Beachwatch

State of the beaches 2021–22

South Coast Region

Department of Planning and Environment

NSW GOVERNMENT

Front cover: Tilbury Cove (Beachwatch/DPE)

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Contents

Recreational water quality has been monitored in the South Coast region since 2002 by Shoalhaven City Council and Eurobodalla Shire Council under the Department of Planning and Environment's Beachwatch Partnership Program. This report summarises the performance of 21 swimming sites on the south coast of NSW, providing a long-term assessment of how suitable a site is for swimming. Monitored sites include ocean beaches and an estuarine swimming site in Wagonga Inlet.

In 2021–2022, 90% of swimming sites in the South Coast region were graded as Good or Very Good, including 18 ocean beaches. These sites were suitable for swimming for most or almost all of the time. While this is an excellent result, it is a slight decline in performance from previous years, and reflects the very wet summer conditions.

South Coast region summary 2021–2022

Bawley Point Beach
Photo: Beachwatch/DPE

Beach monitoring in NSW

The water quality of beaches and other swimming locations is monitored under the NSW Government's Beachwatch programs to provide the community with accurate information on the cleanliness of the water and to enable individuals to make informed decisions about where and when to swim. Routine assessment also measures the impact of pollution sources, enables the effectiveness of stormwater and wastewater management practices to be assessed and highlights areas where further work is needed.

Swimming sites in NSW are graded as Very Good, Good, Fair, Poor or Very Poor in accordance with the National Health and Medical Research Council's 2008 *Guidelines for Managing Risks in Recreational Waters*. These Beach Suitability Grades provide a long-term assessment of how suitable a beach is for swimming. The grades are determined from the most recent 100 water quality results (2–4 years' worth of data depending on the sampling frequency) and a risk assessment of potential pollution sources.

See the section on **Quality assurance** in the Statewide Summary for results of the quality assurance program.

Recreational water quality has been monitored on the South Coast by Shoalhaven Council and Eurobodalla Shire Council since 2002.

A **quality assurance** program ensures the information collected and reported by Beachwatch and its partners is accurate and reliable.

Rainfall impacts

During 2021–2022, 21 swimming sites were monitored including ocean beaches and an estuarine swimming site.

Rainfall is the major driver of pollution to recreational waters, generating stormwater runoff and triggering untreated discharges from the wastewater treatment and transport systems. Changes in rainfall patterns are reflected in beach water quality over time due to variation in the frequency and extent of stormwater and wastewater inputs.

The Beach Suitability Grades for 2021–2022 are based on water quality data collected over the last 2–4 years. Rainfall over this period has been diverse:

- 2018–2019: prolonged dry weather conditions broken by wet summer months
- 2019–2020: well below average rainfall, except for a wet February 2020 and some isolated wet weather

- 2020–2021: variable rainfall with some wet months
- 2021–2022: a very wet summer and autumn, including significant wet weather and flooding events.

See the section on **How to read this report** on page 36 for an explanation of the graphs, tables and Beach Suitability Grades.

Rainfall was variable throughout winter 2021, with overall winter rainfall totals below average, with a notably dry July.

While rainfall for September and October 2021 was average, November was significantly wet. Ulladulla received record high November rainfall with 268 mm, and more than double the average long-term monthly rainfall was recorded at Batemans Bay and Jervis Bay with 198 mm and 190 mm, respectively.

Summer was very wet with average to above average rainfall recorded on the South Coast. Jervis Bay had its wettest summer on record with 536 mm of rainfall. More than one and half times the average summer rainfall was recorded at Moruya Heads and Ulladulla, with 458 mm and 430 mm. Consecutive days of heavy rain fell in early January 2022 and late February 2022 at many areas on the South Coast.

March 2022 was significantly wet with well above average rainfall totals recorded on the South Coast. Ulladulla and Jervis Bay received record high March total rainfall, with 726 mm and 544 mm for the month, respectively. Moruya Heads had its wettest March since 1976 with 330 mm for the month. The severe wet weather caused flooding of coastal waterways, and natural and mechanical opening of lakes and rivers. Advisories were issued by councils to avoid swimming due to stormwater and floodwater impacts at ocean beaches.

Rainfall totals for April 2022 were above average, with more than double the long-term monthly average rainfall recorded at Jervis Bay and Moruya Heads, with 303 mm and 330 mm, respectively.

Debris washed up at Racecourse Beach following extreme wet weather in March 2022

Photo: Greg Howarth/ Shoalhaven City Council

Flooding and water quality

Monitoring and observations by councils on the South Coast showed flooding events impacted swimming sites beyond the flood zones, making microbial water quality unsuitable for swimming at some sites. The most affected areas were in estuaries, or ocean beaches located near creeks, lagoons and rivers, which carry the floodwaters.

While microbial levels returned to normal at many swimming sites, there was still a large amount of debris or other hazards, such as murky water, which posed a risk to recreational activities.

Marine algal blooms

Marine algal bloom present in the water

Photo: Chad Weston/NPWS, DPE

There were no reports of marine algae blooms impacting recreational water quality in the South Coast region during 2021–2022.

The appearance of **marine algae** is sometimes mistaken for **sewage contamination** or **oil slicks**, due to a strong odour and red or brown discolouration in the water caused by the blooms.

If alga is present, direct contact should be avoided as it can cause skin and eye irritations. Marine algae blooms usually dissipate with changes in tide and wind conditions.

Health risks

Contamination of recreational waters with faecal material from animal and human sources can pose significant health problems to beach users owing to the presence of pathogens (disease-causing micro-organisms) in the faecal material. The most common groups of pathogens found in recreational waters are bacteria, protozoans and viruses.

Exposure to contaminated water can cause gastroenteritis, with symptoms including vomiting, diarrhoea, stomach-ache, nausea, headache and fever. Eye, ear, skin and upper respiratory tract infections can also be contracted when pathogens come into contact with small breaks and tears in the skin or ruptures of the delicate membranes in the ear or nose.

