Stirling, Australia

Water Smart Parks: Efficiently irrigating parks and gardens

ICLEI Local Governments for Sustainability

The City of Stirling has prepared a Water Smart Parks strategy. This initiative aims at water conservation and identifies priority parks for: Ecozoning and hydrozoning, irrigation system retrofits, soil moisture probes and connecting to a centralised irrigation system.

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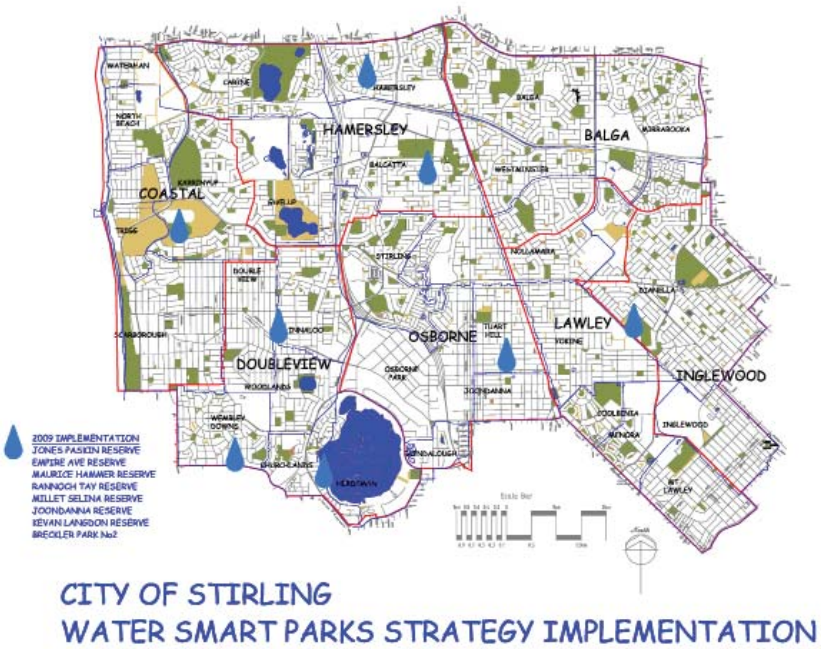
Abstract

The irrigation of parks, gardens and playing fields represents the largest use of water by local governments in Western Australia, constituting in most cases, over half a local government's water consumption. The City of Stirling has prepared a Water Smart Parks strategy which identifies priority parks for water conservation initiatives such as: Ecozoning and hydrozoning, irrigation system retrofits, soil moisture probes and connecting to a centralised irrigation system.

The importance of water conservation

The City of Stirling uses groundwater to irrigate areas of open space and playing fields as is the case with most local governments in the Perth metropolitan region. Western Australia's increasingly dry climate is causing a decline in the amount of water being returned to groundwater aquifers. In addition, the widespread use of groundwater by commercial and private sectors means groundwater levels are rapidly falling, causing changes in wetland hydrological regimes, acid sulphate soils and saline groundwater intrusion.



Population / Land area
199,000 in 2009 (approximately)

Land area
100km2

Municipal budget
- 2009/10 City of Stirling overall budget: $192,365,008 USD
- Parks and Reserves budget expenditure: $19,330,893 USD

Water Campaign®

The City of Stirling has been a participant of ICLEI Oceania's Water Campaign™ since 2007.

Case Study

Challenges to the Water Smart Parks program

Funding

The strategy has been implemented in gradual stages over a number of years since the City of Stirling was unable to fund a complete, one-time overhaul of the water management system.

Community understanding

The community expects parks and reserves to appear dark green in colour, however reduced irrigation under the Water Smart Parks strategy means parks appear less green. After educating the community through newspaper articles and brochures, there is now a better understanding of why certain parks and reserves have a different appearance.

The city context

The City of Stirling is one of over 30 municipalities that form Western Australia's capital city, Perth, located in the state's south-west corner. Stirling, which has the largest population of all local governments in Western Australia, stretches across thirty suburbs and is located approximately eight kilometres north of Perth's central business district. The city's rich and diverse landscape comprises 627 hectares of parks, gardens and developed reserves as well as 500 hectares of natural bushland and six kilometres of coastline.

