5 Secure and sustainable supplies of water, and water is used more wisely

Photo: R. Thomas

Through the NSW Office of Water, DECCW is leading policy and reform in sustainable water management and assisting water utilities to provide urban water and sewerage services that benefit all NSW.

Context

A major challenge for the NSW Government is to balance the water needs of farms, towns, industries and the environment when drought across parts of NSW means continuing water shortages in many regions. There is also the prospect of climate change leading to lower water availability. At the same time, population growth in metropolitan, coastal and some regional centres is increasing demand for water.

In recent years, NSW has suffered the worst drought on record, which poses significant problems for agriculture and regional communities. Studies indicate that climate change may mean existing models of water supply will be less accurate, and may also decrease the reliability of supplies for both irrigation and town water in some regions. The impacts of both climate change and natural climate variability on wetlands, riparian environments and groundwater-dependent ecosystems also need to be studied and managed.

A key issue is whether there is enough flexibility in water infrastructure and water management institutions to successfully manage water supplies in much drier conditions. The continued development and implementation of statutory water sharing plans are helping to ensure that surface water and groundwater are shared equitably among communities. Adaptive water management strategies based on the best available science are being developed, and additional investment is being encouraged to develop new options to increase the supply of water and reduce demand.

The Australian Government's National Water Initiative has significant implications for water management in NSW. There are potential changes to some existing water sharing plans, resource management in the Murray-Darling Basin, the management and operation of rivers, metering and monitoring, and compliance and enforcement. First steps for the Murray–Darling Basin involve the Australian Government making an assessment of what the national approach should be, and preparing a basin-wide strategic plan.

Reforms are already being implemented to facilitate competition and encourage the participation of the private sector in water markets, and to ensure that efficient and affordable water services are delivered to consumers. The *Water Industry Competition Act 2006* and associated regulation and reforms are refining the regulatory framework for delivering recycled water and supporting innovation and investment by the private sector.

Effective conservation and education programs can lead to significant demand reductions. Despite an extra one million people, Sydney uses the same amount of water as it did in 1974, due in part to water efficiency programs.

DECCW, through the NSW Office of Water, will continue to facilitate water conservation and education, encourage water recycling initiatives, promote effective urban water planning, and encourage the development of water supplies through the use of new technologies.

Outcomes

- Balancing the water needs of the environment and water users in regional and metropolitan NSW for long-term secure and sustainable water use
- Overseeing, guiding and assisting water utilities to provide urban water and sewerage services that are well managed, efficient and equitable across NSW.

Key drivers

- NSW State Plan (www.nsw.gov.au/stateplan/)
- *Water Management Act 2000* (www.legislation.nsw.gov.au)
- *Water Industry Competition Act 2006* (www.legislation.nsw.gov.au)
- Metropolitan Water Plan (www.waterforlife.nsw.gov.au)
- National Water Initiative (www.nwc.gov.au)
- *Water Act 2007* (Commonwealth) (www.comlaw.gov.au)
- Intergovernmental Agreement on Murray–Darling Basin Reform (www.coag.gov.au)

Performance indicators

- Proportion of water extraction covered by water sharing plans
- Proportion of *Water Act 1912* licences converted to tradeable water access licences under the *Water Management Act 2000*
- Volume of water recycled in Sydney
- Volume of water saved in Sydney
- Percentage of requirements of best practice management guidelines met by local water utilities

Photo: S. Cohen, DECCW

Balancing the water needs of farmers, towns, industries and the environment

The National Water Initiative

The National Water Initiative is a comprehensive strategy being implemented by the Australian Government to improve water management nationwide. The NSW Government is a partner in the initiative, which was endorsed by the Council of Australian Governments (COAG) in 2004. The key aims are to:

- expand the permanent trade in water to enable its more efficient use and recovery, to achieve environmental outcomes
- encourage investment in the water industry through more secure water access entitlements and improved access to information
- make water planning more transparent and comprehensive to deal with the interaction between surface water and groundwater systems and the provision of water to meet specific environmental outcomes
- address over-allocated river systems as quickly as possible, in consultation with affected stakeholders, and manage adjustment.

In 2009–10, DECCW's NSW Office of Water, with other state agencies, drafted the National Water Initiative Policy Guidelines for Water Planning and Management, and submitted these to COAG for approval. The guidelines address and clarify critical issues such as over-allocation, over-use and sustainable water extraction. They will also help water planners across Australia implement principles for best-practice water planning which deal with intercepting and storing overland flows, constructing farm dams and bores, planning large-scale plantation forestry and mining, and developing further water sharing plans across Australian states and territories that are consistent with the National Water Initiative.

The NSW Office of Water has been further developing water accounting, including a national stocktake report (the Water Accounting Development Project, sponsored by the National Water Commission, see www.nwc.gov.au/www/html/243-water-accounting.asp?intSiteID=1), and helping the Bureau of Meteorology to develop national water accounts each year.

Murray-Darling Basin governance arrangements

The Murray–Darling Basin is one of Australia's major water catchment and drainage regions, extending over much of NSW and Victoria, all the Australian Capital Territory, and parts of South Australia and Queensland. About 75% of NSW – including nearly all land west of the Great Dividing Range – lies within the basin, and around 57% of the basin lies within NSW.

The Murray–Darling Basin Authority, administered by the Australian Government, is responsible for developing a basin-wide plan that will set a sustainable 'cap' on extractions from both surface water and groundwater sources. During 2009–10, the NSW Office of Water provided information and water modelling details for the plan. A consultation draft is expected to be released later in 2010, with a view to commencement in 2011.

As the basin plan is expected to require significant reductions in extraction limits once finalised, the NSW Office of Water will need to re-make a number of NSW water sharing plans.

The Authority will also prepare an environmental water management plan, and develop and implement basin-wide water trading rules. During the year, the NSW Office of Water negotiated extensively with the Australian Government on the water trading rules being developed by the Australian Competition and Consumer Commission under the *Water Act 2007* (Commonwealth).

Water for the Future

To support the national water reforms, and particularly the expected water management changes in the Murray–Darling Basin, the Australian Government has committed $12.9 billion to its Water for the Future program to take action on climate change, use water wisely, secure future water supplies and support healthy river systems, of which $3.1 billion will be used to buy back water licences and $5.8 billion will be used for rural water use and infrastructure projects in the Murray–Darling Basin.

Commonwealth water licence buy-backs

In response to concerns that the Australian Government was purchasing a disproportionate amount of NSW water entitlements, a memorandum of understanding was agreed to in September 2009. Under the agreement, the Australian Government will purchase no more than 890 gigalitres of general security entitlement (or equivalent) in NSW by 2013. This limit represents almost 15% of the state's general security entitlement. As at June 2010, the Australian Government owned 568 gigalitres of licensed water entitlement from NSW, as well as 247 gigalitres from Victoria, 41 gigalitres from South Australia and 7 gigalitres from Queensland.

During the year, negotiations occurred with the Australian Government on the procedures and arrangements for 'water shepherding' – that is, transferring water from one system to another, and protecting it from extraction. The Australian Government requested that the NSW Government transfer environmental water allocations over 1,300 kms from the Warrego River through Menindee Lakes to the Murray River, through three river systems. The NSW Office of Water had to assess the water losses involved and ensure the rights of other water users were not affected. As a result, some 8,000 megalitres of water was made available to the Australian Government in May and June 2009 to allow for the watering of six environmental sites along the Murray River, followed by a further 3,700 megalitres in May 2010.

Infrastructure projects

Under the Murray–Darling Basin agreement, the Australian Government has approved the allocation of $1.358 billion to the NSW Government for various infrastructure projects. Components of this funding for proposed projects that will be managed by the NSW Office of Water include:

- up to $137 million for projects that reduce river losses by converting open domestic and stock supply systems to pipes
- up to $221 million to upgrade the accuracy of water metering (jointly with State Water Corporation)
- $50 million to licence floodplain extractions and improve the management of water on floodplains, including by modifying floodplain structures.

Detailed business cases for all NSW Government projects were submitted to the Australian Government in June 2010.

Water sharing plans

DECCW, through the NSW Office of Water, is working to have all inland water sharing plans completed by the time the Murray–Darling Basin Authority's basin plan commences in 2011. During 2009–10, five further water sharing plans commenced – the NSW Border Rivers (regulated), the Lower North Coast (unregulated and alluvial), the Hunter (unregulated and alluvial), the Central Coast (unregulated) and the Coffs Harbour Area (unregulated and alluvial). This brings the number of water sharing plans commenced to 49. A further plan for the Peel Valley (regulated, unregulated and groundwater) was finalised during the year and will commence early in 2010–11. Significant work has progressed on all remaining inland water sharing plans.

It is expected that 84 water sharing plans will be developed to cover the entire state, although this number may change as planning progresses. The broader aim is for all NSW plans to be completed by 2012, which would bring all water users within the licensing system set out under the *Water Management Act 2000*, providing more secure water entitlements, opportunities for water trading, and specific rules to protect the environment.