Certain groups of users may be more vulnerable to microbial infection than others. Children, the elderly, people with compromised immune systems, tourists, and people from culturally and linguistically diverse backgrounds are generally most at risk.

Beach Suitability Grades for South Coast region

Swimming site	Site type	Beach Suitability Grade	Change
Shoalhaven City Council			
Shoalhaven Heads Beach	Ocean beach	VG	○
Tilbury Cove	Ocean beach	VG	○
Warrain Beach	Ocean beach	VG	○
Collingwood Beach	Ocean beach	VG	○
Cudmirrah Beach	Ocean beach	VG	○
Mollymook Beach	Ocean beach	VG	○
Rennies Beach	Ocean beach	VG	○
Racecourse Beach	Ocean beach	VG	○
Bawley Point Beach	Ocean beach	VG	○
Merry Beach	Ocean beach	VG	○
Eurobodalla Shire Council			
Cookies Beach	Ocean beach	VG	○
Caseys Beach	Ocean beach	P	↓
Surf Beach	Ocean beach	P	○
Malua Bay Beach	Ocean beach	G	↓
Broulee Beach	Ocean beach	G	○
South Broulee (Bengello) Beach	Ocean beach	VG	○
Shelley Beach (Moruya Heads)	Ocean beach	G	○
Tuross Main Beach	Ocean beach	G	○
Brou Beach	Ocean beach	VG	○
Wagonga Inlet	Estuarine	G	○
Narooma Main Beach	Ocean beach	G	○

Beach Suitability Grade					Change		
VG	G	F	P	VP	↑	○	↓
Very Good	Good	Fair	Poor	Very Poor	Improved	Stable	Declined

Shoalhaven City Council

100%
ocean beaches graded Good or Very Good

Overall results

All 10 swimming sites were graded as Very Good in 2021–2022. This is an outstanding result and a similar performance to previous years.

Percentage of sites graded as Very Good or Good

	2019–2020	2020–2021	2021–2022	Trend
Ocean beaches (10 sites)	100%	100%	**100%**	

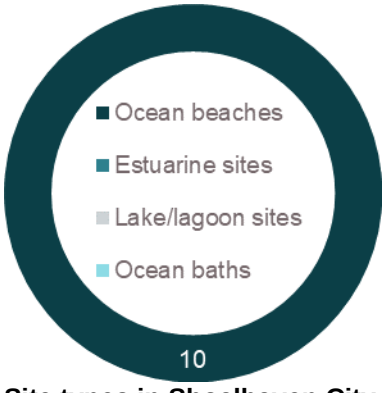
Ten swimming sites were monitored by Shoalhaven City Council. Samples were collected weekly between December and February and sampling and laboratory analysis was fully funded by the council.

See the section on **How to read this report** on page 36 for an explanation of the graphs, tables and Beach Suitability Grades.

Best beaches

Shoalhaven Heads Beach, Tilbury Cove, Warrain Beach, Collingwood Beach, Cudmirrah Beach, Mollymook Beach, Rennies Beach, Racecourse Beach, Bawley Point Beach and Merry Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.



Site types in Shoalhaven City Council

Ocean beaches were the only site type monitored in the Shoalhaven region.

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Beach Suitability Grades for Shoalhaven City Council ocean beaches

Ocean beaches

All 10 ocean beaches continued to be graded as Very Good in 2021–2022: Shoalhaven Heads Beach, Tilbury Cove, Warrain Beach, Collingwood Beach, Cudmirrah Beach, Mollymook Beach, Rennies Beach, Racecourse Beach, Bawley Point Beach and Merry Beach.

While water quality at these sites was suitable for swimming almost all of the time, elevated bacterial levels were occasionally recorded at some of the beaches following heavy rainfall.

Management

Shoalhaven City Council

The Lower Shoalhaven River, Lake Conjola, St Georges Basin/Sussex Inlet, Swan Lake, Berrara Creek, Open Coast and Jervis Bay coastal management programs (CMPs) are currently being developed by Shoalhaven City Council in partnership with the Department of Planning and Environment (DPE). The remaining estuaries within the Shoalhaven will either have a consolidated or individual CMP that will provide a strategic management program for the area. Council has several pre-existing Estuary Management Plans (EMPs) for the major estuaries within the LGA, which will be incorporated and superseded when the remaining CMPs are developed. Council has been implementing actions from the pre-existing EMPs that include restoring and maintaining riparian corridors, coastal wetlands and eroding streams and foreshores, which have worked to improve the water quality within the estuary catchments.

A **coastal management program** (CMP) outlines a long-term strategy for managing the coast, in line with the *Coastal Management Act 2016*.

The NSW Government provides guidance and funding through the Coastal and Estuary Grants Program for local councils to prepare and implement CMPs.

Funding to assist council with the development of these CMPs has been provided under the NSW Government's Coastal and Estuary Grants Program. The CMPs will identify risks, issues and concerns from coastal and catchment pressures and prioritise management actions to mitigate these identified issues. Management actions including infrastructure improvements, restoration and maintenance of riparian areas, and strategic land-use planning, will be considered during the development of these programs.

Until it is superseded by CMPs, Shoalhaven City Council is also coordinating the implementation of the Shoalhaven Coastline Coastal Zone Management Plan (CZMP). Council has received funding under the NSW Government's Coastal and Estuary Grants Program to implement a number of its recommendations. During 2021–2022 council has used the funding to develop a beach asset management strategy,

prepare an integrated environmental monitoring program and to undertake restoration works within coastal wetlands, bushland and dunes. Council is about to commence a coastsnap citizen science beach monitoring program for beaches and lake entrances within the Shoalhaven local government area.