Stirling sets standard for water conservation with "Water Smart Parks"

The irrigation of parks, gardens and playing fields amounts to the largest use of water by local governments in Australia, constituting, in most cases, over half a municipality's water consumption. Stirling uses groundwater to irrigate open spaces and playing fields, as is the case with the majority of local governments in the Perth metropolitan region,

The City of Stirling recognises the need for local governments to do everything in their power to protect groundwater supplies. The City of Stirling also has been a participant of ICLEI Oceania's Water Campaign™ since 2007. The city, which operates what is arguably the largest irrigation system in Western Australia – if not the whole of Australia – is setting a new standard for appropriate watering techniques through its Water Smart Parks strategy. Stirling is aiming to strengthen the three pillars of sustainability in its community – social development, environmental protection and economic development. Achieving sustainable use of groundwater resources is part of the city's sustainability-minded outlook.

The majority of the city's parks and reserves are maintained through an extensive irrigation system comprising 360 bores (a type of hole), which cover 740 hectares of irrigated areas over 450 parks and reserves.

The Water Smart Parks strategy categorises parks and reserves as 'ecozones' or 'hydrozones'.

Photo 1

Photo 2

Photo 3

Photos 1-6: Hydrozoning is reflected through the active area in the middle (dark green area) which received more irrigation per which have native tree and shrub plantings (surrounding areas). *Photos: City of Stirling*

Zone categories

Zone 1: High quality of lawn for areas such as sports/ recreational turn and playing fields.

Zone 2: Informal recreational parklands e.g. barbeque, playground and non organized play areas.

Zone 3: General parkland e.g. walking and dog exercise areas.

Hydrozones: Irrigated according to reserves/park use.

Ecozones: Irrigated turf is converted to areas where water usage is reduced and water wise (drought-resistant) plants are used. These plantings are in line with Western Australia's natural environment including a range of landscape features to accommodate watering regimes e.g. trees, shrubs, grassed areas, and mulch.

These zones may have different watering needs, depending on how much they are used, which results in an overall reduction in watering needs. Under this plan, the city will prioritize irrigation based on reserve and park use to ensure water expenditure remains within licensed limits. This approach of modifying irrigation patterns means Water Smart Parks may appear slightly less green than they were previously.

The Water Smart Parks program is the first stage of the Stirling's broader Groundwater Conservation Strategy, which addresses the implications of climate change on the city's groundwater supply, while also reducing the use and costs of water. The Strategy operates in association with the Public Open Space Strategy Review, which was jointly undertaken by Parks and Reserves and the Recreation and Leisure Services Business Units.

The Water Smart Parks strategy is endorsed by the City of Stirling and the Department of Water. It also integrates with the city's plan to build a centrally controlled irrigation management system linking soil moisture probes and weather stations.

Results and community impact

- The primary benefit of the Water Smart Parks strategy has been significant groundwater savings.
- Each year, the Western Australian Government Department of Water allocates a total of 5,226,750 kilolitres of groundwater to Stirling. Analysis of 2006/07 data showed that the city was exceeding its groundwater allocation by over 22 percent. This amount lowered to 12.5 percent in 2008 – 2009 following the implementation of the Water Smart Parks strategy.

Photo 4

Photo 5

Photo 6

week compared to the passive, non-active area (olive green area). Ecozones are reflected in the portions within hydrozones

Additional benefits of Water Smart Parks

- Reduced power consumption;
- reduced fertiliser use;
- creation of natural/ wildlife habitat as ecozones have introduced local plants which encourages wildlife back into the area;
- increased biodiversity of the area as a greater number of plants and wildlife are now present;
- use of local plants which enhance the 'sense of place' as previously the area was irrigated turf so there were no plants necessarily in that area. So when converted, the City decided to use local water wise plants to enhance the area;
- enhancement of remnant bushland ;

- Reductions in 2009-2010 are even more positive with the city consuming only 84 percent of its yearly groundwater allocation – 841,506.75 kilolitres below the annual groundwater allocation.
- Overall, in 2009-2010 Council reduced its total water usage by a quarter of the 2008-2009 total.
- The Jones Paskin Reserve, which has an annual allocation of 24,750 kilolitres of groundwater, has benefited enormously from the Water Smart Parks strategy. In 2008/09, prior to the new irrigation system, the reserve exceeded its yearly allocation by 64 percent in 2008-2009. In 2009-2010, after implementing the Water Smart Parks strategy, the reserve consumed only 77 percent of its annual allocation – a saving of 5,767 kilolitres of groundwater.
- The City of Stirling won the 2009 Western Australia Environment Award for the Water Smart Parks strategy, in the category of "Government Leading by Example".

