15% and have continued to decline ever since (see Figure 1).

This decline is attributed, at least in part, to climate change. Typically, rain-bearing fronts that cross the SWWA region from the Southern Ocean between autumn and spring. However, over the last 40 years these fronts have been driven southward off the continent by a warming climate, taking their rainfall with them. The trend is likely to continue into the future (Charles et al. 2012). At the same time, population is projected to grow over the next 10 years, reaching around 2.3 million in Perth by 2026. Declines in natural sources of water, together with population growth, provide a significant threat to water security in the region.

The Water Corporation of Western Australia, the authority that manages water supply in the region, is seeking to diversify water sources, to utilise climate-independent water sources, and to manage water demand. The Integrated Water Supply Scheme (IWSS) water grid enhances overall system robustness (see Figure 2).

Keywords

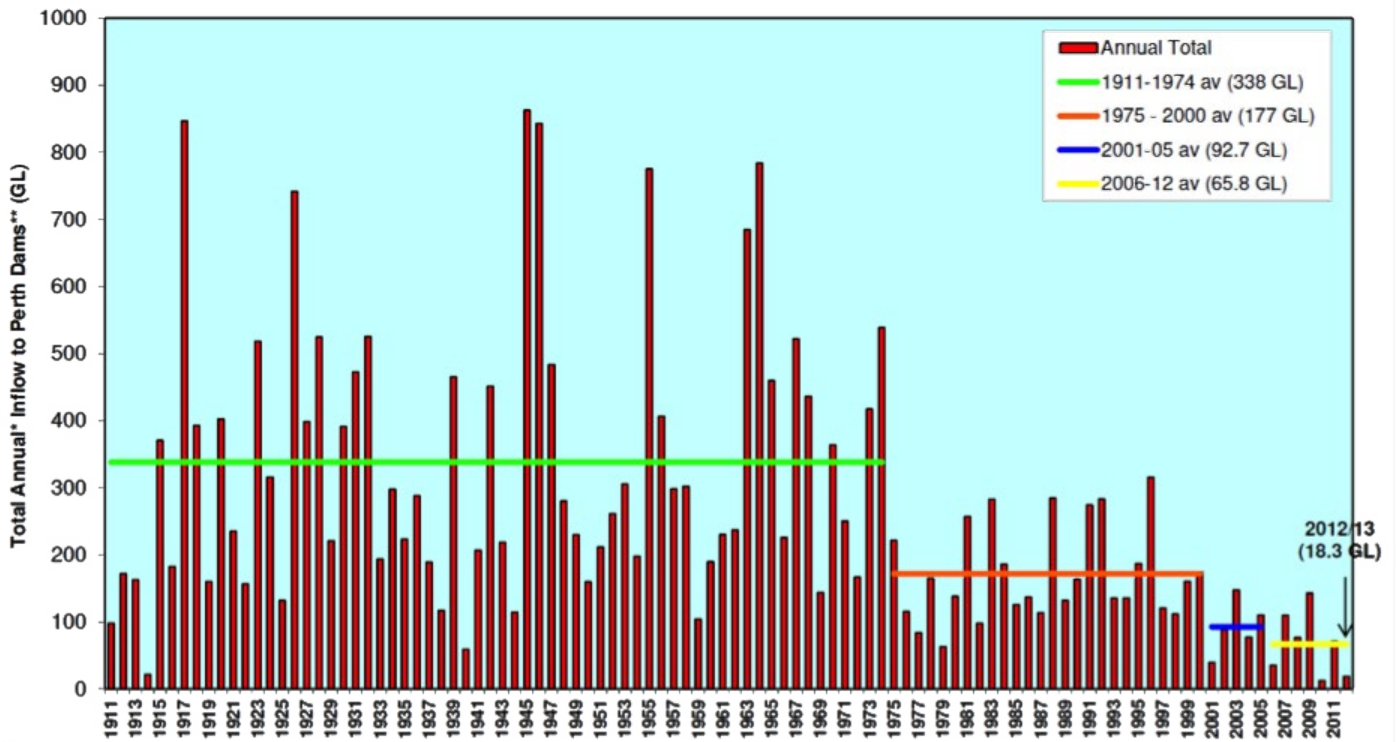
Water security, desalination plant, urban water supply

Two desalination plants have been built, and together these supply close to 50% of Perth's water needs. Other sources, either in use or under investigation, include water recycling, stormwater reuse and deep groundwater. The Water Corporation has produced 10-year and 50-year water plans.

Table 1 shows the diversification of water sources since 2005-6. This diversification comes at a cost: desalinated water is delivered at approximately \$2.20/kL, compared to 20c/kL for water from surface reservoirs. Nevertheless desalination has helped the Water Corporation to build long-term water security for Perth. Possibly a greater challenge lies in ensuring robust and secure water supply to regional towns in SWWA.

Table 1: Sources of water supply in the Perth region.

2005-6	2014-15
50% from surface reservoirs	17% surface water
50% from groundwater	42% groundwater
	41% desalinated seawater



Notes:
 * year is taken as May to April and labelled year is start (winter) of year
 ** Inflow is simulated based on Perth dams in 2001 i.e. excluding Stirling, Samson & Wokalup

8th November 2012

Figure 1: Total annual water inflow to Perth dams between 1911 and 2011. Source: © Water Corporation of Western Australia 2012.



Figure 2: Diversified sources of water under Integrated Water Supply Scheme.
 Source: Water Corporation of Western Australia, www.watercorporation.com.au/-/media/files/teachers/posters/iwss-water-supply-map.pdf?la=en (accessed 25 May 2017).

Reference

Charles, S., G. Fu, and S. Charles, 2012: Indian ocean climate initiative stage 3 (IOCI3) – downscaled climate projections for Western Australia. V2. CSIRO. Accessed 20 February 2017. [Available online at <http://doi.org/10.4225/08/507BA49C04DA1>].

Water Corporation's Water Sources Information. Accessed 20 February 2017. [Available online at www.watercorporation.com.au/water-supply-and-services/solutions-to-perths-water-supply].

Further reading

Desalination in Perth Factsheet. Accessed 20 February 2017. [Available online at www.watercorporation.com.au/-/media/files/teachers/lessons-and-teaching-resources/lesson-plans/activity-sheets-and-factsheets/desalination-in-perth-fact-sheet.pdf].

This Snapshot was prepared by the NCCARF CoastAdapt Development Team. Please cite as:

NCCARF, 2016: Diversification of Perth's water supply source through construction of desalination plant. Snapshot for CoastAdapt, National Climate Change Adaptation Research Facility, Gold Coast.



Australian Government

Department of the Environment and Energy