Merry Beach
Photo: Beachwatch/DPE

Following the 2019–2020 bushfires, council installed erosion and sediment control structures at priority locations and is monitoring water quality and estuary health within 7 estuaries impacted by the bushfire. Council has developed the South-East Catchments and Waterways Bushfire Recovery Plan in collaboration with Eurobodalla and Bega Valley Shire councils. Council continues to undertake remediation works in priority locations identified within the plan, with an aim to reduce impacts on waterways in the medium to long term. These projects are funded by the NSW Government's Bushfire Affected Coastal Waterways – Coastal and Estuary Grants Program.

As part of the Northern Shoalhaven Reclaimed Water Management Scheme (REMS), an average of 70% of treated wastewater from the Callala, Huskisson/Vincentia, Culburra/Greenwell Point and St Georges Basin wastewater treatment plants (WWTPs) is recycled onto land, significantly reducing the amount of effluent released to the ocean. Previous discharge of treated effluent to Jervis Bay has been phased out, as a result of the scheme. The second stage of REMS was commissioned in 2019. This included major upgrades to Nowra and Bomaderry WWTPs and connection into the existing REMS distribution network. The upgrades will significantly reduce the nutrient discharge volumes to the Shoalhaven River, increase treated effluent quality and double the volume available for beneficial re-use through the REMS network.

Sampling sites and Beach Suitability Grades in Shoalhaven City Council

Shoalhaven Heads Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Shoalhaven Heads Beach is located towards the southern end of Seven Mile Beach at Shoalhaven Heads.

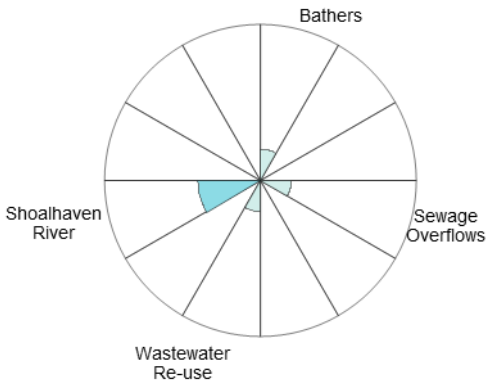
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels had little response to rainfall and generally remained below the safe swimming limit across all rainfall categories.

The site was monitored from 2003 to 2004 and since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	91%	52	Stable

Sanitary inspection: Low



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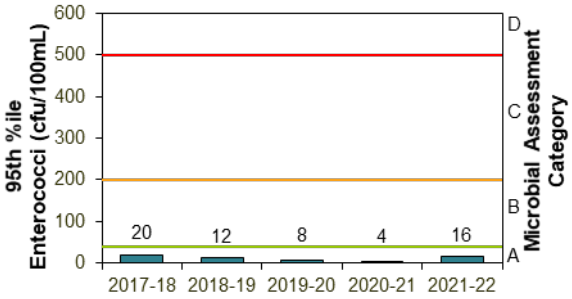
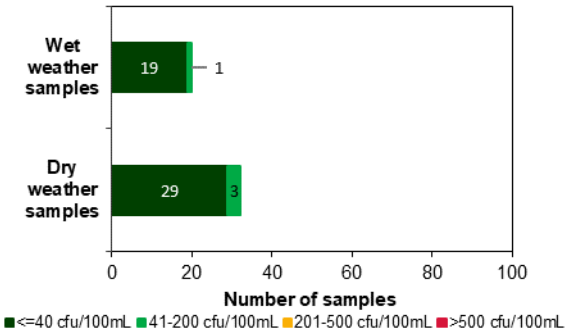
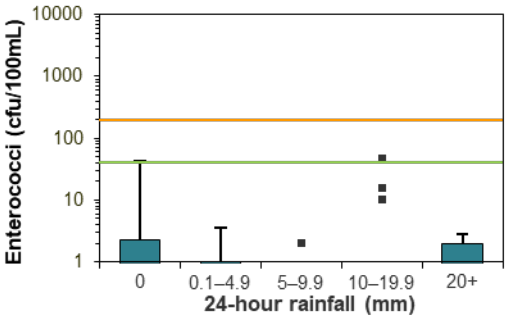


Dry and wet weather water quality

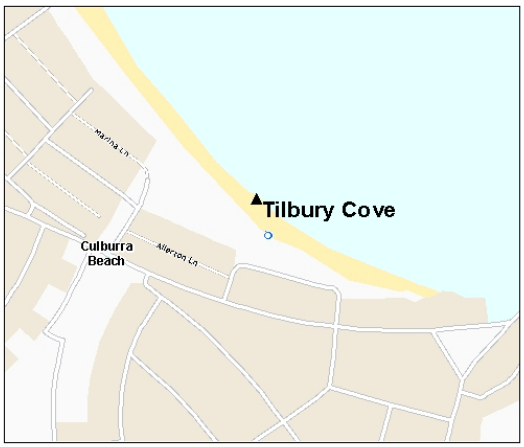


Water quality in response to rainfall



Tilbury Cove

Beach grade: VG



See ‘How to read this report’ for key to map.

Tilbury Cove is located towards the south-eastern corner of Culburra Beach.

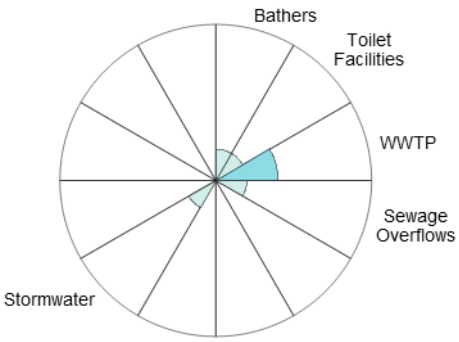
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few sources of minor faecal contamination.

Enterococci levels had little response to rainfall and remained below the safe swimming limit across all rainfall categories.