To develop water sharing plans for the remaining, mainly coastal river systems, expert regional panels have been convened to assess the environmental and socioeconomic values of the river systems and develop draft water sharing rules. These rules are discussed with key stakeholders before draft plans are prepared for public exhibition. During 2009–10, draft plans were released for public comment for the Tweed River, Richmond River, Murrah–Wallaga Lakes, Towamba, Bega–Brogo and Peel areas, and in the Greater Metropolitan Region.

Implementing water sharing plans

The NSW Office of Water is responsible for monitoring water availability and determining annual water allocations under water sharing plans.

In 2009–10, drought continued across much of inland NSW, although flooding in the north-west occurred over Christmas–New Year, providing substantial inflows to the Menindee Lakes storages.

In the southern inland valleys, conditions remained dry. In the Murrumbidgee valley, for example, flows continued at low levels, but were higher than in the record dry year of 2006–07. Although early in the year the region had limited water allocations for high-security users and no general security allocations, the Murray and Murrumbidgee valleys ended the year with full high-security allocations and some general security allocations.

In the Lachlan valley, however, the situation remained critical throughout the year with only 10% of high-security allocations provided. The NSW Office of Water worked closely with local water advisory groups to determine priorities and options for water supply in critical water shortage areas; to ensure supply to towns, essential industries and rural properties for domestic use and stock; and to ensure the survival of permanent plantings.

Some environmental releases were made with the limited water available, as the flow rules are designed to replicate natural flow conditions as far as possible. For example, 19,000 megalitres were released for the Macquarie Marshes between August and December 2009, which, combined with good rainfall over Christmas, allowed some lagoons in the northern marshes to fill for the first time since 2003.

Critical water planning

Where extraordinary measures need to be taken, critical water planning communiqués are issued by the NSW Office of Water that outline water resource availability and how it is being shared. Communiqués are available on www.water.nsw.gov.au/Water-management/Water-availability/Critical-water-planning/Critical-water-planning/default.aspx.

■ PERFORMANCE INDICATOR

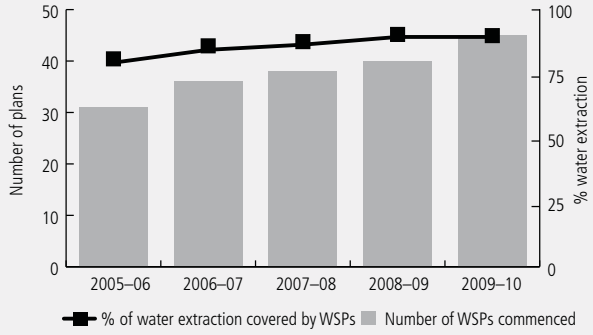
Proportion of water extraction covered by water sharing plans

Definition: For river and groundwater systems to be healthy and productive in the long term, it is critical to balance the competing needs of the environment and water users. A water sharing plan (WSP) is a legal document prepared under the *Water Management Act 2000* that establishes rules for sharing water between the environmental needs of a river or aquifer and water users, and also between different water uses such as town supply, rural domestic supply, stock watering, industry and irrigation.

By setting rules for how water is allocated for the next ten years, a WSP provides a decade of security for the environment and water users, ensuring that water is provided for the environment through a legally binding plan, and licence holders such as irrigators can better plan their business activities. Irrigation accounts for about 80% of all water used in NSW. In addition, WSPs set rules for water trading (that is, the buying and selling of water licences or annual water allocations).

This indicator measures the cumulative number of plans that have formally commenced and the cumulative proportion of water extraction across NSW covered by commenced water sharing plans.

Proportion of water extraction covered by water sharing plans



Interpretation: Five new WSPs formally commenced in 2009–10, bringing the total number of WSPs in operation across NSW to 45. This represents around 54% of the WSPs that are expected to be developed. The plans currently cover 90% of the total volume of water extraction.

Most of the water volume extracted is from major river systems and alluvial groundwater aquifers. As the WSPs for these were commenced some years ago, and the five plans commenced in 2009–10 were for smaller areas, the total water volume extracted covered by WSPs did not significantly change in 2009–10.

Photo: S. Horn, DECCW

Water licensing officers inspecting infrastructure at Bathurst.

In July 2009, storage levels in Wyangala Dam were the lowest in history for the start of a year. Also during the year, the situation in the Lachlan was so critical that supplies were halted for a period to ensure town water could be provided. Fortunately, rainfall over Christmas eased the situation, and flow along the length of the Lachlan River was re-instated.

Performance against Murray–Darling Basin cap

A key provision of water sharing plans is the limit placed on water extractions, which is determined by the environmental flow rules and, in the inland river systems, by the Murray–Darling Basin cap on water diversions. Each year an Independent Audit Group (IAG) reviews the implementation of the Murray–Darling Basin cap in each state.

In 2009, the IAG assessed all NSW valleys as being within the basin cap, except for the NSW Border Rivers and the combined Barwon–Darling and lower Darling valleys. Following the signing of an inter-governmental agreement with Queensland on flow sharing arrangements for the Border Rivers, the IAG is considering a proposed cap for the NSW Border Rivers. For Barwon–Darling water users, there was a further reduction in annual water availability in 2010, with new limits on water use over three years. A water sharing plan for the Barwon–Darling valley is being developed, and further changes to management arrangements will be addressed through this process.

Since the introduction of Murray–Darling Basin cap reporting in 1997–98, the NSW Government has managed its extractions so that it is, cumulatively, more than 2,000 gigalitres below the cap. The IAG review of Murray-Darling Basin cap implementation for 2009–10 will take place in September 2010.

Water rights and trading

Water licensing and trading are managed under two Acts. Where a water sharing plan has commenced, licences and approvals are managed under the *Water Management Act 2000*. Licences to extract water outside these areas are still managed under the *Water Act 1912*.

Licensing and approvals under the *Water Management Act 2000*

For water sources where water sharing plans have commenced, *Water Act 1912* licences are converted to water access licences issued under the *Water Management Act 2000*, which are then listed on a Water Access Licence Register administered by the Land and Property Management Authority (see www.lands.nsw.gov.au/land_titles/public_registers/water_access_licence_register).

Water access licences provide a clearly defined share of the available water from a particular water source that can be sustainably extracted. They also provide a clearly defined entitlement that is separate from land ownership and that can be bought or sold or used as collateral when seeking finance. As of 30 June 2010, there were 20,296 water access

licences listed on the Water Access Licence Register. In areas where water sharing plans have commenced, there were 106 access licences still to be listed.

Licensing under the *Water Act 1912*

Licences issued under the old *Water Act 1912* are generally tied to the land, as the licence covers both the right to take a specific volume of water as well as the works to be constructed and operated to use that water. There were 11,257 surface water licences and 87,368 groundwater (bore) licences managed under the *Water Act 1912* as at 30 June 2010.

Although fewer licences are administered under the *Water Management Act 2000* than under the old Act, the newer licences cover most of the large areas of extraction. About 90% of water extraction in NSW is now managed under the new Act.

Water trading

The market for tradeable water entitlements promotes more productive and efficient uses of water, and assists entitlement holders to adjust to changes in product markets and water availability.

The Water Management Act 2000 provides for water trading (i.e. the buying and selling of licences or annual water allocations) and changes to water access licences (e.g. changing category, subdividing, or nominating work under the licence).

A permanent trade occurs when the licence holder trades the ongoing share of available water. This may involve the transfer of a whole water access licence to another party or the sale of a part of the licence share. Temporary water trading can occur when the licence holder buys or sells a volume of the year's allocation.

In 2009–10, there were 1,246 permanent transfers undertaken under the *Water Management Act 2000* in NSW, totalling 1,063,079 share units. This does not include trades within irrigation corporations, private irrigation districts and irrigation trusts.

The total number of temporary trading activities for water sources subject to water sharing plans was 4,757 trades totalling 1,202,168 megalitres.

Under the *Water Act 1912*, there were no permanent transfers recorded during 2009–10. There were 15 temporary transfers of surface water involving 699 megalitres, and no temporary transfers of groundwater.

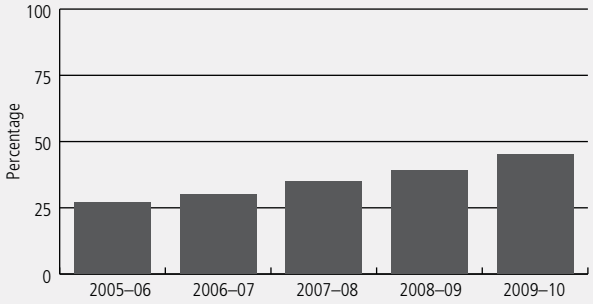
The NSW Office of Water provides information for water users and members of the public about water access licences and approvals managed under the *Water Management Act 2000* (see www.water.nsw.gov.au/Water-licensing/Registers/default.aspx). During 2009–10 there were 11,085 online searches of the register. There were 2,931 dealings lodged, including 783 permanent transfers of holder and seven term transfers.

