Long-term water resource assessment methodology

The Water Act 1989 requires a long-term water resource assessment every 15 years to assess whether water availability has declined or if waterway health has deteriorated for reasons related to changes in flow.

Long-term water resource assessment

Water sharing arrangements need to be kept up-to-date. The long-term water resource assessment is a formal process to consider whether the impact of a long-term reduction in water availability needs to be shared more equitably, or whether water-sharing arrangements need to respond to a deterioration in waterway health.

It starts with a backwards-looking technical assessment; it examines changes in Victoria’s water resources and waterway health over many years. The assessment is used to determine if water sharing arrangements remain as previously agreed.

How the method was developed

The method for conducting the long-term water assessment was developed by the Department of Environment of Land, Water and Planning (DELWP), with involvement from water corporations, Catchment Management Authorities, the Victorian Environmental Water Holder, external industry specialists, and a technical advisory group.

The technical assessment uses the best available data and modelling to assess long-term water availability and waterway health.

How long-term surface water availability was estimated

Surface water is the water that flows along our waterways and into and out of dams and reservoirs. A variety of methods were used to estimate surface water availability across Victorian catchments, including gauged data, water balances and modelling. The method selected for a particular catchment depends on the availability of the relevant data.

The last calculation of Victoria’s surface water availability was for the SWSs published between 2006 and 2011. These strategies used all historical data available — stretching back to the 1890s for some rivers — to calculate the long-term average water availability.

Climate change is making Victoria warmer and drier, and it’s changing long-standing cycles of high and low flows of rivers. The reference period for the long-term water assessment was changed to be 1975 onwards to better reflect today’s climate.

The assessment also used better data and better models than were available when the SWS estimates were made.

Figure 1. Streamflow measuring equipment
How groundwater availability was estimated

Groundwater is the water stored underground in aquifers. The technical assessment uses groundwater levels as an indicator of any decline in long-term availability. Groundwater-sharing arrangements were last reviewed state-wide in 1997, when caps on entitlements were set in nearly all management areas.

As with surface water, groundwater levels have declined due to climate change and also because of groundwater extraction. The assessment compares water levels prior to 1997 with a current reference period of 1997 onwards to take into consideration the changed climate and the impacts of groundwater extraction since water sharing arrangements were reviewed in 1997.

How the assessment estimated sharing of declines

The technical assessment determines, for each basin, whether declines in long-term water availability have been shared equally between consumptive uses and the environment, or whether declines have fallen disproportionately on one or the other.

The assessment estimated the proportions of long-term water availability for the environment and for consumptive uses both now and when the SWSS last reviewed water sharing arrangements. Sophisticated computer models of water supply systems were used to estimate the proportions of water for the environment and consumptive uses.

The assessment determined that a decline in long-term water availability in a basin has fallen disproportionately if there has been a change in the proportion available for consumptive uses or the proportion available for the environment.

Assessing waterway health

The long-term water resource assessment is the first statewide effort to assess changes in waterway health for flow-related reasons over a long period.

The technical assessment used the available long-term monitoring data on indicators of waterway health. These data sets were examined and statistical methods used to identify whether a deterioration has occurred, and how likely any deterioration is related to changes in flow.

To measure long-term trends this assessment required data sets going back more than 20 years, but waterway health monitoring programs from decades ago were not designed to meet these needs because the assessment did not yet exist. Consequently, only a limited number of indicators relevant to waterway health have been monitored for the long-term period needed. The government’s investment in monitoring waterway health is already improving data collection to inform future assessments of long-term changes in waterway health.

Figure 1. Monitoring fish populations

Join the conversation

We invite you to go online to engage.vic.gov.au/ltwra to provide us with your feedback on the draft technical assessment for southern Victoria. ‘Open House’ events are being held across southern Victoria in October 2019. Everyone is welcome to drop-in to talk about the draft assessment, Sustainable Water Strategies and other water-related projects.