The site was monitored from 2002 to 2004 and since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	55	Stable

Sanitary inspection: Low



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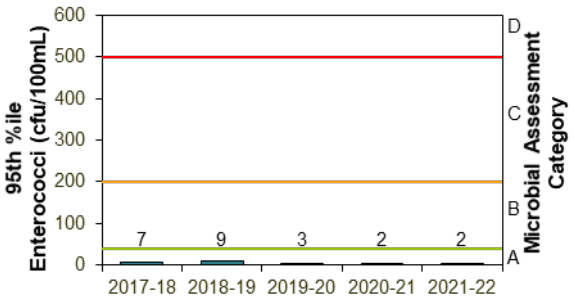
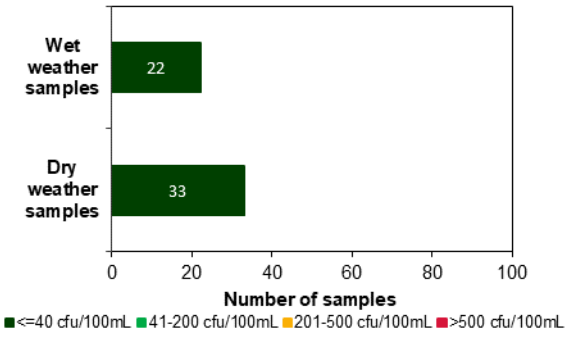
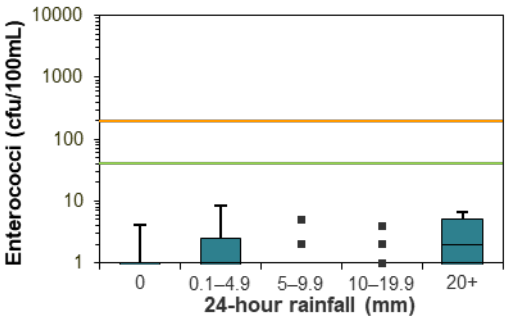


Dry and wet weather water quality



Water quality in response to rainfall



Warrain Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Warrain Beach is located to the south of Penguin Head. The beach is patrolled over the summer months.

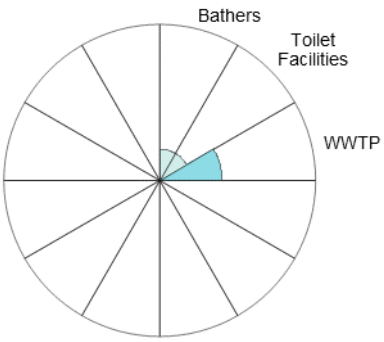
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall but generally remained below the safe swimming limit across all rainfall categories.

The site has been monitored since 2007.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	55	Stable

Sanitary inspection: Low



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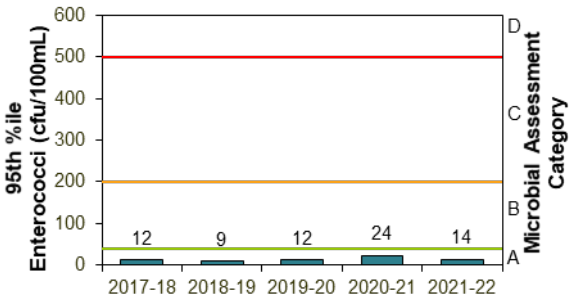
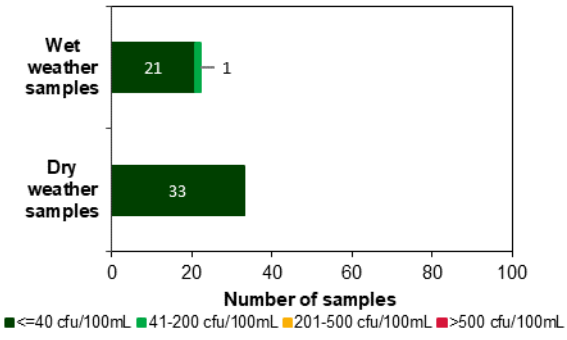
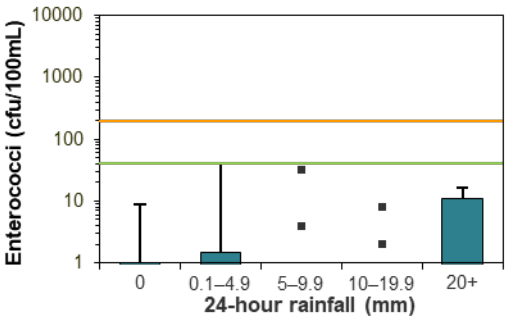


Dry and wet weather water quality



Water quality in response to rainfall



Collingwood Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Collingwood Beach is located in Jervis Bay, adjacent to the town of Vincentia. The beach is approximately 2 km long.

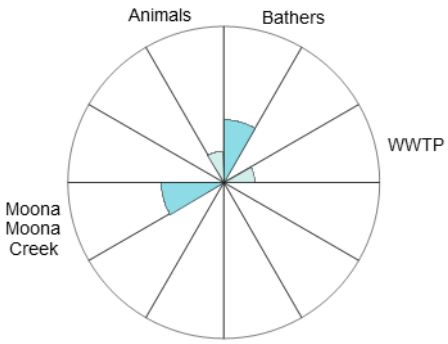
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall but remained below the safe swimming limit across all rainfall categories.