■ **PERFORMANCE INDICATOR**

Proportion of *Water Act 1912* licences converted to tradeable water access licences under the *Water Management Act 2000*

Definition: This indicator measures the cumulative proportion of licences held under the *Water Act 1912* that have been converted to licences under the *Water Management Act 2000* through the commencement of water sharing plans. The original licences were tied to the land and provided the right to take a specific volume of water, as well as the works to be constructed and operated. The new licences provide a defined share of available water in a particular water source that can be sustainably extracted. This water entitlement is separate from land ownership and can be bought and sold.

Percentage of licences converted to tradeable water access licences



Interpretation: In 2009–10, the percentage of licences held under the *Water Management Act 2000* increased by 6 percentage points to 45%.

Water metering and extraction monitoring

In December 2009, COAG endorsed a National Framework for Non-urban Water Metering, to improve the accuracy of water metering. After 30 June 2010, meters must comply with national standards. The NSW Office of Water has developed a Metering Implementation Plan that describes ways in which NSW will implement the national standards.

A key component of the new standards is the 'pattern approval' of water meters. At 30 June 2010, no meters in Australia had been pattern approved by the National Measurement Institute, and the NSW Office of Water will, as set out in the national framework, ensure that new meters are installed in accordance with the standards.

The NSW Office of Water is installing new water meters under the Hawkesbury–Nepean River Recovery program, funded by the Australian Government. At 30 June 2010, new water meters had been installed on approximately 30% of the extractive capacity in the Hawkesbury–Nepean River. Installation will continue in 2010–11.

In June 2010, the NSW Government submitted a business case to the Australian Government to install or replace water meters in the Murray–Darling Basin at a cost of around $221 million, which will ensure most surface water and groundwater extraction is metered. The Australian Government had already announced the approval of a pilot scheme for this project that will see meters installed in part of the Murray catchment. A decision on the full proposal is expected in 2010–11.

Water compliance monitoring

DECCW, through the NSW Office of Water, is responsible for regulating surface and river water, and groundwater in NSW, which includes monitoring, encouraging and maintaining community compliance. The NSW Office of Water works with other agencies such as the State Water Corporation, the NSW Department of Primary Industries and the Australian Government to gain compliance which ensures all users, including the environment, have an equitable supply of water.

Compliance activities include:

- community and industry education to promote voluntary compliance
- monitoring water resource activities and deploying proactive programs to identify potential breaches in a timely manner
- investigating alleged breaches, and taking appropriate action when a breach occurs.

The NSW Office of Water is using improved investigatory and enforcement powers to help deter would-be offenders and ensure authorised officers are more effective in detecting, investigating and stopping illegal activities.

Information about possible offences is received from surveillance activities and inspections conducted by authorised officers, and reports from the public and other agencies.

Investigations and their associated outcomes under water legislation are shown in tables below.

Compliance investigations in 2009–10 under the *Water Act 1912* and *Water Management Act 2000*

Investigations	
Total number of investigations*	624
Number of investigations finalised (percentage)**	246 (39%)
Number of ongoing investigations***	378

* The total number of investigations is the sum of those commenced during the financial year and those ongoing from previous years.

** When an investigation is finalised, an outcome is determined (compliance action or no compliance action). Refer to the table on the next page for a breakdown of outcomes. An investigation may have more than one outcome.

*** The number of investigations ongoing at the end of the financial year.

■ CASE STUDY

Ensuring equitable access to water along the Darling River

Flooding in early 2010 meant water flowed down the Darling River to the Menindee Lakes and beyond for the first time in 10 years. When the NSW Office of Water received reports of floodwaters being diverted or blocked, a compliance operation was undertaken for the Darling River and its tributaries from Brewarrina to Menindee, as well as tributaries around Broken Hill, to ensure floodwaters were proceeding through the river system.

Aerial surveillance identified 57 structures. Four teams of two compliance officers investigated 42 of the structures to see whether they were impeding, or had the potential to impede, the pending floodwaters. Of the structures inspected, 26 were found to be compliant (within harvestable rights or constructed before 1999) and were not affecting flows. These included a number of road crossings of waterways. Some structures observed from the air could not be located on the ground, while some additional structures were identified. Fifteen structures could not be inspected due to road closures and other access issues.

Photo: M. Smith, DECCW

A water compliance officer checks data in preparation for an aerial surveillance operation.

As a result of the inspections, the NSW Office of Water issued advisory letters, warning letters, and draft directions to remove works and structures or make modifications to comply with licence conditions.

Compliance outcomes in 2009–10

Act	Outcomes of investigations	
Water Act 1912	No compliance action*	47
	Warning/negotiation	40
	Remediation agreement	0
	Remediation notice	7
	License suspension	2
	Stop work order	4
	Prosecution**	0
Water Management Act 2000	No compliance action*	61
	Warning letter	69
	Stop work order	5
	Remediation notice	23
	Penalty notice	40
	Licence suspension	0
	Debit water account	0
	Prosecution**	0

* This figure represents the total number of cases that have an outcome recorded as 'No compliance action', which may include 'Actioned by other agency', 'Advisory letter', 'Authorised', 'Decided not to pursue', 'Exclusion', 'Exempt', 'No works found', and 'Not regulated by Act'. For complex cases there may be more than one 'No compliance action' or 'Multiple compliance actions'.

** Prosecutions finalised in the financial year.

Water savings programs

Cap and Pipe the Bores program

The Great Artesian Basin is one of the largest underground water resources in the world and lies beneath around 25% of NSW and 22% of Australia.

The Cap and Pipe the Bores program, begun in 1999, is a partnership between the NSW and Australian governments and land holders to reduce the waste of water from free flowing artesian bores and bore drains by replacing them with capped bores and efficient piped reticulation systems. Incentives are provided to land holders to offset the cost of rehabilitating bores and installing new infrastructure.

Ongoing benefits of the program include the recovery of artesian pressure, the re-activation of springs, reduced salinity, reduced greenhouse gas emissions, biodiversity conservation, feral animal control and improved land management. Land holders also report that reliable and strategically placed water supplies can significantly reduce the impact of drought.

From 1999 to 2009, $57 million of combined NSW and federal funds were provided to the program. Under a National Partnership Agreement between the NSW and Australian governments as part of the Great Artesian Basin Sustainability Initiative, continued funding has been assured until June 2014.

During 2009–10, 16 schemes were completed, saving 2,046 megalitres of water each year and decommissioning 457 kilometres of bore drains.

Construction is being planned for seven new projects during 2010–11, with a further 16 new projects undergoing early design work. New schemes were ranked according to the ratio of dollars spent to the volume of water saved, ensuring the most cost-effective use of funding.

■ CASE STUDY

New capped bores save water and reduce salinity

The Talmoi/Midkin Bore Project was carried out from April 2008 to June 2010 on the highly productive black soil plains about 50 kilometres north-west of Moree, in predominantly grazing and cropping country.

The NSW and Australian governments provided $1.77 million to replace three 100-year-old free flowing bores with two new capped bores. Land holders provided $2.19 million, bringing the total project cost to $3.96 million. These bores provide essential stock and non-potable domestic water to 25 properties across 38,800 hectares that are powered only by natural, free artesian bore pressure. Around 160 kilometres of bore drains have been deleted, saving 1,200 megalitres of water and stopping 765 tonnes of salinity from entering the environment each year.

Photo: G. Pankhurst, DECCW

Bore after capping and piping.

Darling River Water Savings Project

Through the Darling River Water Savings Project, options are being investigated to improve the water supply and management of the entire Darling River system. Following an initial report in 2007, the NSW and Australian governments each contributed up to $650,000 for further investigations, and the second and final report was delivered in March 2010. This report identifies six broad options for saving water, including structural changes and potential operational changes to reduce loss of water from the Menindee Lakes, as well as infrastructure to maintain the water supply for Broken Hill. Potential annual water savings from these options range from 34 to 125 gigalitres.

The NSW Government will review the final report in light of potential changes that may result from the Murray–Darling Basin Plan and the review of the Murray–Darling Basin agreement. The Australian Government has approved funding of up to $400 million to construct the recommended works.

Environmental works and measures

DECCW's NSW Office of Water administers a number of environmental and river works on behalf of the Murray–Darling Basin Authority, Snowy Hydro Limited and catchment management authorities.These works include:

- the Koondrook Perricoota Forest Flood Enhancement project, which involves constructing a regulator and channel to bring floods to the forest – this is expected to commence in 2010–11
- fishways at the Edward River Offtake and Stevens Weir on the Edward River – these were under construction as at June 2010.

Under the Murray–Darling Basin Authority's River Works and Maintenance Program, $2.7 million is being invested annually until 2011 to rehabilitate the bed and banks of the Murray River by replacing willows with native species, and stabilising the river bank using groynes and sediment management techniques. Similar works are also being undertaken in the upper Murray and Tumut rivers.

Photo: J. Sheehan

Steven's weir fishway under construction, showing the downstream entrance.