Lessons learned

By implementing the Water Smart Parks strategy, the city has learned the following:

Consultation with all stakeholders is imperative to ensuring that all aspects of the proposed strategy are addressed.

Community education funds are required for publicity and promotion of this strategy.

Research is essential to ensuring that the best possible strategies are integrated with other projects and contribute to a common goal The Water Smart Parks strategy worked well as a **gradual effort** performed in stages rather than attempting to implement it all at one time.

The Water Smart Parks strategy requires **greater management and administration** of parks and reserves as it involves specific water allocation to reserves with different zones.

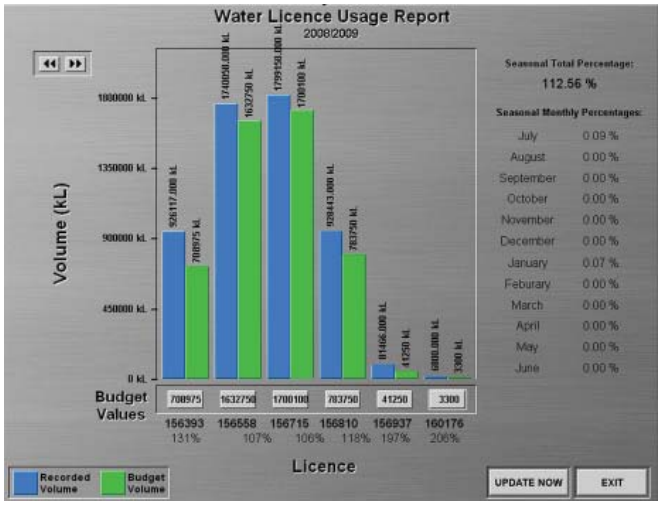
The Water Smart Parks strategy necessitates a **change in turf management practices.** Due to the different precipitation rates, maintenance strategies vary greatly such as mowing heights, fertilising and application of wetting agents.

All future **park and reserve designs** in Stirling will take the Water Smart Parks strategy into consideration.

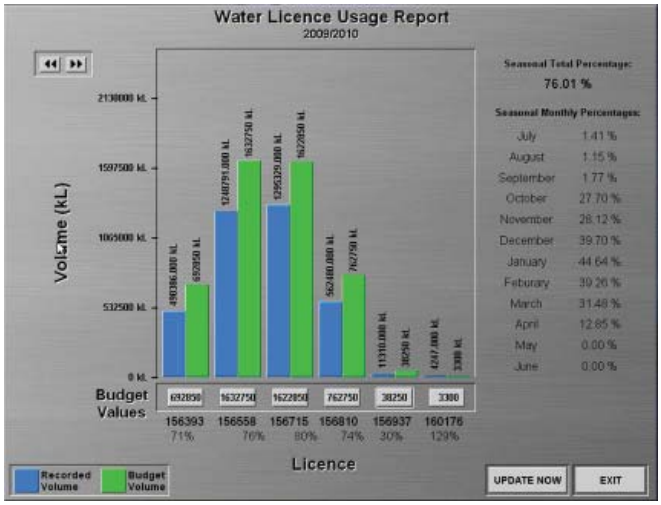
The City of Stirling's weather station (left) works in conjunction with soil moisture probes (right) to allow the city to plan for a centrally controlled irrigation management system. The system can then make its own decision about how much water to apply in relation to climatic connditions. *Photos: City of Stirling*

Replication

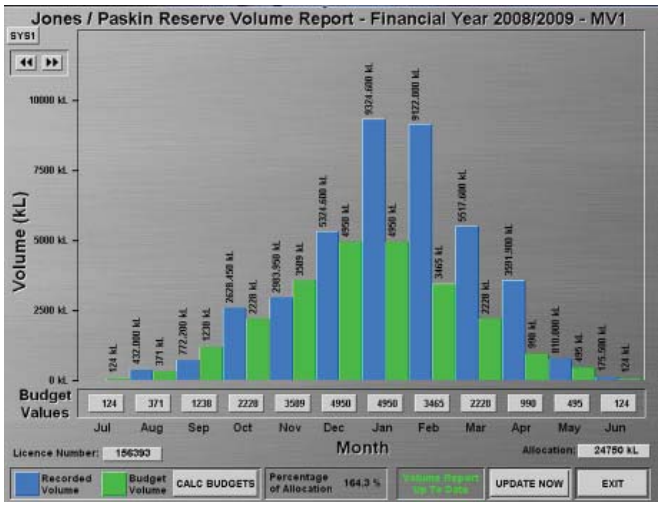
This approach is highly replicable for municipalities which have responsibility for managing large parks and gardens. The Water Smart Parks strategy provides a logical framework for ensuring that *priority* parks and gardens are the first to be hydrozoned and ecozoned.