The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	55	Stable

Sanitary inspection: Low



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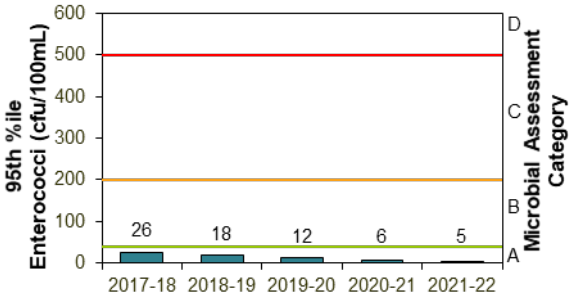
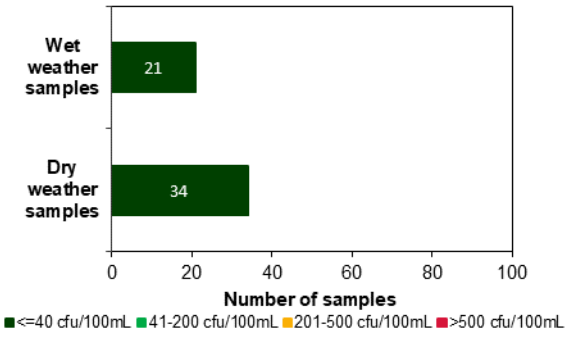
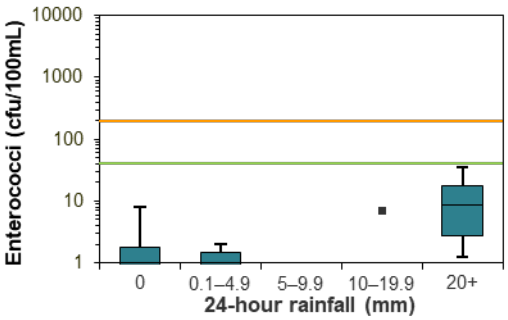


Dry and wet weather water quality

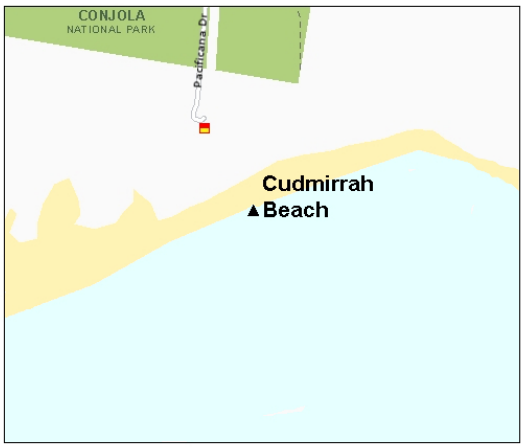


Water quality in response to rainfall



Cudmirrah Beach

Beach grade: VG



See ‘How to read this report’ for key to map.

Cudmirrah Beach is the main surf beach for the township of Sussex Inlet. The beach is approximately 3 km long.

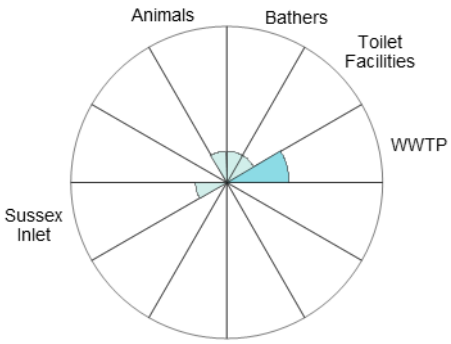
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall but generally remained below the safe swimming limit across all rainfall categories.

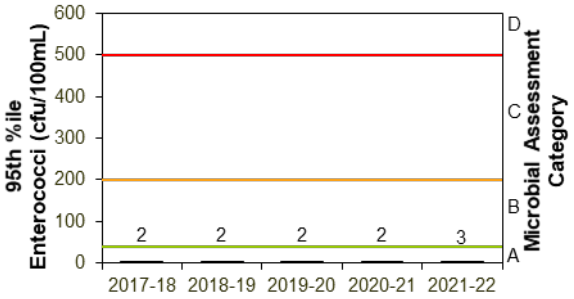
The site was monitored from 2003 to 2004 and since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	55	Stable

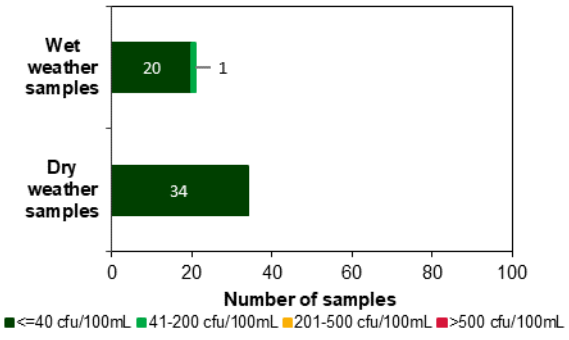
Sanitary inspection: Low



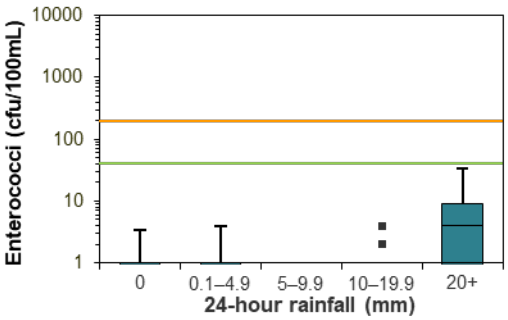
Microbial Assessment Category: A



Dry and wet weather water quality

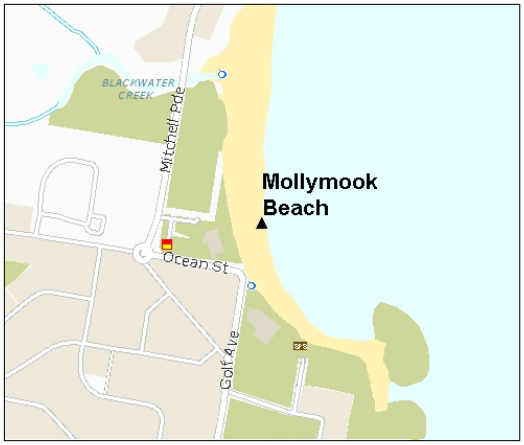


Water quality in response to rainfall



Mollymook Beach

Beach grade: VG



See ‘How to read this report’ for key to map.

