

Projected climate change impacts on water resources in south-western Australia

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South-western Australia has experienced a 10 to 15 percent reduction in rainfall since 1975 and runoff has progressively decreased to now be only about 20 percent of the long term average. Almost all Global Climate Models (GCMs) project it will be even drier by 2030. We used the output from 15 GCMs to project water yields by 2030 for all surface water catchments and aquifers in the region which is home to about 2 million people. The reduction in surface water yields were projected to continue until supplies to metropolitan reservoirs are expected to prove unreliable. Aquifers proved much more resilient, especially where land had been cleared of perennial vegetation which enabled recharge to continue despite the lower rainfall and greater potential evapotranspiration. Deep confined aquifers have become the main drinking water supply in recent years and these are considered to remain reliable for the near future although storages will decline. Seawater desalination is expected to become the main drinking water supply in the next few years as a result of these major changes in traditional sources. Where water users have access to both surface water and groundwater supplies, the latter is expected to prove the more reliable in future. The reduction in rainfall amounts has been accompanied by a reduction in rainfall intensities so there are low prospects of filling storages in wet periods. Reservoirs are being used to store desalinated seawater that can be efficiently added to the water supply systems due to existing pipe connections. Having a piped system connecting multiple water types and resources may be a method of dealing with climate variability and change.

Biography

Dr. Don McFarlane gained his PhD in hydrogeology at the University of Western Australia in 1985. After a period in the state government where he managed state water policy and planning he took up a position in CSIRO to coordinate the Water for a Healthy Country Flagship in Western Australia. This paper reports work on the South-west Western Australia Sustainable Yields project which he led between 2008 and 2011. In 2004 he was awarded the CSIRO Chairman's Medal for his contribution to the mapping and monitoring of dryland salinity and perennial vegetation.

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