Central Coast Water Supply System

Central Coast Council

Contents

Mardi Dam inlet

Dam	Catchment Area (km^2)	Maximum Capacity (million litres)	Fun fact: Equivalent to how many Olympic size pools
Mangrove Creek Dam	101	190,000	76,000
Mardi Dam	4	7,400	2960
Mooney Mooney Dam	39	4,600	1840

The Central Coast has the third largest urban water supply system in New South Wales.

The water supply system serves the region's population of more than 342,000 people, delivering water to more than 135,000 homes and businesses.

The system incorporates three dams, three weirs, three water treatment plants, over 50 reservoirs, and more than 2,000 kilometres of pipelines.

The region's drinking water is drawn from Mangrove Creek and Mooney Mooney Creek, in Gosford, and Ourimbah Creek and Wyong River, in Wyong. When there is not enough flow in the creeks and rivers to meet demand, for example during drought, water can be released from Mangrove Creek Dam.

The Mardi-Mangrove Link pipeline helps boost storage levels at Mangrove Creek Dam as it transfers excess water from Wyong River to the dam for storage.

Water can be transported into the system by the Hunter Connection. This two-way pipeline provides additional water during drought or for operational reasons for both the Central Coast and the Hunter regions.

The water supply is also supplemented by groundwater borefields at Woy Woy and other minor groundwater sources. Other new sources of water include stormwater harvesting and recycled water.

Mangrove Creek

Management of the water supply system

The water supply on the Central Coast is managed in three parts:

Long term planning and water strategy – is the responsibility of the Central Coast Council.

Operation and maintenance of headworks – Council operates and maintains the dams, weirs and treatment plants.

Local water infrastructure and delivery– Council manages the day to day delivery of water and sewerage services in the local government area.

Mooney Mooney Dam


Lake Macquarie City
Hunter Connection
Mangrove Creek Dam
Boomerang Creek Tunnel
Gwandalan Sewage Treatment Plant Recycled Water Plant
Mannering Park Sewage Treatment Plant Recycled Water Plant
Charmhaven Sewage Treatment Plant Recycled Water Plant
Warnervale
Mardi–Mangrove Link
Kanwal Reservoir
Lower Wyong River Weir
Toukley Recycled Water Plant Sewage Treatment Plant
Mardi Water Treatment Plant
Mardi Dam
Mardi Groundwater Bore
South Wyong Sewage Treatment Plant Recycled Water Plant
Ourimbah Creek Weir
Tuggerah Reservoir
Mangrove Creek Weir
Mangrove Creek Groundwater Bores
Ourimbah Groundwater Bore Fields
Mangrove Creek Pipeline
Mooney Mooney Dam
Bateau Bay Sewage Treatment Plant Recycled Water Plant
Narara Groundwater Bores
Western Connection
Somersby Groundwater Bore
Coastal Connection
Kariong Reservoir
Somersby Water Treatment Plant
Kincumber Sewage Treatment Plant Recycled Water Plant
Woy Woy Sewage Treatment Plant Recycled Water Plant
Woy Woy Groundwater Bore Fields
Woy Woy Water Treatment Plant
Hornsby Shire
Dam
Water Treatment Plant
Tunnel
Sewage Treatment Plant
Into the water supply system
Weir
Reservoir
Pipeline
Recycled Water Plant
Groundwater Bore
Mangrove Dam Catchment
Wyong River Catchment
Mardi Dam Catchment
Mangrove Weir Catchment
Mooney Dam Catchment
Ourimbah Creek Catchment
Porters Creek Catchment
Mardi – Warnervale Pipeline

History of the water supply system

1929 – 1930: The first centralised water supply system was implemented in Wyong. A concrete-lined reservoir was constructed on Chapman Hill and water was pumped to it from Wyong River for distribution to residents.

1938: Gosford was connected to a new water supply direct from a dam on the lower reaches of Mooney Mooney Creek.

1950's: Water was piped to the northern areas of the Wyong Shire.

Early 1960's: The first stage of the Entrance Water Supply Scheme commenced. Officially opened in 1965, the expanded scheme eventually provided reticulated water throughout much of the Wyong Shire.

1961: As development and population increased, Mooney Mooney Dam was built to replace the Lower Mooney Mooney Dam.

1962: Mardi Dam and Wyong River Weir were built.

