



# South West

groundwater areas allocation plan

## Evaluation statement 2012-2015

This is the second evaluation statement for the Department of Water's 2009 *South West groundwater areas allocation plan*. It summarises how the department has implemented the plan between 2012 and 2015. The first evaluation statement covered the period from 2009-2012. This statement shows that since 2012 the plan has provided an effective framework for managing water resources in this complex groundwater area.

Since the last evaluation we have continued to improve our understanding of how groundwater resources are responding to increasing groundwater use and the drying climate. We have also made significant progress in delivering on the strategies and the objectives of the plan.

Current climate projections show that rainfall is going to continue to decline and that temperatures will increase over the coming decades. These trends are already being recorded in our monitoring data with groundwater levels in our major aquifers falling as a result of groundwater use and lower rainfall.

Managing how water is shared is vital to supporting our regional lifestyles, environments, and economies – including our world renowned viticulture and tourism industries. As part of this, we are working with water users to find innovative ways to share the available water resources, meeting their future needs, and promoting the efficient use of the South West region's valuable water resources. Carefully managing and making the best use of groundwater will ensure we have access to good quality, affordable water supplies and diverse and vibrant environments into the future.



South West plan area

South West plan area



# The South West groundwater system

The South West groundwater area is large, covering approximately 8250 km<sup>2</sup> and includes shallow water table to deep confined aquifers. Major freshwater resources include the Yarragadee and Leederville aquifers.

Groundwater has many uses including public water supply, agriculture, irrigating public open space, industry and mining. Where groundwater is shallow or where deeper aquifers outcrop or discharge, such as in sections of the Blackwood and Margaret rivers, groundwater-dependent ecosystems rely on groundwater for their survival.

We have previously defined a confined aquifer as *'an aquifer lying between confining layers of low permeability strata (such as clay, coal or rock) so that water in the aquifer cannot easily flow vertically'*. This definition has caused some confusion and in the future we will define a confined aquifer as *'an aquifer that is overlain by a confining bed provided it can be reasonably demonstrated that on extracting water from a bore the confining bed extends beyond the predicted radius of pressure drawdown within the aquifer.'*

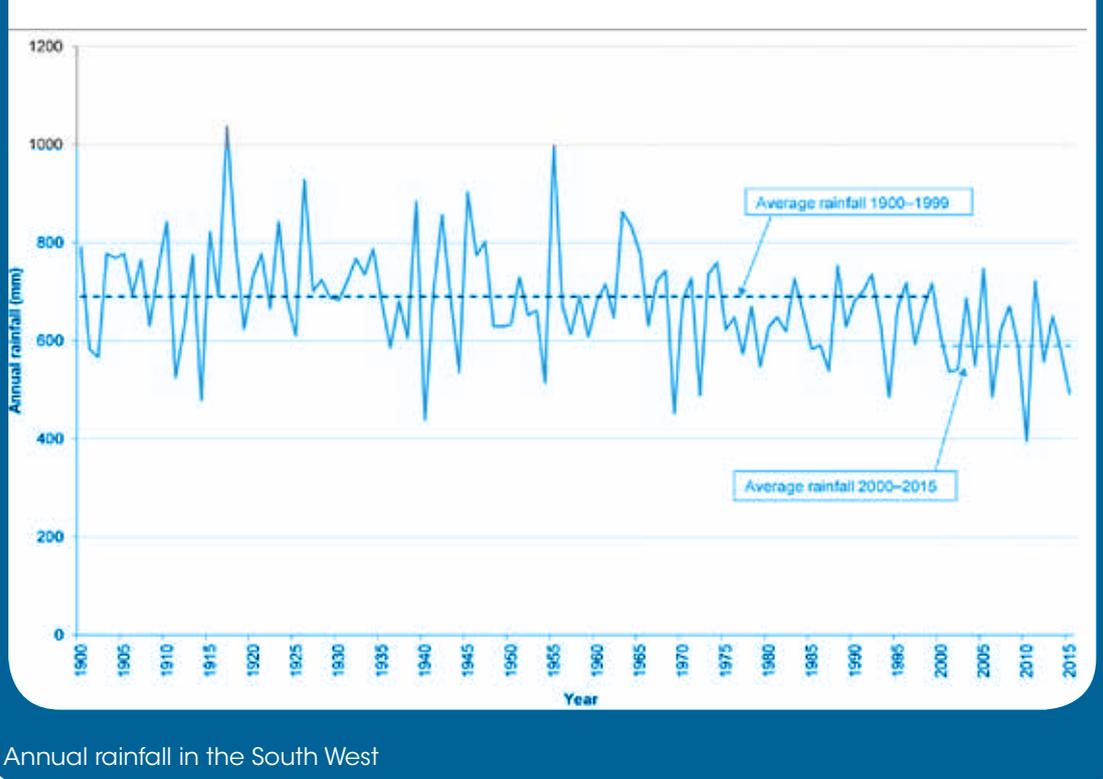
## Improving how we manage water

The main achievements between 2012 and 2015 were:

- Released *Securing water resources for the South West* to inform stakeholders on how we are managing to a changing climate in the South West.
- Partnered with local water service providers to develop their water supply plans for delivering high quality water supplies to the region's towns and cities over the next 50 years.
- Continued to progress the \$1.6 million South West groundwater assessment project made possible by Royalties for Regions. This work includes detailed climate and water resource modelling work that will provide greater certainty for future groundwater availability.
- Initiated the \$5.7 million Myalup-Wellington Water for Food project made possible by Royalties for Regions which includes identifying new water source and land availability options for the Myalup Irrigated Agriculture Precinct – an area where current groundwater level and water quality declines are limiting growth.
- Modernised our groundwater monitoring network by installing continuous data loggers in critical areas, drilling new bores to close data gaps, setting up permanent salt water interface monitoring bores in coastal areas, and replacing aging bores.
- Intensified our monitoring of groundwater-dependent sections of the Blackwood River. This has improved our understanding of groundwater-surface water interactions and the response of river and aquifers to climate.
- Continued to promote efficient water use and innovative solutions to water resource management issues. We are working with local governments to investigate the use of fit-for-purpose water supplies for irrigation of recreational areas and public open space.

| Objective   | Department of Water actions and achievements for 2012–2015  |
|---|---|
| <p>1. To keep the risks from groundwater abstraction to identified ecological, cultural and social values at an acceptable level.</p>             | <ul style="list-style-type: none"> <li>• Continued to monitor groundwater-dependent ecosystems and respond when groundwater level triggers are met by instigating targeted investigations, as committed to in the allocation plan and the <i>South West groundwater areas monitoring program</i>.</li> <li>• Implemented innovative monitoring programs for surface water-groundwater interaction at high value groundwater-dependent ecosystems particularly where groundwater discharge maintains permanent flow.</li> <li>• Developed maps and spatial datasets of social, cultural and environmental values (such as the <i>South West environmental values layer</i>) to support our work. These datasets are now available for stakeholder use through the WA government’s land information system.</li> <li>• Continued to work with stakeholders and improve our understanding of how ecosystems respond to changes in water availability. This included collaborating on: <ul style="list-style-type: none"> <li>- the State Natural Resource Management Strategy project on conserving native fresh water fish in rivers in the South West</li> <li>- development of the national Groundwater Dependent Ecosystems Atlas</li> <li>- a publicly available mapping tool.</li> </ul> </li> </ul> |
| <p>2. To maintain groundwater quality for fit-for-purpose use so that there is an acceptable level of risk to the environment and water users</p> | <ul style="list-style-type: none"> <li>• Required standardised water quality monitoring on groundwater licences in high-risk areas, particularly in the Scott Coastal Plain and the Myalup Irrigated Agriculture Precinct.</li> <li>• Assessed water quality monitoring data for the Myalup Irrigated Agriculture Precinct and identified risks to the Superficial aquifer associated with current groundwater use. We are working with water users to raise awareness and manage these risks through changes to the monitoring and abstraction regimes (where appropriate).</li> <li>• Completed Airborne Electromagnetic surveys and groundwater chemistry investigations in 2014 to define the location of the seawater interface in all aquifers.</li> </ul>  |
| <p>3. To protect the security of supply for water users</p>   | <ul style="list-style-type: none"> <li>• Continued to develop a new South West Aquifer Modelling System (a computer-based groundwater model of the area) using data collected through licensing, monitoring and investigation work. The model will have the capacity to predict both groundwater level and quality trends and will be a critical tool for reviewing future water availability, management and water-sharing arrangements.</li> <li>• Assessed the metering data from around 450 water users and reconciled water used against groundwater level trends as part of our ongoing compliance program. This is helping us adjust our approach to maintaining the groundwater resource and supporting licensees.</li> <li>• Responded to water quality monitoring results in the Myalup Irrigated Agriculture Precinct by adjusting our management to protect the resource, groundwater-dependent ecosystems, and current users. In some areas we are providing temporary access to the public water supply reserves to supplement or offset existing use from the Superficial aquifer.</li> </ul>  |