Photo: A. Crawford, DECCW

DECCW staff member Jon Holliday analyses algae samples

Water for Rivers Project

The Water for Rivers Project was established in 2003 to implement the recommendations of the Snowy Water Inquiry. The Australian, NSW and Victorian governments committed $375 million over eight years to achieve targeted total water savings of 282 gigalitres.

By June 2010, 215 gigalitres of water entitlements had been recovered to provide environmental flows to the Snowy and Murray rivers. Of this, 136 gigalitres was recovered in NSW, comprising 80 gigalitres from water recovery projects and 56 gigalitres from purchases from willing sellers of entitlements. In 2009–10, projects have been developed in the Murrumbidgee valley. These projects involve measuring water extractions and rivers flows, obtaining more accurate forecasts of tributary inflows, and managing dam releases to better meet customer and environmental needs. A summary of projects and water savings can be found on www.waterforrivers.org.au.

NSW Algal Management Strategy

Blue-green algae can pose major health concerns for people and livestock. The NSW Algal Management Strategy outlines a whole-of-government approach for managing blue–green algal blooms in NSW. The strategy is administered by DECCW's NSW Office of Water, and supported by a State Algal Advisory Group that sets the policy and framework and nine regional algal coordinating committees. These regional committees minimise impacts, provide warnings and advice to the public, and maintain an extensive network of algal monitoring sites throughout NSW.

A map showing the latest algal alerts is provided on www.water.nsw.gov.au/Water-Management/Water-quality/Algal-information/default.aspx.

The continuing drought across most of NSW, followed by summer rainfall that flushed nutrients into waterways, provided ideal conditions for blue-green algal growth in inland reservoirs and rivers during 2009–10. Many large storages maintained red alerts for recreational use for extended periods of the year. These included the Pindari (near Ashford), Copeton (near Inverell) and Windamere (near Mudgee) reservoirs, and Lake Lyell near Lithgow.

In the Murray River, a 2009 bloom was followed by a further major blue-green algal bloom in February 2010, which affected more than 1,000 kilometres of the river from the Hume Dam to Mildura, as well as the Edward River system. Both rivers were placed on red alerts. The bloom was managed effectively under the risk management strategies implemented by the Murray Regional Algal Coordinating Committees, including media releases, web information, algal information hotlines and close monitoring.

The NSW Office of Water evaluated the first Murray River algal bloom, and will release a report on the management of the 2010 bloom that will examine ways in which earlier recommendations have been implemented.

The NSW Office of Water has also commissioned a social profiling study in the Murray region to assess the socioeconomic impact of algal blooms in the region. The report is expected to be finalised during 2010–11, and its outcomes will be used to develop more effective communications and better ascertain the impacts of algal blooms.

A blue-green algal bloom occurred from late February to the end of March 2010 in the lakes in the Olympic Regatta Centre at Penrith. This forced the closure of some recreational activities.

The Algal Management Strategy also includes a framework for managing marine algal blooms. Various marine blooms occurred along the NSW coast during 2009–10 causing the closure of some beaches by local councils, or warnings against recreational collection of shellfish. A bloom of toxic marine algae caused problems during the autumn of 2010 at Wagonga Inlet, near Narooma, causing the closure of commercial oyster harvesting and recreational shellfish gathering.

Monitoring, evaluation and reporting for water resources

DECCW is the lead agency for the 13 natural resource targets in the NSW State Plan. For water resources, targets are set for:

- an improvement in the condition of riverine ecosystems by 2015
- an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses by 2015.

During 2009–10, DECCW's NSW Office of Water coordinated statistical analysis and reporting on these targets as part of the preparation of state of the catchment reports. These reports describe the condition of the 13 catchments across NSW, and for water-related targets include consideration of water quality, fish, macroinvertebrates and hydrology. The reports will be available during 2010–11.

A preliminary statewide map of, and draft identification document for, groundwater dependent ecosystems is being developed. Ecosystem mapping has been produced for several water sharing plans across NSW.

A range of National Water Commission projects continued in 2009–10 to collect groundwater data, and to improve knowledge of groundwater–surface water interactions and the impact of groundwater extraction on aquifer water quality.

A need for improved alignment of water allocation and catchment planning has been identified in the National Water Initiative. In 2009–10, the NSW Office of Water completed a National Water Commission project aimed at better aligning water sharing plans and catchment action plans. A framework was developed that sets out principles that can be applied, with some local variations, in any Australian state or territory, and brings together water and catchment planning using existing resources and data. The approach was trialled successfully in the Hunter–Central Rivers catchment area.

DECCW continued working with the Namoi and Central West catchment management authorities (CMAs) to apply the framework in their areas, using funding from Catchment Action NSW. DECCW has worked with all CMAs to better coordinate and integrate natural resource data and information on river health, provide consistent reporting, and use the most up-to-date data in managing riverine environments.

Water monitoring

The NSW Office of Water holds most NSW information on water resources, with records of river flows and groundwater levels across the state extending back more than 100 years. A comprehensive network of monitoring stations is maintained throughout the state and upgraded as required.

In 2009–10, nine surface water and 196 groundwater monitoring sites were installed to better monitor the state's water resources, and meet the needs of the new water sharing plans. A further 180 'telemetered' sites that allow remote monitoring were installed. The following table shows total operational monitoring sites.

Total operational monitoring sites

	2005–06	2006–07	2007–08	2008–09	2009–10
Surface water – continuous sites*	930	933	949	1,040	1,031
Groundwater – continuous sites	600	650	677	669	723
Grab sample water quality sites	370	427	359	317	309
Groundwater – manual sites	4,575	3,913	3,162	2,958	3,014

* Includes continuous water quality sites

Real-time data collection

The NSW Office of Water operates a telemetry system for receiving and downloading data from over 620 river gauging sites, 200 groundwater sites and 60 metering facilities around NSW. This enables the previous 24 hours' data to be collected from the whole state in about 20 minutes. It also assists in providing data for flood warnings.

Information is collected, processed and automatically sent to key clients, including State Water, the Murray–Darling Basin Authority and the Bureau of Meteorology. It is also available on www.waterinfo.nsw.gov.au, where it is accessed by the State Emergency Service and other agencies, irrigators and the general public.

The surface water telemetry network is undergoing a major upgrade – currently 55% complete – where sites will transmit data hourly directly to the internet, giving water managers and the public the most up-to-date information. The system is meeting or exceeding the target of having 95% of data available on the internet by 9 a.m. daily.

More than 200 groundwater monitoring sites are also providing data for groundwater sharing plans.

Water resource information online

The information from the NSW Government's water website (www.waterinfo.nsw.gov.au) is managed by, and includes data from, a range of state agencies, particularly the Manly Hydraulics Laboratory (operated by the NSW Department of Services, Technology and Administration) and State Water. The website receives over six million visits each year, providing real- and near real-time water data, as well as information from the NSW Office of Water's monitoring programs.

Water quality monitoring

The NSW Office of Water manages and monitors water quality as part of its Surface Water Assessment and Monitoring Program (SWAMP), as well as on behalf of the Dumaresq–Barwon Border Rivers Commission (DBBRC) and the Murray–Darling Basin Authority (MDBA).

During 2009–10, the NSW Office of Water analysed information from 173 monitoring sites (114 under SWAMP, 16 for the DBBRC and 43 for the MDBA). Sites were sampled weekly, fortnightly, monthly or during floods. Chemical, physical and algal measures, including cyanobacteria, were taken and analysed in the NSW Office of Water's laboratory. Annual water quality reports are provided to the DBBRC for its Border Rivers water quality program, and to the MDBA as part of its water quality monitoring, algal investigations and Menindee Lakes operation impact assessments.

Data is used to inform reporting under the NSW Monitoring Evaluation and Reporting Strategy, for monitoring and evaluating NSW water sharing plans and the Basin Water Quality and Salinity Management Plan, for monitoring the effectiveness of catchment investment strategies and for use in State of the Environment reporting.

The NSW Office of Water is developing a method and program for including phycocyanin (blue-green algal pigment) and chlorophyll monitoring in the sampling.

DECCW has received funds from Catchment Action NSW to develop regional water quality management targets, which are required for the National Water Quality Management Strategy. Further development of the regional targets, including whole-of-government engagement, will continue into 2010–11 as part of implementing stage 2 of the project.

Integrated monitoring of environmental flows – regulated rivers

The Integrated Monitoring of Environmental Flows program was established in 1997 to assess the ecological benefits of environmental flow rules in the state's regulated rivers (i.e. rivers where downstream flows are regulated by a major storage or dam to supply irrigation water) as well as the Barwon–Darling River. Benefits of environmental flows include reduced algal blooms, increased biodiversity, more abundant native fish and more natural ecosystems. The program operates in partnership with scientific experts from universities, the CSIRO, cooperative research centres and consultants.

The program monitors and evaluates the ecological performance of water sharing plans for the regulated rivers and informs the development of new plans. It estimates the likely long-term effects of environmental flows and assesses whether the plans' provisions have maximised the ecological benefits of environmental flows.