Late 1960's - 1970: The State Government identified the Central Coast Region for urban development. The NSW Public Works Department began investigating and planning expansion of the water supply systems. A common system serving both Gosford and Wyong local government areas was identified as the most reliable and economic solution.

1971: As dependence on the water supply system increased, it became more important that the raw water be treated to guarantee standards of public health. Subsequently Somersby Water Treatment Plant was constructed, the first stage in 1971 and a second stage in 1989.

1975: Lower Mangrove Creek Weir was built.

1977: Gosford City and Wyong Shire Councils entered into an agreement to build, operate, maintain and share the cost of the water supply headworks scheme.

The Councils and NSW Public Works established the Gosford/Wyong Joint Water Supply Committee as a forum to manage the jointly owned works.

1979 – 1982: Mangrove Creek Dam was built to meet the water needs of an expanding population.

Mangrove Creek Dam construction quarry

Construction of Mangrove Creek Dam wall

Mangrove Creek Dam wall prior to concrete

1984: The first stage of the Mardi Water Treatment Plant was opened for use in 1984 with subsequent augmentation in 1992 to increase the capacity of the plant.

1987: Both Councils were gazetted as Water Supply Authorities by the NSW Government under the Water Supply Authorities Act 1987. The provisions of the Water Supply Authorities Act were incorporated into the Water Management Act 2000.

1989: Boomerang Creek Tunnel was completed. This tunnel enabled water to be transferred from Mangrove Creek Dam to Wyong River, for extraction at the Wyong River Weir for storage in Mardi Dam.

1998: The Councils restructured the Joint Water Supply Committee to include an independent Chairman and adopt the name Gosford/Wyong Councils' Water Authority.

2006: The Central Coast Water Corporation Act 2006 was passed to create one water supply authority on the Central Coast.

2007: Following 15 years of drought in the region a comprehensive drought management strategy, WaterPlan2050, was adopted by the Councils.

WaterPlan2050 detailed a program to expand supply and reduce demand to help secure the water supply until 2050.

2010: A memorandum of understanding was signed to make changes to the Central Coast Water Corporation Act 2006 and these were later passed in Parliament.

2011: The Mardi suite of works was officially completed on 19 January. The works involved construction of a new intake tower and tunnel, two new pump stations and associated pipelines and power upgrades.

The Gosford/Wyong Councils' Water Authority Board was dissolved and a new Central Coast Water Corporation Board was appointed. The Central Coast Water Corporation was formally established.

The official system launch of the Mardi-Mangrove Link took place on 31 August, with the first water pumped along the pipeline from Mardi Dam to Mangrove Creek Dam for storage.

2012: In July, commissioning of the Mardi-Mangrove Link was officially complete and the Councils took ownership of the system.

2016: The former Gosford City and Wyong Shire Councils were merged to form the Central Coast Council. The Central Coast Water Corporation was replaced by a dedicated business unit within Council to manage the fourth largest regional water supply authority in NSW.

Construction of Mardi Dam intake tower

Mardi pumping station

Mardi-Mangrove Link pipelaying

Drinking water catchments

A catchment is an area where water is collected by the natural landscape. In a catchment, rain will eventually flow to a dam, creek, river, lake or ocean or seep into the groundwater system.

Each dam, river and creek has its own catchment. The Central Coast has six catchment areas that provide drinking water to the region with a combined area of 727 square kilometres. They are:

- Lower Wyong River Weir Catchment - 355km^2
- Lower Mangrove Creek Weir Catchment - 140km^2
- Mangrove Creek Dam Catchment - 101km^2
- Ourimbah Creek Weir Catchment - 88km^2
- Mooney Mooney Dam Catchment - 39km^2
- Mardi Dam Catchment - 4km^2