| Objective   | Department of Water actions and achievements for 2012–2015   |
|---|--|
| 4. To ensure that water users use groundwater in the most efficient way                     | <ul style="list-style-type: none"> <li>• Worked with licensees to ensure efficient groundwater use by promoting best practice management and by facilitating trading in highly allocated resources.</li> <li>• Continued to work with water service providers to set and improve efficiency targets of 100 kilolitres per person per year by 2030, in line with national guidelines. Efficiency gains were made in many areas.</li> <li>• Partnered with local governments and other stakeholders, including schools, to identify fit-for-purpose irrigation options for public and regional open space, and other recreational areas.</li> </ul>  |
| 5. To increase accountability for water use and its associated impacts                      | <ul style="list-style-type: none"> <li>• Conducted more than 1850 checks in the plan area between 2012 and 2015 to assess whether users were complying with their water licences. Of these checks, 426 were on-site audits and 1433 were off-site (desktop) compliance audits.</li> <li>• Issued 160 education letters, 51 warning notices, 43 statutory direction notices, 18 infringement notices and successfully prosecuted one licence holder for illegal activities.</li> <li>• Adopted and implemented the <i>National framework for compliance and enforcement systems for water resource management</i> (Australian Government 2012) with a focus on high risk and fully utilised resources.</li> </ul>   |
| 6. To recover over-allocated water resources  | <ul style="list-style-type: none"> <li>• Continued to implement the local licensing policies in the plan to reduce over-allocation. Options for how we allocate water in the future will be investigated using the new SWAMS. The model will help us to identify areas where overallocation is impacting on the resource and where we need to adjust our management.</li> </ul>  |
| 7. To reserve groundwater for the public drinking water needs for South West communities    | <ul style="list-style-type: none"> <li>• Licensed just over 30 GL/yr of groundwater to water service providers to meet growing demand in local towns and cities.</li> <li>• Worked with the Water Corporation, Aqwest and Busselton Water to complete their water supply plans that project scheme demand, set efficiency targets for water use, and identify supply options for the regions' cities and towns over the next 50 years. Sufficient water is reserved to meet this demand from a number of groundwater resources across the plan area.</li> <li>• Granted temporary access to some public water supply reserves (e.g. the Leederville aquifer in the Kemerton North subarea) for private licensees to facilitate short-term agricultural development. Temporary allocation of parts of these reserves is useful to understand how the resource responds to pumping and how they might be used for future public water supply.</li> </ul> |
| 8. To provide licensees with consistent information on licensing requirements and decisions | <ul style="list-style-type: none"> <li>• Launched the statewide Water Online website to provide a contemporary web-based water licensing system. <a href="https://online.water.wa.gov.au">https://online.water.wa.gov.au</a></li> <li>• Continued to provide advice to prospective and current licensees on water availability, licensing requirements, and compliance.</li> </ul>   |



## Status of water resources

The drying climate in the South West region could result in reduced groundwater and surface water availability, increased seawater intrusion, and a greater risk of impacts of abstraction on groundwater-dependent ecosystems. To monitor these risks, the department collects data from around 690 monitoring bores, 40 stream-flow gauges and 15 rainfall stations. We use this information to assess how the groundwater and river resources are being affected by water use and the changing environment.

Rainfall in the South West is now about 16 per cent less than the long-term average. This climatic trend is set to continue, with almost all global climate models projecting lower rainfall in this part of the state over the coming decades. Reduced rainfall and higher temperatures mean less recharge to groundwater systems.

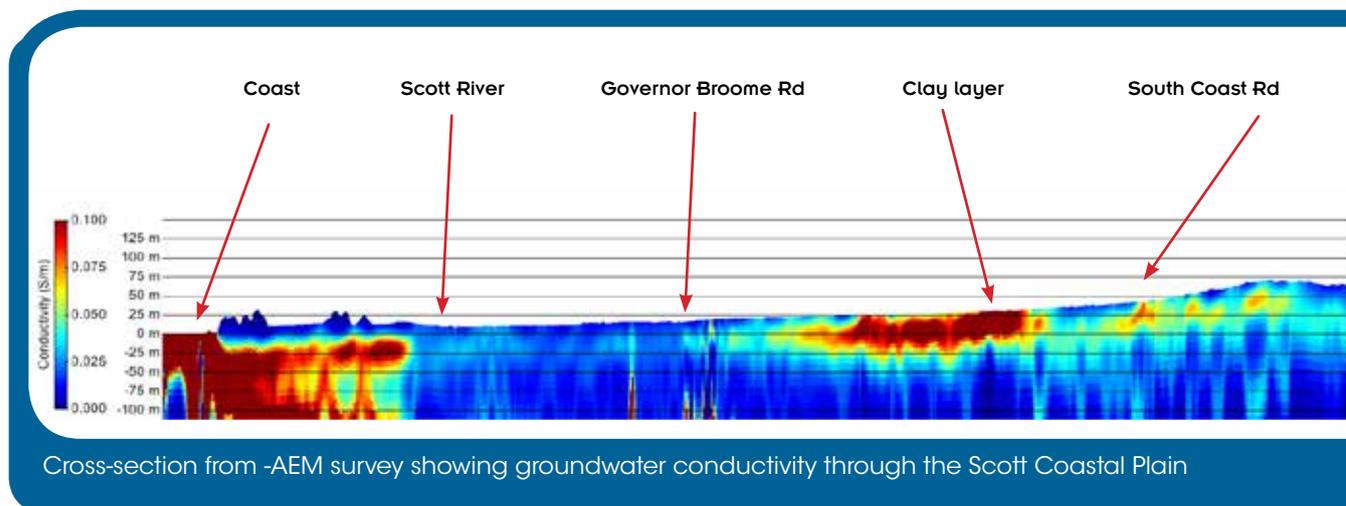
Since the last evaluation in 2012, groundwater levels in the Yarragadee, Sue Coal Measures, Lesueur Sandstone, and Leederville aquifers have continued to decline.