Mollymook Beach is a popular beach that stretches for approximately 2 km. The beach is patrolled during the warmer months.

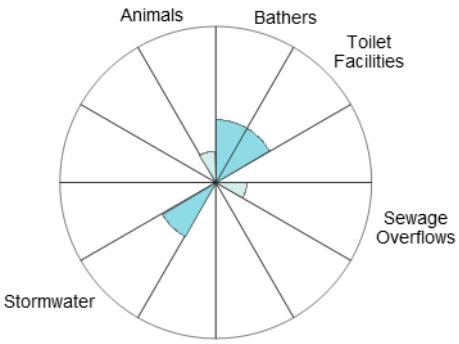
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall and generally remained below the safe swimming limit across most rainfall categories.

The site was monitored from 2002 to 2003 and since 2008.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	55	Stable

Sanitary inspection: Low



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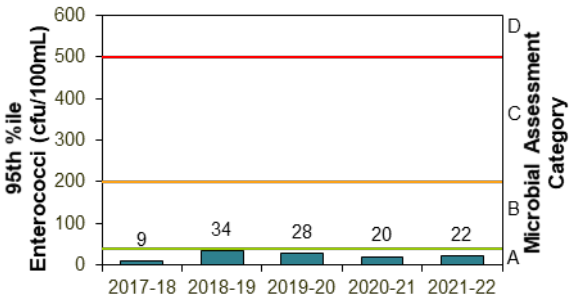
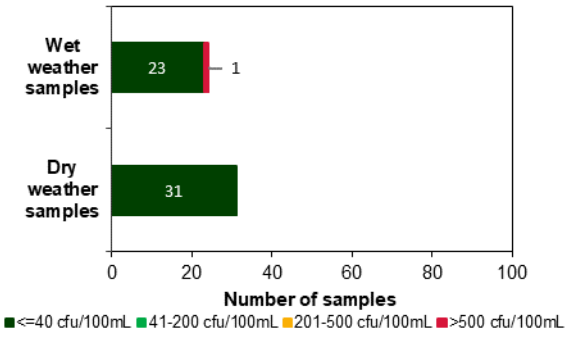
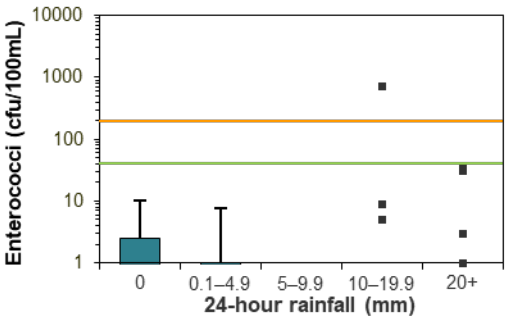


Dry and wet weather water quality



Water quality in response to rainfall



Rennies Beach

Beach grade: VG

Rennies Beach is located near the town of Ulladulla. The beach is approximately 600 m long.

The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

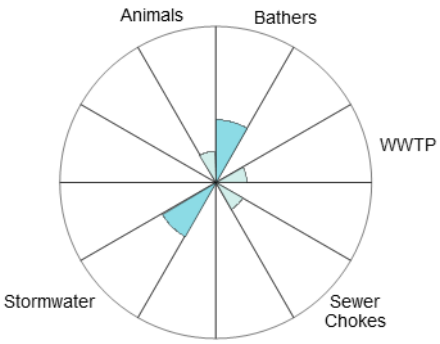
Enterococci levels had little response to rainfall and remained below the safe swimming limit across all rainfall categories.

The site has been monitored since 2006.

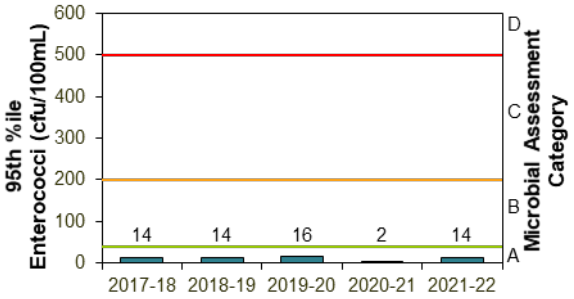
See 'How to read this report' for key to map.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	55	Stable

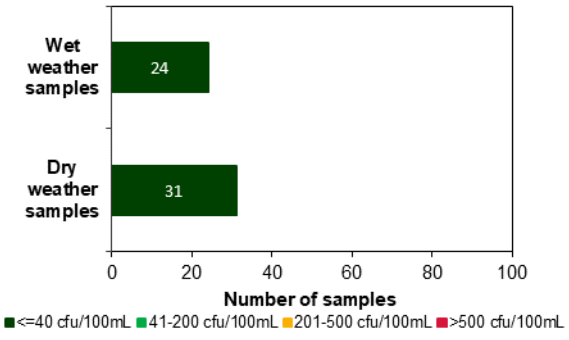
Sanitary inspection: Low



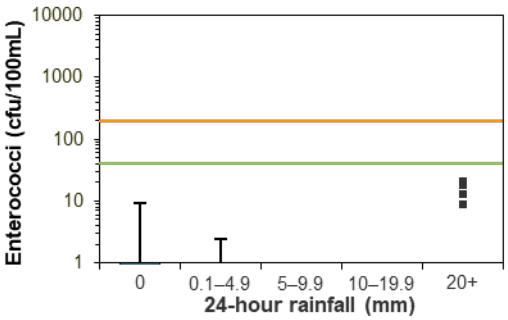
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Racecourse Beach

Beach grade: VG

Racecourse Beach is located near the town of Ulladulla. The beach is approximately 1 km long.