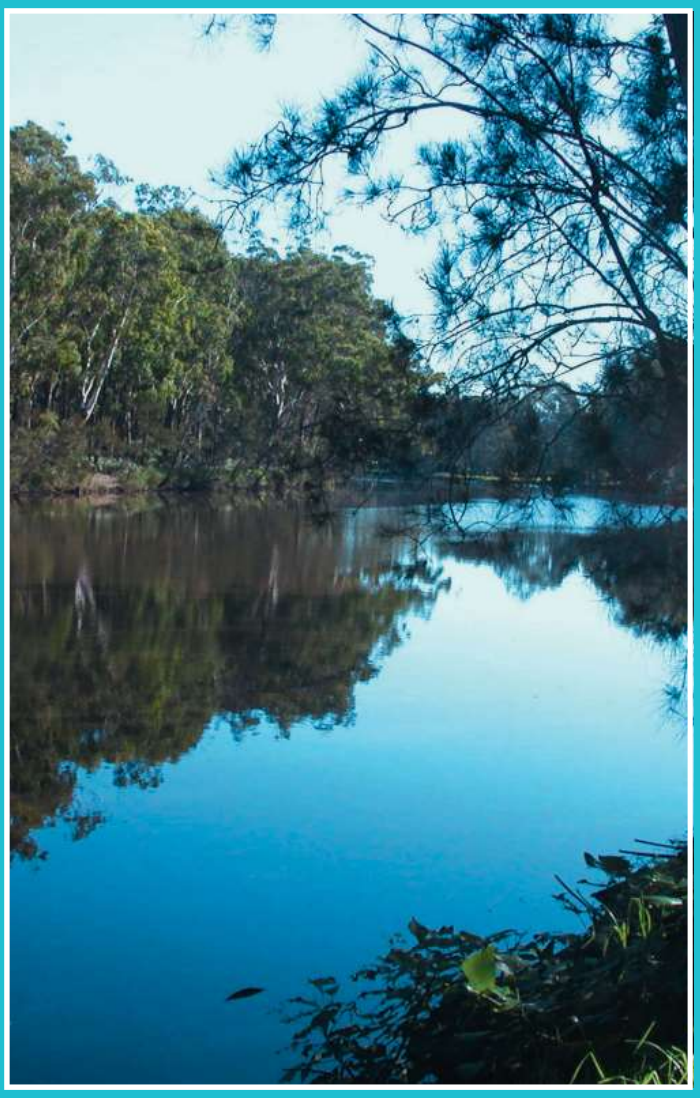
Mangrove Creek Dam

Catchment management

Managing and protecting our catchments effectively is key in ensuring good water quality, and a cornerstone of the Australian Drinking Water Guidelines.

Central Coast Council has catchment policies which identify specific activities that can be carried out within each catchment area.

Access to the area directly surrounding the region's dams is restricted. This protects our water supply by creating a buffer zone to help stop nutrients and other substances that could affect the quality of water entering the dam.



Wyong River

Wyong River Catchment

Dams

Mangrove Creek Dam

Mangrove Creek Dam is the Central Coast's largest dam, located around 40 kilometres north-west of Gosford, in a narrow valley on Mangrove Creek. Constructed between 1978 and 1982, the dam provides 93 percent of the region's water storage. The concrete face rockfill dam with a height of 80 metres can hold up to 190,000 million litres of water.

Mangrove Creek Dam is a large storage dam, not primarily a collection dam. The purpose of the dam is to store water until it is needed. When water demand on the Central Coast increases, water can be released from Mangrove Creek Dam and directed into Mangrove Creek and Wyong River for extraction.

Mardi Dam

Located four kilometres south-west of Wyong, Mardi Dam was built in 1962 and can hold up to 7,400 million litres of water. Mardi Dam is an earth fill dam, with a height of 26 metres and is an off-stream storage dam meaning it is not fed directly by a stream. The dam must be filled by pumping water from Wyong River and Ourimbah Creek, respectively located two kilometres and five kilometres from the dam. Water is pumped to Mardi Water Treatment Plant before being distributed to residents.

Mooney Mooney Dam

Mooney Mooney Dam is the oldest of the region's three dams being built in 1961. Located on Mooney Mooney Creek around 10 kilometres north-west of Gosford, the concrete arch dam with a height of 28 metres has a capacity of 4,600 million litres. Water is pumped to Somersby Water Treatment Plant and then to residents.

Weirs

Lower Wyong River Weir

Lower Wyong River Weir was built in 1968. The weir has a large catchment of 355 square kilometres and a maximum capacity of 300 million litres.

Wyong River pumping station is located upstream of the weir and pumps the water to Mardi Dam, then to Mardi Water Treatment Plant before being distributed to residents for use.

As part of the Mardi-Mangrove Link project that was completed in 2012, the Lower Wyong River Weir includes an Australian first integrated fishway and flow gauge.