Studies under the program in 2009–10 included work on:

- links between aquatic invertebrates and biofilms (mats of algae, fungi and bacteria on the stream floor) and how these vary as the result of catchment development
- the responses of fish to flows in the Paterson River
- carbon limitations in the Hunter River estuary
- ecosystem response models and climate change predictions for the lower Lachlan River wetlands
- environmental flow response and socioeconomic monitoring in the Macquarie valley.

For more information, see www.water.nsw.gov.au/Water-Management/Monitoring/Regulated-rivers/default.aspx.

■ CASE STUDY

Stream flow measurements help assess future flood impacts

During floods on the NSW north coast and through the Darling River system in 2009–10, the NSW Office of Water extensively measured stream flows. The use of Doppler technology allowed efficient and instantaneous physical measures to be taken, particularly on the Paroo River which flooded for the first time in nearly 20 years. Such accurate measurements have led to a clearer picture of the distribution of stream flows, and have helped compile improved models for flood prediction and management. Ultimately, more timely and accurate data will support decision making by the Bureau of Meteorology, the State Emergency Service and the community when managing floods.

Cost recovery for water planning and management services

The Independent Pricing and Regulatory Tribunal (IPART) sets maximum prices that can be levied by the NSW Office of Water, on behalf of the Water Administration Ministerial Corporation, on bulk water users for its water planning and management services. These fees and charges provide for progress towards full cost recovery, consistent with national water reforms. By the end of 2010, most services will have achieved or be approaching full cost recovery.

Long-term pricing provides bulk water users with a greater certainty for their business planning. It also assists the NSW Office of Water with establishing planning and management services as a discreet, transparent and accountable core business entity.

During the year, the NSW Office of Water lodged its pricing submission with IPART for the period commencing 1 July 2010. The submission proposed fees and charges for services at full cost recovery levels from 2010–13. IPART sought further costing and pricing information, resulting in deferment of commencement of the new determination. In the interim period, fees and charges remain at the level set for 2009–10.

A key focus for planning and management cost recovery is the pricing commitments under the national water reforms. These include meeting requirements under the *Water Act 2007* (Commonwealth), including publishing information on services and associated charges and reporting to the Australian Competition and Consumer Commission.

In December 2009, the NSW Government announced that fixed water charges would be waived for general security regulated licence holders that receive a zero water allocation for three consecutive years. For 2009–10, this waiver applied to general security licence holders in the Lachlan valley.

Groundwater drilling

The NSW Office of Water provides specialist services to government agencies and communities for water well drilling, particularly very deep bores. Significant projects this year included:

- drilling six new artesian bores and sealing eight old bores as part of the Cap and Pipe the Bores program
- constructing two deep production bores in the Koondrook Perricoota forest to provide water for the Living Murray project
- monitoring bores in the Macleay Valley sands for groundwater, and monitoring the interaction between groundwater and sea water levels
- monitoring additional bores to assess the connections between surface water and groundwater in the Murray and Murrumbidgee valleys
- establishing a test production bore and monitoring bores for the University of NSW groundwater field training centre at Wellington
- rehabilitating two town water bores near Kempsey.

Photo: G. Russell

Airlifting groundwater to clean a hole following a change of rods during bore drilling.

Photo: DECCW

Ensuring urban water and sewerage services are well managed, efficient and equitable

Metropolitan Water Services

Metropolitan Water Plan

The NSW Office of Water manages the development, implementation and review of the Metropolitan Water Plan, which sets out ways in which the NSW Government is securing Sydney's water supplies while improving river health.

The plan outlines measures that ensure Sydney's water needs are met in response to drought, a changing climate and a growing population. It is reviewed and updated every four years to reflect changes in community behaviour, improved understanding of climate change impacts and advances in technology. Sydney's water is being secured through:

- dams, which continue to provide most of Sydney's drinking water
- recycling – projects in place and being planned will mean recycling provides 12% of Sydney's water needs by 2015, which is equivalent to 70 billion litres of water being recycled every year
- desalination – the plant began operating in the summer of 2010 and can provide up to 15% of Sydney's current water needs
- water efficiency – measures will save 145 billion litres of water a year and reduce Sydney's water needs by 24% by 2015.

The NSW Office of Water coordinates the actions under the plan, chairs the Metropolitan Water Chief Executive Officers' Committee and provides secretariat support to the Metropolitan Water Independent Review Panel. The panel provides expert advice to the Premier and monitors progress of the Metropolitan Water Plan, including input to the four-yearly reviews.

Metropolitan Water Plan – review

A major review of the 2006 Metropolitan Water Plan was completed in 2009–10. The review included an analysis of environmental, social and economic factors to ensure the plan can provide water for people and the environment in the medium term.

Following workshops and surveys in early 2009, a second phase of consultation was undertaken in late 2009 involving comprehensive community discussion of the proposed measures.

The NSW Office of Water modelled available water supply and demand options, including an analysis of cost effectiveness and an analysis of different rainfall and inflow scenarios such as a drought more than twice as severe as the recent drought. The review also included an assessment of the environmental and social impacts of the measures by expert panels.

The review confirmed that sound investments have been made in water supply and efficiency programs over the past four years. It found that only minor adjustments to the directions of the 2006 plan are needed to ensure Sydney has enough water to meet its needs until at least 2025, and to help protect river health through environmental flows. The updated plan is expected to be released in the second half of 2010.

Metropolitan Water Plan – progress

A progress report on the 2006 Metropolitan Water Plan, which will be incorporated into the 2010 plan, has determined that the NSW Government is on track to secure Sydney's water supplies. In 2009–10:

- more than 100 billion litres of water per year were saved through water efficiency programs
- 33 billion litres of water per year were being recycled that might otherwise have come from drinking water supplies (this amount will rise by a further 18 billion litres a year when the Replacement Flows Project is initiated later in 2010 (see case study on the next page)
- the desalination plant was completed on time and $89 million under budget
- 90 of 92 actions under the Metropolitan Water Plan had either been achieved or were on target; only two had been delayed, both of which are progressing to a revised timetable.

The NSW Office of Water is responsible for, and has worked with other agencies to deliver, initiatives related to:

- increasing and diversifying water supplies
- increasing recycling and stormwater re-use
- understanding the impacts of climate change on water demand and supply
- protecting and restoring river health
- implementing water industry competition reform
- contributing financial and in-kind support to the review and extension of the federal Water Efficiency Labelling and Standards (WELS) scheme
- managing and delivering the Water for Life education program.

Each of these initiatives is reported in more detail below.

Increasing and diversifying water supplies

The NSW Office of Water continues to work with key agencies such as Sydney Water and the Sydney Catchment Authority (SCA) to implement key projects under the Metropolitan Water Plan. The SCA has completed extensive investigations and concept designs for the rehabilitation or replacement of the Upper Canal which transports water from the Upper Nepean dams to Prospect Water Filtration Plant.

Construction work has also been completed on Sydney's desalination plant which will be able to provide up to 15% of Sydney's water needs. The power used by the plant is being 100% offset with renewable energy from a 67-turbine wind farm near Bungendore.

Increasing recycling and stormwater re-use

DECCW, through the NSW Office of Water, manages water recycling proposals where the private sector is the proponent. In fulfilling this role, DECCW liaises with Sydney Water, other key NSW Government agencies, and private sector proponents to provide technical and commercial advice.

Significant projects under way include the Rosehill–Camellia Recycled Water Scheme, which will be operational in 2011 and supply 4.7 billion litres of water each year, and the Caltex and Continental Carbon project at Kurnell which is expected to be completed by 2012.

Stormwater management helps protect people and property from flooding, improves waterway health and, if stormwater is treated and reused, provides a valuable alternative source for non-drinking purposes. The NSW Government is promoting and supporting an integrated approach to stormwater harvesting, focusing on smaller, local schemes which provide an alternative water source but also deliver river health, water quality and flood mitigation benefits.

During 2009–10, the NSW Office of Water carried out a feasibility study into the Prospect Roofwater Harvesting Scheme in western Sydney. The outcomes of the study, due in 2010–11, will determine if the project will proceed to a detailed design stage.

Information on the 100 or more recycling and stormwater projects that are under way or planned across Sydney is available on www.waterforlife.nsw.gov.au/recycling.

Understanding the impacts of climate change on water demand and supply

To better understand the impacts of climate change on Sydney's water supply system and future water demand, the NSW Office of Water has coordinated a collaborative study with the CSIRO, the University of New South Wales, Sydney Water, the Sydney Catchment Authority and the federal Department of Climate Change. The project, titled 'The climate change impacts on water supply and demand in Sydney', began in mid-2006 and the final report is due for release later in 2010.

■ CASE STUDY

Hawkesbury–Nepean River to be replenished with 18 billion litres of recycled water

The Replacement Flows Project involves constructing the St Marys Water Recycling Plant in western Sydney, which was completed in early 2010. The plant is treating effluent from the St Marys, Quakers Hill and Penrith sewage treatment plants to an advanced level, and then discharging it to Boundary Creek, downstream of Warragamba Dam. The water flows into the Hawkesbury–Nepean River from Boundary Creek.