In the Superficial aquifer, groundwater levels have typically remained stable, but there are some localised areas of decline. These trends were caused by a mixture of ongoing groundwater use and lower rainfall. In some areas where there is very little or no water use we have seen declines caused by climate change alone.



Our monitoring has also identified declines in summer flow in some of our river systems including parts of the Blackwood River where the Yarragadee and Leederville aquifers intersect the river. We have investigated the cause of these declines by establishing additional temporary gauging stations in specific areas and conducting annual flow and groundwater monitoring. The monitoring confirmed reduced groundwater flow into the rivers as the cause. We need to manage use carefully in these areas to allow ecosystems the best chance to adapt to the changing climate.

In coastal areas, diminishing recharge and continued use of groundwater means we need to carefully manage the risk of the seawater interface moving further inland and affecting the quality of our freshwater groundwater resources. The airborne electromagnetic data we collected in 2014 has helped confirm the current position of the seawater interface. These results are being used to inform monitoring and licence assessments in affected areas and will be critical information for future revisions of the allocation plan.



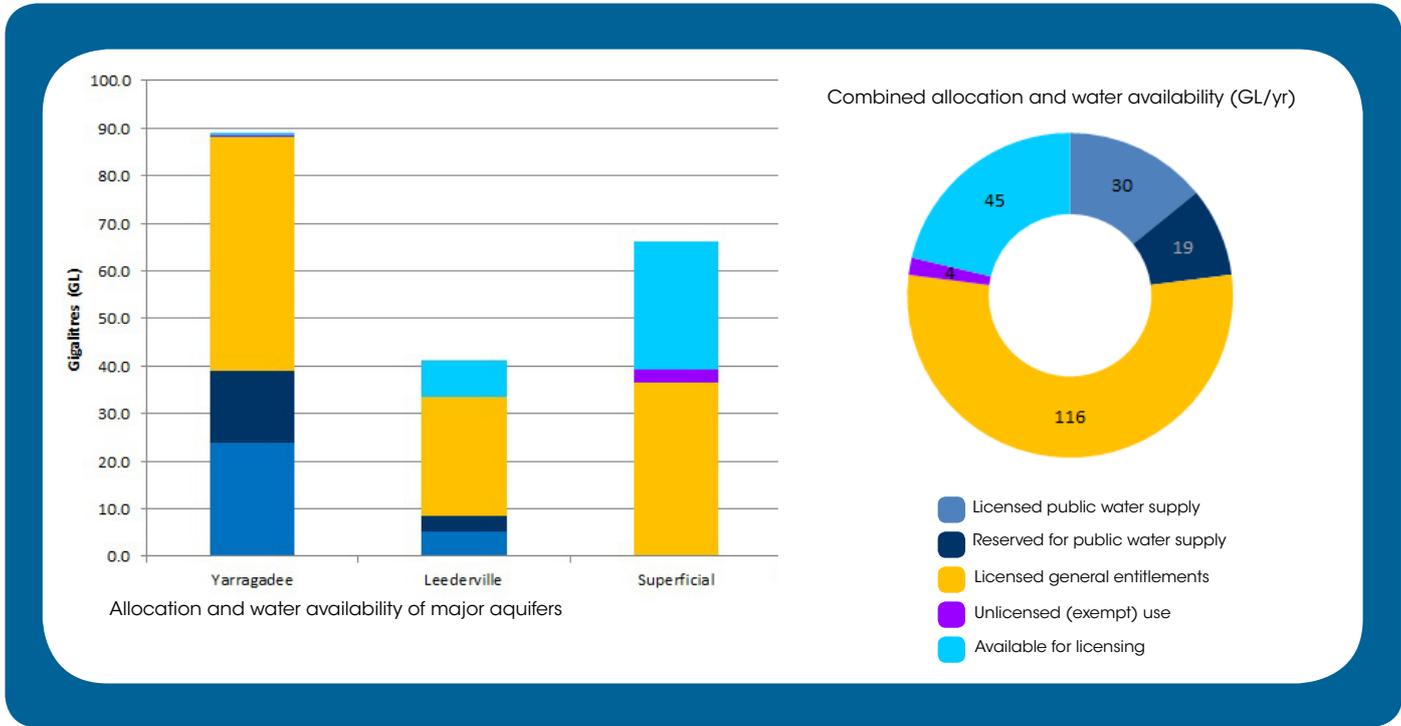
Cross-section from -AEM survey showing groundwater conductivity through the Scott Coastal Plain