In order to ensure enough water is left in Wyong River for local wildlife and the environment, the flow gauge monitors the flow over the weir to determine how much water can be pumped. The fishway ensures fish can easily navigate the weir to move downstream to spawn and, after hatching, swim upstream to grow.

Wyong River Weir Fishway

Lower Mangrove Creek Weir

Lower Mangrove Creek Weir was built in 1975. The weir has a catchment area of 140 square kilometres and a maximum capacity of 300 million litres.
Water from Lower Mangrove Creek Weir is pumped 14 kilometres into Somersby Water Treatment Plant before being distributed to residents for use.
In dry times additional water can be released from Mangrove Creek Dam, into Mangrove Creek, and then pumped from the weir to the treatment plant.

Ourimbah Creek Weir

Fishway

Ourimbah Creek Weir was built in 1978. The weir has a catchment area of 88 square kilometres and a maximum capacity of 100 million litres.
Water from Ourimbah Creek Weir is pumped 5.6 kilometres to Mardi Dam, then to Mardi Treatment Plant before being distributed to residents for use.

Water Treatment Plants

A water treatment plant is where the water from our rivers, creeks, dams and bores is filtered and disinfected to make it safe to drink.

The Central Coast water supply has two water treatment plants and a bore water treatment plant that delivers water that complies with the quality standards within the Australian Drinking Water Guidelines to residents.

The water supply system has been built to enable water from the two water treatment plants to be transferred across the region when needed.

Treated water from Somersby and Mardi Water Treatment Plants can be moved around the region via the Coastal Connection and Western Connection pipelines.

Somersby Water Treatment Plant

Somersby Water Treatment Plant was built in two stages in 1971 and 1986 and can treat water from Mangrove Creek Dam or Mooney Mooney Dam. The plant has a maximum supply capacity of 146 million litres per day, or 1666 litres per second. The capacity equates to 57.6 Olympic swimming pools per day.

The plant operates 365 days a year.

Mardi Water Treatment Plant

Mardi Water Treatment Plant was originally built in 1982 and upgraded in 1992 to increase the capacity. The plant treats water from Mardi and Mangrove Creek Dam and has a supply capacity of 160 million litres per day, or 1850 litres per second. The capacity equates to 64 Olympic swimming pools per day. The plant operates 365 days a year. A further upgrade to the plant is planned which will establish the facility as the principal drinking water supply for the Central Coast.

Woy Woy Bore Water Treatment Plant

Woy Woy Bore Water Treatment Plant was built in 2007 as an emergency supply during the drought. The plant can treat water extracted from Woy Woy groundwater bore field and has a maximum supply capacity of five million litres per day.

The plant operates as required to supplement the larger surface water treatment plants (Mardi and Somersby). This is generally in periods of low water storage, however may be used at other times when appropriate to manage supply and demand.

The plant produces water to the same standard as Mardi and Somersby Water Treatment Plants. Water is supplied to the Peninsula.

Mardi-Mangrove Link

The Mardi-Mangrove Link is a 21 kilometre pipeline that allows water to be transferred from Wyong River and Ourimbah Creek during high flows, via Mardi Dam to the large Mangrove Creek Dam for storage, instead of allowing it to flow to the ocean. The Mardi-Mangrove Link will help boost dam storage levels and help protect the region against future extended periods of below average rainfall. Water can also be released to Mardi Dam when storage levels are low.

Construction of the Mardi-Mangrove Link started in March 2010 and the project was officially completed in July 2012. The Mardi-Mangrove Link was the largest water infrastructure project completed on the Central Coast since the mid-1980s when Mangrove Creek Dam was built.

The Mardi-Mangrove Link project involved building:

- a 2.1 kilometre buried water pipeline from Wyong River to Mardi Dam
- a 19 kilometre buried water pipeline from Mardi Dam to the existing Bunning Creek Tunnel at Mangrove Creek Dam, running through Yarramalong Valley
- a new pump station at Mardi Dam
- a new pump station beside Wyong River.

Hunter Connection

Water can also be transported into the Central Coast water supply system by the Hunter Connection. This two-way pipeline provides additional water during periods of drought for both the Central Coast and Hunter regions.