These discharges will substantially replace environmental releases from Warragamba Dam that currently help protect the river downstream, thereby saving water in the dam for drinking while also significantly reducing nutrient loads to the river. Ultimately, 18 billion litres of highly treated recycled water each year will flow into the Hawkesbury–Nepean River.

Photo: G. Duffus, courtesy Sydney Water Corporation

Water from the recycled water plant at St Marys is piped to Penrith, where it is released into Boundary Creek before entering the Hawkesbury–Nepean River.

DECCW issued an environment protection licence to Sydney Water in February 2010 to regulate any impacts from the recycled water discharged to Boundary Creek.

The project broke new ground in modelling climate change impacts at the regional level and has helped to identify future research needed to improve modelling. While the results of the study provide valuable information on ways in which Sydney's water supply and demand may be affected by climate change over time, climate change modelling is an evolving science and there are remaining uncertainties and limitations in downscaling global models to the regional level and predicting greenhouse gas concentrations in the future.

Protecting and restoring river health

The NSW Office of Water continues to lead the development of water sharing plans for the river and groundwater systems of the Greater Metropolitan Region in accordance with the *Water Management Act 2000*. Significant work has progressed on the draft surface water and groundwater sharing plans for Sydney. Public consultation on the draft plans took place in mid-2010. Once commenced, these plans will provide legal protection for environmental water and thereby contribute to improving river health.

The review of the 2006 Metropolitan Water Plan and preparation of an updated plan has helped balance environmental needs and the needs of the Sydney community regarding water supply. In line with the plan, the Sydney Catchment Authority (SCA) has modified its dams and weirs. New variable environmental flows began being released from Tallowa Dam on the Shoalhaven River in mid-2009 and from the four dams on the Upper Nepean river system from mid-2010. Work is also nearly complete on a series of weirs downstream on the Nepean River to allow passage of flows and fish movement.

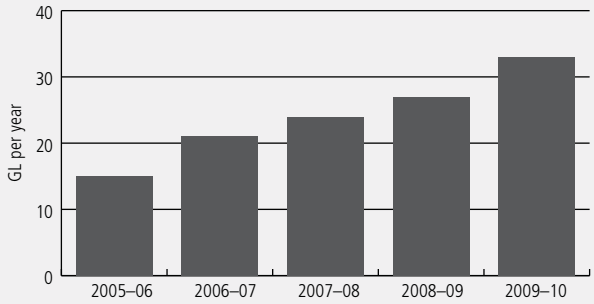
Importantly, the 2010 Metropolitan Water Plan sets out the further work needed to identify optimal environmental flow rules for Warragamba Dam. These will be outlined in the 2014 update to the plan.

■ PERFORMANCE INDICATOR

Volume of water recycled in Sydney

Definition: This indicator reports the volume of water recycled in Sydney each year. Both the State Plan and the Metropolitan Water Plan set a target to increase water recycling in the Sydney metropolitan area from 15 billion litres in 2005 to 70 billion litres by 2015. Under the 2010 Metropolitan Water Plan, water recycling will provide 12% of Sydney's water needs by 2015. The recycled water will be used for non-drinking purposes such as industrial uses, watering parks and sporting fields, toilet flushing and garden watering.

Volume of water recycled in Sydney



Interpretation: In 2009–10, the volume of water recycled in Sydney increased by a further six billion litres. The NSW Office of Water has worked with Sydney Water and key organisations to increase the volume of recycled water from 15 billion litres in 2005–06 to 33 billion litres in 2009–10. With the commissioning of the Replacement Flows Project, which could supply up to 18 billion litres of highly treated recycled water each year to the Hawkesbury-Nepean River from late 2010, this figure will increase further.

The NSW Office of Water developed and released catchment health indicators for the Sydney Drinking Water Catchment. These indicators cover land use and human settlements, biodiversity and habitats, water availability and water quality. One indicator relates to community attitudes

■ CASE STUDY

Environmental monitoring of Sydney's desalination plant

DECCW has been heavily involved in the environmental regulation of two key components of the Sydney Desalination Project: the desalination plant itself, including intake and outlet structures, and the pipeline that transfers water underneath Botany Bay to the drinking water system at Erskineville.

DECCW assessed the impact of the plant on the environment during its construction and operational phases, focusing on disposal of wastes generated during the plant's operation, minimising the toxicity of brine discharged to the ocean, minimising impacts of the intake structure on marine life, and monitoring the marine environment.

Now that the plant is operational, DECCW regulates the discharge into the Tasman Sea of brine from the desalination process through an environment protection licence held by the plant operator. Modelling of the brine discharge was undertaken as part of the design process, and is required to be validated by the operators of the plant in the coming year. Sydney Water is monitoring the brine discharge to detect and measure any environmental impacts.

Photo: B. Peters, courtesy Sydney Water Corporation

The desalination plant at Kurnell.

DECCW has worked closely with Sydney Water, its contractors and the NSW Department of Planning throughout the project to minimise any environmental and amenity impacts.

and engagement, which supplements the biophysical indicators. These indicators will be used in future audits to assess environmental changes across the catchment.

The NSW Government has established the Office of the Hawkesbury–Nepean to improve the health of the Hawkesbury–Nepean River system. The *Hawkesbury–Nepean River Act 2009* commenced in February 2010 and established the office as a statutory corporation and a NSW Government agency. The office will:

- coordinate and implement management strategies on the health of the Hawkesbury–Nepean river system, particularly regarding the management of aquatic weeds
- give the public access to information and advice about management strategies relating to the health of the Hawkesbury–Nepean river system
- provide opportunities for the public to be involved in the development of management strategies
- promote the effective management of in-stream development, such as jetties and other waterfront structures
- provide a one-stop shop for government services relating to the river.

In May 2009, the Australian Government announced up to $77.4 million of funding for the Hawkesbury–Nepean River Recovery Program. Comprising seven projects, the program aims to improve river health by securing more than seven billion litres of water each year for additional environmental flows, increasing Sydney's water supply and stopping over 48 tonnes of nutrient pollution from entering the river each year. DECCW is carrying out three of the projects:

- the Licence Purchase Project which will purchase water access licences from willing sellers across the catchment
- the Improving Hawkesbury–Nepean Water Balance Accounting Project, which aims to install or upgrade water metering systems for up to 2,000 licensed water users
- the Nutrient Export Monitoring Project, which aims to measure nutrient from primary industries before and after the Nutrient Smart Management and Water Smart Farms projects.

The seven projects are planned for completion in September 2011. For further information visit www.ohn.nsw.gov.au/River-recovery/default.aspx.

Photo: R. Coventry, DECCW

Harvesting water hyacinth weed at Castlereagh.

The Lower Hawkesbury–Nepean Nutrient Management Strategy released in 2010 coordinates and targets the range of projects and programs under way to reduce the amount and types of nutrients entering the river.

Implementing water industry competition reform

Under the *Water Industry Competition Act 2006*, the NSW Government has licensed four private companies to provide recycling and wastewater services. The projects are being overseen by DECCW, through the NSW Office of Water.

The first licence was issued to construct, maintain and operate a new recycled water plant at Fairfield as part of the Rosehill Recycling Scheme. This will initially provide 4.7 billion litres of recycled water a year to industrial and irrigation customers in western Sydney. The second licence was issued to allow high-quality recycled water to be conveyed to users through a network of retrofitted gas pipes. Further licences have been issued to a company to operate a recycled water treatment plant in the heart of the Sydney CBD, which will supply recycled water for indoor non-drinking purposes. Another company has been granted licences to recover water from sewage in a major development at Darling Harbour to provide recycled water for non-drinking purposes.

The 2010 Metropolitan Water Plan continues to encourage the private sector to develop new technologies and enter the industry. Under the plan, work is in progress to streamline the approval processes between the *Water Industry Competition Act 2006* and the *Local Government Act 1993* for private schemes.

Managing and delivering the Water for Life education program

Community involvement continues to be an important element of the Metropolitan Water Plan. Water for Life, which is managed by the NSW Office of Water, is a comprehensive six-year education program to engage the 4.3 million people in the greater Sydney region to help secure water for the future. The program aims to:

- increase community understanding of the strategies to secure Sydney's water
- encourage households, businesses and government across Sydney to save water.

Public information projects under Water for Life in 2009–10 included:

- the Water for Life communications campaign, run on television and radio, in print and online, which has increased the proportion of community members 'taking action often' to reduce their water consumption to 84% (from 65% in 2005)
- the Water for Life website, electronic newsletter and microsite, which are useful community resources attracting an average of over 23,000 page views each month
- community input into the review of the 2006 Metropolitan Water Plan that included workshops for community, business and key stakeholders across greater Sydney, and a publicly available online survey

Photo: I. Charlton, DECCW

Col Maes checks an installed meter on the Nepean River for the Improving Hawkesbury-Nepean Water Balance Accounting Project.