## Status of water use

Much of the water available in the South West region (approximately 70 per cent of the total 213 GL/yr allocation limit) is already licensed or reserved for future public water supply. There is currently 44 GL/yr available for licensing for general use. However, this is made up of small volumes spread across the plan area, mostly in shallow superficial aquifers.

In areas that are already fully or over allocated (17 of the 73 groundwater resources), we encourage water users to pursue alternative options for securing water supplies for new and expanding enterprises. This includes making more productive use of current water entitlements, trading entitlements (on a temporary or permanent basis) and temporary licences from public water supply reserves (where available). Up-to-date information on water availability can be found on our water register: [www.water.wa.gov.au](http://www.water.wa.gov.au)

The department's website provides information on what you need to do to trade or transfer your licensed water. The department is restricted by the *Rights in Water and Irrigation Act (1914)* and Regulations (2000) to only providing certain information to the public for trading or transferring water entitlements. In accordance with the Act and the Regulations we cannot provide information relating to the prices paid for trades of water entitlements. Local licensing policy 12.4 of the plan (Table 6, pg. 65) stated that the department would provide prices paid for trades. This is no longer valid, as the department does not determine water trade values and is unable to provide information relating to this matter.



## Public water supply

Our work with the region’s public water supply providers on water supply planning has shown that there is enough water licensed and reserved to meet projected water demands to 2030 and beyond. However, water use efficiency targets still need to be met and additional infrastructure costs are expected to develop and access additional water supply options in the future.

## Water use efficiency and innovation

The department is working with local government and other key stakeholders to assess non-potable urban water demand for public open spaces including sports ovals and parks in the coastal areas between Binningup and Dunsborough. This work will forecast water demand at the local scale and will identify water supply options, including non-potable options, which could be developed to meet the current and future needs. The project is due for completion in early 2017.

Use of non-potable (not for drinking) water supplies, such as stormwater harvesting and wastewater recycling, can be better options than using scheme water for irrigating public parks and recreation areas, particularly in areas where groundwater resources are limited or fully allocated.



## Our response and future planning

The *South West groundwater areas allocation plan* was a strong step in managing this large and complex groundwater system.

We are now preparing to revise the *South West groundwater areas allocation plan*. As part of this, we are considering subdividing the current plan into smaller plans that will focus on localised groundwater management issues. Under this approach, developing a new stand-alone allocation plan for the Myalup Irrigation Area is our first priority.

A key part of revising the current allocation plan will be considering the drier climate to 2030 and the potential impact of lower rainfall on groundwater availability. Our planning will also take account of environmental, social and economic impact assessments and continued consultation with key stakeholders.

This next phase of water allocation planning will use information from:

- The completion of the \$1.6 million South West groundwater assessment project, made possible by Royalties for Regions.
- The completion of our new computer-based groundwater model (South West Aquifer Modelling System).
- Investigations and groundwater modelling completed as part of the \$5.7 million Myalup-Wellington Water for Food project.

In future water allocation planning for the South West we will refine how we manage water licences and the impacts of groundwater pumping on all water users. The new information will be used to set more precise water allocation limits and adapt how we manage the groundwater-seawater interface, and the rivers and wetlands that depend on groundwater. This includes investigating the potential, and developing options, for the recovery of over-allocated groundwater resources.

### Further information

For licensing information, please contact our South West region office in Bunbury.

You can also view the latest water allocation and availability information through our water register available on our website.

If you would like to receive updates on the next *South West groundwater areas allocation plan*, please register your interest by emailing:

[allocation.planning@water.wa.gov.au](mailto:allocation.planning@water.wa.gov.au)



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