The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

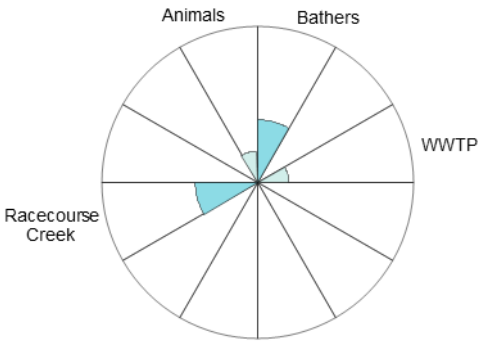
Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to 10 mm or more of rain.

The site was monitored from 2002 to 2004 and since 2006.

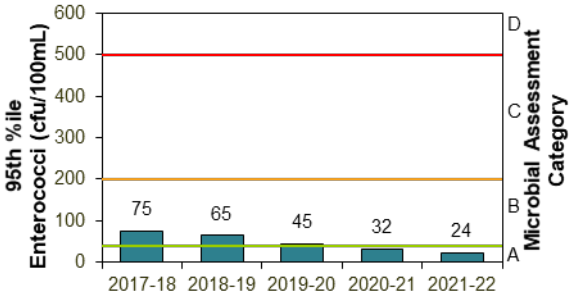
See ‘How to read this report’ for key to map.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	97%	55	Stable

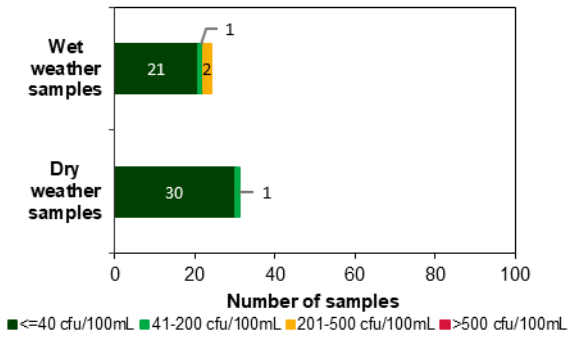
Sanitary inspection: Low



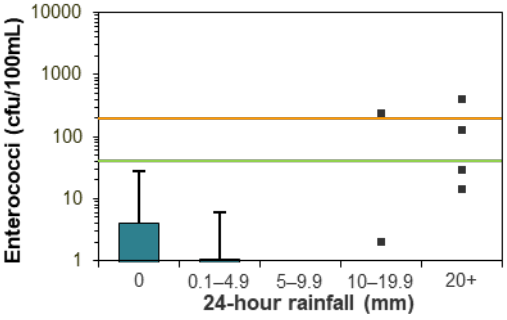
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Bawley Point Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Bawley Point Beach is located on the northern side of Bawley Point and is approximately 250 m long.

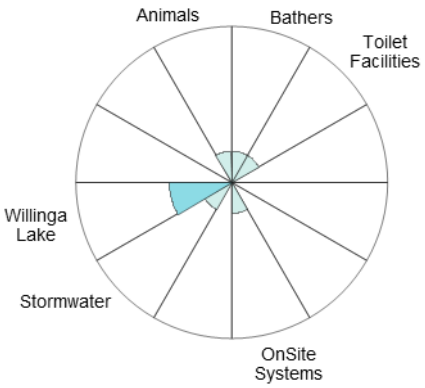
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels had little response to rainfall and remained below the safe swimming limit across all rainfall categories.

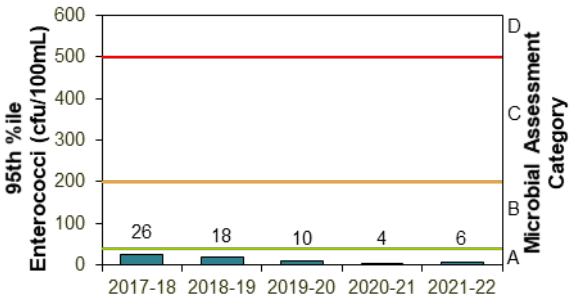
The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	54	Stable

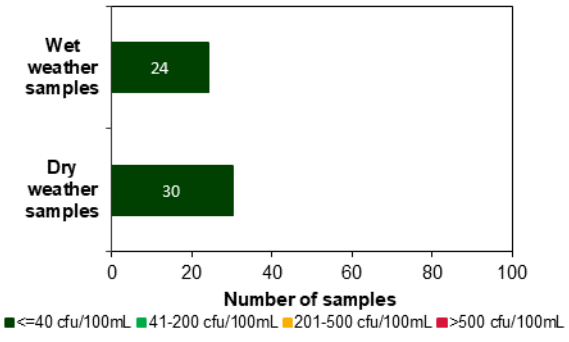
Sanitary inspection: Low



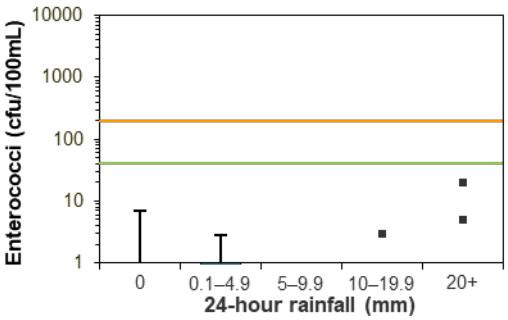
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Merry Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Merry Beach is located south of the town of Kioloa. The beach is approximately 400 m long and is backed by a reserve and caravan park.

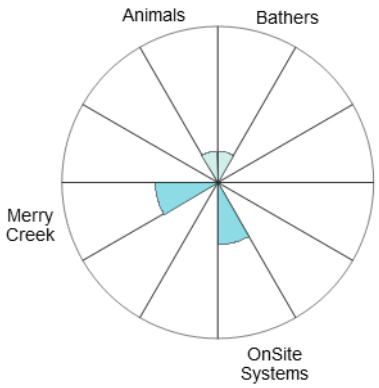
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of faecal contamination.