- an online stormwater video series and stormwater and recycling maps which increase community understanding of the many recycling and re-use projects that are planned or under way across Sydney.

The Water for Life education program coordinates activity across the water agencies and non-government organisations, and implements the actions of the *Water Education Plan for Greater Sydney 2008–2012*. The program is supported by the inter-agency Metropolitan Water Education Group comprising communication and education professionals from DECCW, Sydney Water, the Sydney Catchment Authority and the Office of the Hawkesbury–Nepean.

Projects in 2009–10 focused on supporting other organisations to deliver water education, including:

- training workshops on communication and behavioural change to support staff from councils and non-government organisations in delivering best-practice water education projects
- developing a Stormwater Partnership Kit through a pilot project that allocated grant funding and provided educational resources for councils across greater Sydney.

Targeted education projects to engage the community in 2009–10 included:

- eight councils and non-government organisations receiving grant funding of almost $300,000 to deliver practical water education projects
- the WaterSmart Sydney pilot, which coached householders over the phone in developing personalised action plans to save water, energy and money in their homes. A component of this pilot project supported culturally and linguistically diverse communities to continue their water wise activities.

Supporting water customers

The NSW Office of Water coordinates and administers the Government's water concession programs. These include pensioner water rebates schemes and water rates exemptions for councils, and charitable and not-for-profit organisations. As part of this program, the Government provides funds to water corporations for rebates and exemptions on water bills to ensure that vulnerable customers have continued access to urban water services.

During 2009–10, over $132 million was distributed under these concession programs, including nearly $110 million by Sydney Water and nearly $10 million by Hunter Water Corporation in pensioner water rebates.

The NSW Office of Water began a review of pensioner water rebates in NSW. The review is examining the four different pensioner rebate schemes operating in NSW, and will make recommendations in 2010–11.

Non-Metropolitan Water Services

Country Towns Water Supply and Sewerage Program

The Country Towns Water Supply and Sewerage Program supports the provision of effective, sustainable and safe water supply and sewerage services by more than 100 non-metropolitan local water utilities in NSW.

DECCW, through the NSW Office of Water, develops strategic policy and provides leadership, guidance and technical expertise to support water supply and sewerage services in non-metropolitan urban areas of NSW. Key services include:

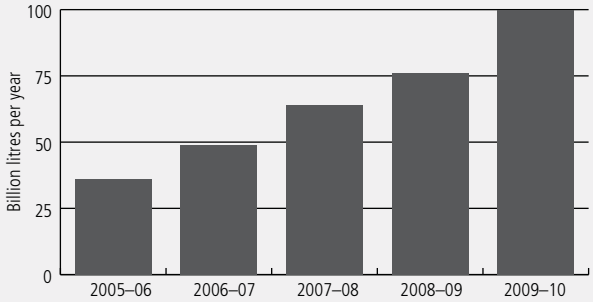
- providing technical assistance in best practice management, operation and maintenance to 106 non-metropolitan utilities
- overseeing and monitoring utility performance
- managing local water and sewage treatment activities, and dam safety programs, to ensure the safe and effective management of the 550 water and sewage treatment works and 116 dams and weirs

■ **PERFORMANCE INDICATOR**

Volume of water saved in Sydney

Definition: This indicator measures the volume of water saved in Sydney each year compared to consumption in 1999 through efficiency measures implemented as part of residential and business programs, leak reduction and regulatory measures. Efficiency measures introduced under the Metropolitan Water Plan are reducing the demand for water, with a target to save 145 billion litres per year and reduce Sydney's water needs by 24% by 2015.

Volume of water saved in Sydney



Interpretation: The volume of water saved compared to consumption through water efficiency programs increased to more than 100 billion litres per year in 2009–10. The NSW Office of Water, with other agencies, undertook a number of activities under the Water for Life education program to inform Sydneysiders about the value of water and the role of the Metropolitan Water Plan. This work, in conjunction with other demand management programs under the Metropolitan Water Plan such as BASIX building sustainability guidelines, the Water Efficiency Labelling and Standards (WELS) scheme and Sydney Water's residential *WaterFix* and *Every Drops Counts* in Business programs, have helped to reduce water use to levels equivalent to the early 1970s, despite an increase in population of around 1.4 million.

- administering funding for backlog water and sewerage infrastructure and emergency drought assistance.

Strategic business and financial planning

To assist delivery of an effective and efficient water supply and sewerage services in non-metropolitan NSW, the 106 local water utilities must prepare and implement sound strategic business plans to demonstrate their financial sustainability. These include a 30-year asset management plan to address future infrastructure needs. Through these plans, utilities can fund all future commitments for capital and recurrent expenditure, and dividend and tax-equivalent payments.

In the most recent monitoring report for 2008–09 (see the *NSW water supply and sewerage performance monitoring report* on www.water.nsw.gov.au) 89% of local water utilities had completed a sound strategic business plan and long-term financial plan, compared to only 31% ten years earlier. This includes all utilities with over 3,000 connected properties and covers 98% of the connected properties in non-metropolitan NSW.

Best-practice pricing

Responsible and equitable pricing of water supply, sewerage and liquid trade waste services is a key responsibility of each utility. Such pricing enables customers to balance the benefits and costs of their use of water services, and promotes efficient use of water resources.

Better pricing has enabled NSW local water utilities to avoid more than $1 billion in water and sewerage capital expenditure over the past decade, while also avoiding the need to increase overall costs to consumers, as measured by the median 'typical residential bill'.

Trade waste regulation

One hundred local water utilities in NSW are responsible for regulating liquid trade waste discharges to their sewerage systems. Responsibilities include approving and monitoring discharges and levying appropriate fees and charges. To assist utilities, the NSW Office of Water released *Liquid trade waste regulation guidelines* in 2009 (see www.water.nsw.gov.au/Urban-water/Country-towns-

■ CASE STUDY

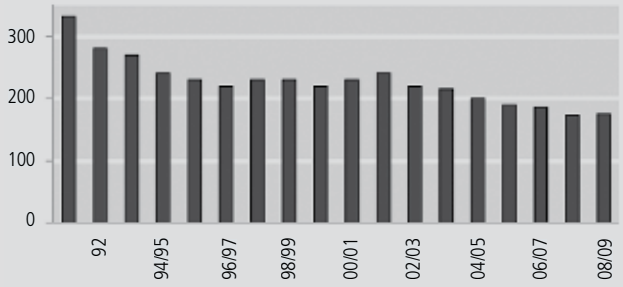
Strategic pricing saves water

Over the past 14 years to June 2010, the median residential water usage charge has increased from effectively nil (i.e. a 'free water allowance') to 150 cents per kilolitre. Although 68% of local water utilities had effectively 'free' water allowances in 1996–97, these were abolished by 2006–07. Over a similar period, the proportion of water utilities' revenue from residential customers that comprises water usage charges increased from 20% to 73%.

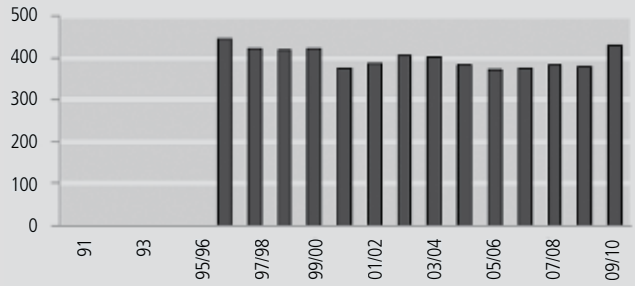
This has sent strong pricing signals to residential water users that have assisted NSW utilities to achieve a 47% reduction in the average volume of water supplied to residential properties since 1991, which equates to a saving of 110 billion litres per annum.

At the same time, there has been a reduction in the statewide median water supply 'typical residential bill', which has fallen by 3% over the past 14 years.

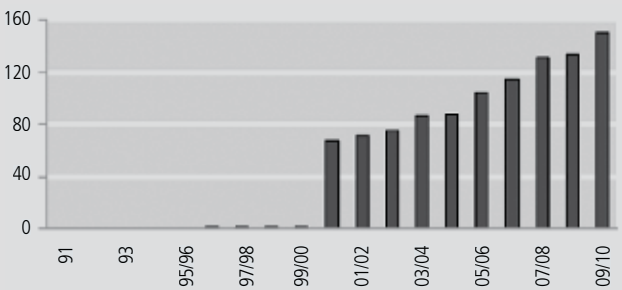
Average annual residential water supplied (kL/connected property)



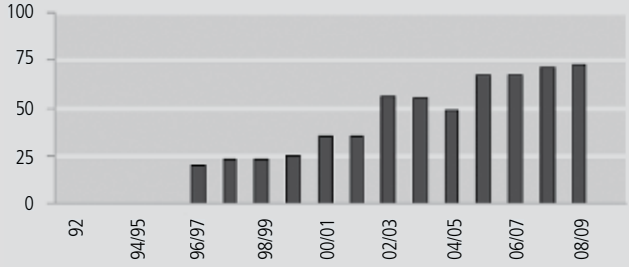
Water supply typical residential bill 2009–10 $



Residential water usage charge (c/kL) 2009–10 $



Percentage of residential revenue from water usage charges



program/Best-practice-management/Liquid-trade-waste/Liquid-trade-waste/default.aspx).