The Central Coast Council has a two-way agreement with Hunter Water Corporation for transfers of treated drinking water between the systems when supplies are low. The link has the capacity to provide up to 33 million litres of drinking water a day, when required.

Construction of the pipeline was completed in December 2006 and included building a 30 kilometre pipeline from Morisset to Warnervale, building pipelines between Balmoral and Dora Creek in the Hunter Region and building two new pump stations at Fennell Bay and Morisset.

Mardi to Warnervale Pipeline

Work will begin in 2020 on a major pipeline linking Mardi Water Treatment plant to the Central Coast's rapidly growing northern suburbs. The nine-kilometre pipeline will run below ground level to a new valve house at Sparks Rd, Warnervale.

The Mardi-Warnervale Link will deliver several benefits:

- secure water supply and operational pressure to the Central Coast's northern areas including the major growth hub of Warnervale Town Centre
- increase the capacity for water sharing between Central Coast and lower Hunter region
- replace ageing trunk mains between Tuggerah and Kanwal
- establishment of a new reservoir zone ahead of the construction of a future reservoir.

Other water sources

Groundwater borefields

The Central Coast region has groundwater borefields at Woy Woy and other minor groundwater sources throughout the region where water is extracted from below the ground.

The bore water is transferred to the water treatment plants at Woy Woy, Somersby and Mardi where it is treated to meet Australian Drinking Water Guidelines. The Woy Woy Bore Water treatment plant has the capacity to treat five million litres of bore water each day.

Groundwater Borefields Pump

Stormwater harvesting

Stormwater is rainwater that runs off urban surfaces such as roofs, pavements, car parks, roads, gardens and parks. Some stormwater run-off from paved services is diverted to pipes, collected in underground tanks or open basins and then treated and pumped as required.

Harvested stormwater is used across the Central Coast for the irrigation of parks and gardens, ovals and golf courses and other non-drinking water purposes.

Stormwater harvesting reduces demand on the region's drinking water supplies and minimises the impact of stormwater run-off on the region's local waterways.

Stormwater harvesting

Water recycling

Central Coast Council utilises recycled water as one approach towards the long-term management of the water supply. The reliable delivery of water and sewerage services for the Central Coast ensures confidence in public health and environmental protection.

Recycled water is waste water that has been harvested from the sewerage system and highly treated for reuse. All recycled water must comply with strict NSW Health guidelines.

Council has water recycling plants at all sewage treatment plants including Bateau Bay, Charmhaven, Gwandalan, Mannering Park, South Wyong, Toukley, Kincumber and Woy Woy. The water is recycled for use in power stations and on playing fields and at Toukley, Magenta and Shelly Beach golf courses. Council is also exploring other ways recycled water can be used.

Recycled water meter

Recycled water reuse

Kincumber recycled water plant

love water use it wisely

Our water is a precious resource and if we each use a little less every day, we can help secure our water supply for years to come.
Across the Central Coast, 80% of all water is used by households. The Central Coast has a daily water use target of 150 litres per person. By aiming for this and using water wisely at home, you will save both water and money!

Outside your home

About 70% of water is used for everyday inside activities like showering, flushing toilets, washing dishes and laundry.

Here are some simple ways to save water inside your home:

- choose water saving behaviours such as taking shorter showers, using the half flush on the toilet and turning the tap off when brushing your teeth, washing hands or shaving
- only run the washing machine and dishwahser on a full load
- install water and energy efficient devices including showerheads, dual flush toilets, taps, washing machines and dishwashers
- check for leaky taps, toilet or water pipes and contact a licensed plumber if you can't find the source of the leak.

'Whizzy is our water saving mascot on the Central Coast'

Outside your home

About 30% of our drinking water is used for outside activities like watering your garden, washing your car or maintaining your pool.

Here are some simple ways to save water outside your home:

- choose native and drought tolerant plants in your garden
- apply mulch or compost to the soil to help prevent water loss
- use greywater from your shower, bathtub or washing machine on your garden
- use a rainwater tank to water gardens, wash vehicles and top up pools
- use a broom or rake to sweep paths and driveways, instead of using a hose
- use a pool cover to reduce evaporation and the need to top up your pool
- avoid using fixed hoses or sprinlers as these devices use large amounts of water
- use a trigger nozzle on your hose.

For current information on water restrictions and water saving tips visit **centralcoast.nsw.gov.au/lovewater**

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