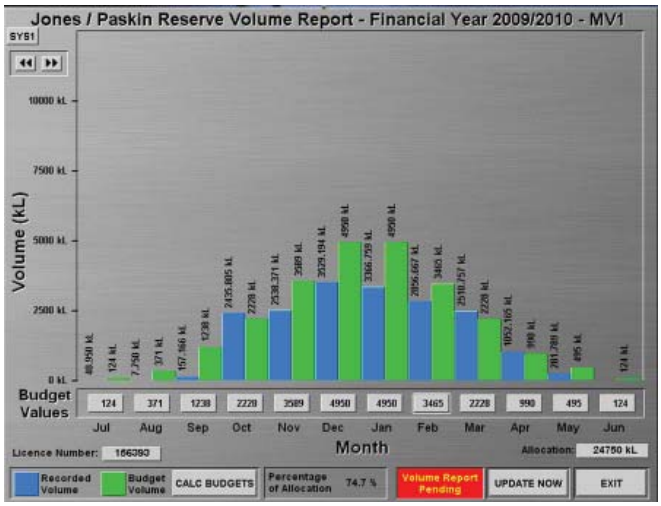
Water Licence Usage Report 2008-2009: This graph shows the Water Licences allocation by the Department of Water and the amount of water consumed by the City of Stirling. The city exceeded its allotment by 12.56%. in this period.



Water Licence Usage Report 2009-2010: This graph shows that the city used only 83.9% (4,386,805.12 kilolitres) of its water licences allocation for 2009/2010.Water Smart Parks has exceeded expectations and provided huge water savings.



Jones Paskin Reserve Volume Report 2008-2009: This graph shows the city was 64% over its annual water allocation before new irrigation system was implemented.



Jones Paskin Reserve Volume Report 2009-2010: This graph shows the reserve used only 74.7% of its yearly water allocation after implementing the new irrigation system in 2010.

Budget and finances

Stirling received funding from the Parks and Reserves Capital Works Budget and additional funding was obtained through a Community Water Grant from the Australian Government Water Fund.

The city conducted an evaluation of the Jones Paskin Reserve and compared the traditional irrigation system to a design based on the Water Smart Parks strategy. This evaluation showed that the Water Smart Parks irrigation system would cost 15 percent more than the traditional irrigation system: 20,300 Euros (29,000 AU) per hectare rather than 17,500 euros (25,000 AU) per hectare. However, these costs are minimal, considering how much water is conserved.

Key contacts

City of Stirling
Parks and Reserves Team
Stirling, Western Australia
Tel: +61-8-9345/8555.

ICLEI Oceania
Level 5, 200 Little Collins Street
Melbourne Vic 3000
Australia
Tel: +61 (0)3 9639 8688
Fax:+61 (0)3 9639 8677
www.iclei.org/oceania
www.iclei.org/oecania/water

ICLEI World Secretariat
Capacity Centre
Kaiser-Friedrich-Strasse 7
D-53113 Bonn, Germany
Tel: +49-228/ 976299-00
Fax:+49-228/ 976299-01
Email: capacity.center@iclei.org
www.iclei.org

Sources

- Urban Bushland Conservation Strategy (Green Plan2)
- Ground Water Conservation Strategy
- Dr. David Deely Presentation, Bore Audit, Hydrozones and Ecozones, etc.
- Local Biodiversity Strategy
- Million Trees Initiative (Council Endorsement/Resolution)
- Public Open Space Strategy

Acknowledgements

- Contributions: Several City of Stirling Officers were involved in supplying information for this ICLEI Case Study: Megan Turner, Business Support Officer; Kevin Zoccoli, Irrigation Services Supervisor; Sam Morrison, Manager Parks and Reserves.
- Author: Don Low, City of Stirling Senior Irrigation Officer, Editor: Emma Wadland, ICLEI World Secretariat.

City of Stirling
City of Choice

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