To comply with the best practice guidelines, local water utilities must adopt and implement an appropriate liquid trade waste policy. To assist them, the NSW Office of Water has provided a model policy, reviews utilities' policies and provides consent to soundly based policies. As at 30 June 2009 (the latest date for which figures are available), 69% of utilities had an appropriate trade waste policy, 67% had complying liquid trade waste fees and charges, and 69% had complying non-residential sewerage charges.

Utility performance

The 2008–09 annual *NSW water supply and sewerage performance monitoring report*, which is available on www.water.nsw.gov.au (the most recent available) presents key performance indicators for all utilities, together with the statewide performance of the combined non-metropolitan water utilities and interstate comparisons. The report has been provided to various government agencies and the Independent Pricing and Regulatory Tribunal.

Summary performance reports are provided by the NSW Office of Water for each utility, showing its performance and its ranking relative to other utilities for over 50 key performance indicators.

National performance framework

The NSW Office of Water is a member of the group that developed and maintains the National Performance Framework for annually reporting the performance of the larger urban water utilities (those with more than 10,000 connected properties) under the National Water Initiative.

Under this criteria, 30 NSW utilities are eligible for reporting in the *National performance report 2008–2009 for urban water utilities*. This report shows:

- of the eight Australian states and territories, NSW is one of the three that have complied with the economic regulation and pricing requirements of the National Water Initiative
- while real water and sewerage prices have been increasing in recent years to fund increases in operating and capital expenditure, in non-metropolitan NSW the typical residential bill for water supply and sewerage services has fallen slightly over the past 13 years.

Overall, non-metropolitan water utilities in NSW have implemented continuous improvement principles, including preparing an annual action plan for improving their performance. They have also successfully avoided real increases in their 'typical residential bill' measure through sound strategic business planning and asset management, together with their strong pricing strategies that have achieved full cost recovery and efficient use of water supply, and sewerage and trade waste services.

Water conservation and drought management

By 2008–09 (the latest year for which figures are available), 87% of local water utilities had implemented water conservation plans that included pricing reforms, community education, water loss reduction, retrofit programs and rebates for water efficient appliances or rainwater tanks.

In terms of recycling, 79% of local water utilities had begun programs to re-use effluent, mostly for agriculture. The total volume of water recycled in the 2008–09 financial year was 38,000 megalitres. This was 23% of the total volume of sewage collected, compared to 14% in 1998–99. In 2008–09, 25% of local water utilities recycled over 50% of their effluent. Nine utilities each recycled over 1,000 megalitres.

By 2008–09, 90% of local water utilities had implemented a drought management plan. NSW is currently in its ninth year of continuous drought. During periods of drought, the Government provides technical and financial assistance to utilities to maintain essential water supplies. To ensure urban

■ **PERFORMANCE INDICATOR**

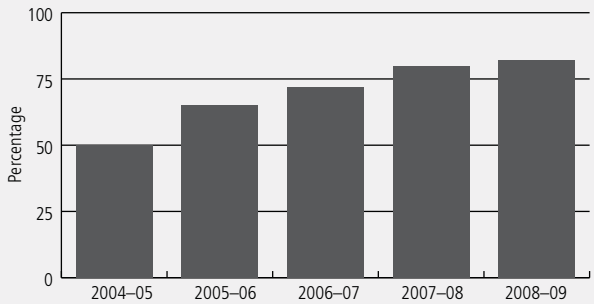
Percentage of requirements of best practice management guidelines met by local water utilities

Definition: This indicator measures the cumulative proportion of the 19 key requirements of the *Best practice management of water supply and sewerage guidelines 2007* (or earlier versions of the guidelines) that are being met by the 106 NSW local water utilities. Compliance with the guidelines enables utilities to achieve effective, sustainable and safe water supply and sewerage services. The guidelines focus on business and financial planning, pricing and regulation, water conservation, drought management and integrated water cycle management.

Each utility that meets all the requirements of the guidelines is eligible to pay an 'efficiency dividend' to the council's general revenue (required under the National Water Initiative), and compliance is also a prerequisite for eligibility for financial assistance towards capital cost of backlog infrastructure under the Country Towns Water Supply and Sewerage Program.

Detailed information is provided in the annual *NSW water supply and sewerage performanc*e report, which is available on the NSW Office of Water website (www.water.nsw.gov.au). Data collection and compilation timeframes mean that the report is not available for some 12 months after the end of the financial year reported, hence the latest available figures are for 2008–09.

Proportion of key requirements of best practice guidelines met by local water utilities



Interpretation: In 2008–09, 82% of the guideline requirements were met, an increase of 2% since 2007–08. Data for 2009–10 will be available in the next annual report.

water supplies are reliable and secure, the NSW Office of Water works to ensure that no town runs out of water.

In 2009–10, financial assistance of $37 million was approved by the NSW Government to secure town water supplies, bringing the total since the drought commenced to $92 million.

Integrated water cycle management

Integrated water cycle management is the integration of urban water supply, sewerage and stormwater services on a local catchment basis. This requires that water services be managed sustainably, considering natural processes, other water users (including the environment), and broader catchment issues. It also requires that water use be efficient and waste be reduced to a minimum. Through such management, a local water utility can identify an optimal strategy that would include opportunities for water recycling, stormwater harvesting, water-sensitive urban design, reduction in system leakage and the use of sources such as rainwater tanks.

Twenty-eight of the 106 local water utilities in NSW have now completed a full integrated water cycle management plan and a further 23 utilities have begun preparing their plan. These plans ensure not only improved water sustainability, but also often provide better social, environmental and economic outcomes.

Infrastructure funding

The Country Towns Water Supply and Sewerage Program provides financial support to local water utilities to provide water supply and sewerage services to country towns in NSW. Assistance is provided for the capital cost of works to address the 'backlog' in water supply and sewerage infrastructure. The identified 'backlog' relates to the infrastructure necessary to meet the demand, loads, service standards and regulator requirements that existed when the 1996 program was first launched by the NSW Government. Each utility is responsible for other costs, including operating and maintenance costs and any capital costs required to meet growth, asset replacement and changes in standards or requirements post-1996.

During 2009–10, the program provided $64.9 million. This funding enabled the completion of major sewerage projects at Coffs Harbour, Crowdy Head, Cudal, Currarong, Mooney Mooney-Cheero Point, Stroud and Tenterfield. Major water supply projects were completed for the Shannon Creek dam, Mendooran and Urbenville, and Woodenbong Muli Muli, as well as for emergency drought relief projects across the state.

The total expenditure on the program since 1996 exceeds $875 million, and has enabled completion of 385 water supply and sewerage projects that have delivered enhanced public health, environment and security of services, directly benefiting more than one million residents in country NSW.

The Government's total commitment to this program is now more than $1.17 billion, and the program is scheduled to run until 2016–17. This assistance is ensuring that water supply and sewerage services in urban areas of regional NSW remain appropriate, affordable, cost-effective and well managed, meet community needs, protect public health and achieve sustainable environmental outcomes.

Population in non-metropolitan NSW with reticulated water supply service in 2008–09	**1.8 million (97.9% coverage).**
Population in non-metropolitan NSW with reticulated sewerage service in 2008–09	**1.7 million (95.2% coverage).**

Aboriginal Communities Water and Sewerage Program

Access to clean drinking water and the ability to safely dispose of waste water are critical to improving the health of Aboriginal communities. The NSW Aboriginal Land Council and the NSW Government are working in partnership to improve water and sewerage services for Aboriginal communities across NSW. More than $200 million will be invested over 25 years on maintenance, operation, monitoring and capital works for water and sewerage infrastructure.

The program commenced in July 2008. The NSW Office of Water manages the program, with implementation overseen by a steering committee comprising representatives from key agencies and organisations.

Risk-based management plans are being developed to identify risks to the continued safe operation of the water supply and sewerage systems, to improve the reliability of the systems. Five management plans have been completed so far, and a further 10 interim plans have been prepared.

The NSW Office of Water consults with local Aboriginal land councils and local water utilities to develop agreements through which the utilities, or other service providers, take responsibility for day-to-day operation and maintenance of water and sewerage systems. Two long-term agreements have been executed so far, and 21 interim agreements are in place.

As a result of the program, more than 2,700 Aboriginal people are now receiving a better water supply or sewerage service, or both of these.

Photo: J. Bourke

The treated and raw water storage tanks at the Murrin Bridge Aboriginal community in the Cobar Shire, located 15 km north of Condobolin, which will be maintained and funded by the Aboriginal Communities Water and Sewerage Program over the next 25 years.