Enterococci levels had little response to rainfall and generally remained below the safe swimming limit across all rainfall categories.

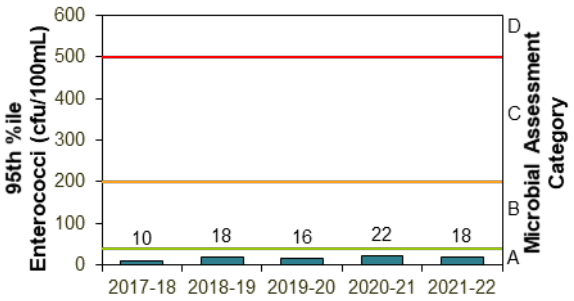
The site has been monitored since 2006.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Dec 2017 to Feb 2022	100%	54	Stable

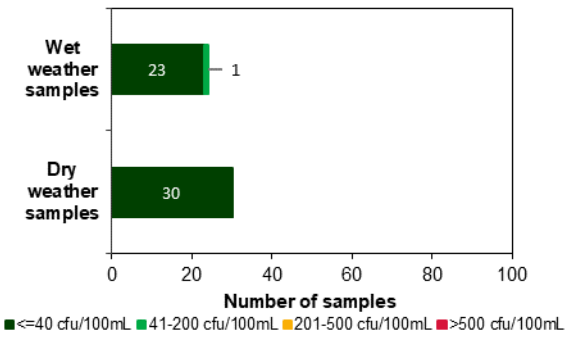
Sanitary inspection: Low



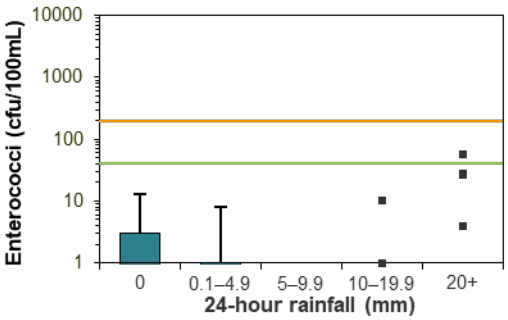
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Eurobodalla Shire Council

Overall results

80%
ocean beaches graded Good or Very Good

Nine of the 11 swimming sites were graded as Very Good or Good in 2021–2022. This is a slight decline in performance from previous years.

Percentage of sites graded as Very Good or Good

	2019-2020	2020-2021	2021-2022	Trend
Ocean beaches (10 sites)	90%	90%	**80%**	
Estuarine sites (1 sites)	100%	100%	**100%**	

Eleven swimming locations were monitored by Eurobodalla Shire Council. Samples were collected weekly between November and March and sampling and analysis was fully funded by the council.

See the section on **How to read this report** on page 36 for an explanation of the graphs, tables and Beach Suitability Grades.

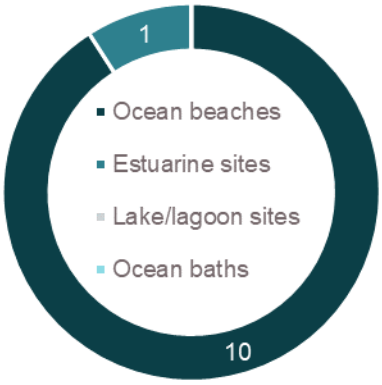
Best beaches

Cookies Beach, South Broulee (Bengello) Beach and Brou Beach.

These sites had excellent water quality and were suitable for swimming almost all of the time.

Swimming sites monitored in the Eurobodalla region include ocean beaches and an estuarine area in Wagonga Inlet, with each site type having a different response to rainfall-related impacts.

In general, estuarine swimming sites do not perform as well as ocean beaches, due to lower levels of flushing increasing the time needed to disperse and dilute pollution inputs, taking longer to recover from stormwater events.



Site types in Eurobodalla Shire Council

As a general precaution swimming should be avoided during and for at least one day after heavy rain at ocean beaches, and for up to 3 days in estuarine areas, or if there are signs of stormwater pollution such as discoloured water or floating debris.

Ocean beaches

Beach Suitability Grades for Eurobodalla Shire Council ocean beaches

Eight of the 10 ocean beaches were graded as Very Good or Good in 2021–2022.

Cookies Beach, South Broulee (Bengello) Beach and Brou Beach continued to be graded as Very Good. Water quality at these sites was suitable for swimming almost all of the time.

Malua Bay Beach, Broulee Beach, Shelley Beach, Tuross Main Beach and Narooma Main Beach were graded as Good in 2021–2022. While water quality at these sites was frequently suitable for swimming during dry weather conditions, elevated enterococci levels sometimes exceeded the safe swimming limit following rain.

Caseys Beach and Surf Beach were graded as Poor in 2021–2022. Elevated bacterial levels were recorded during dry weather conditions, and increased following rainfall. Despite this, 87% and 67% of dry weather samples were within the safe swimming limit at Caseys Beach and Surf Beach, respectively.

Microbial water quality at these beaches has continued to decline for several years, with microbial water quality at Caseys Beach crossing the threshold from Good to Poor. While there was a slightly higher proportion of samples collected during wet weather when compared to the 2020–2021 assessment, the continued decline in microbial water quality requires further investigation. Eurobodalla Shire Council continues to investigate the cause of microbial contamination contributing to poor water quality at Surf Beach, and plans to undertake genetic analysis to determine if

contamination is from animal or human sources. Council plans to commence investigating the cause of microbial contamination at Caseys Beach in the near future.

It is recommended to avoid swimming during and for at least one day following rainfall at ocean beaches or if there are signs of stormwater pollution such as discoloured water and floating debris.

Estuarine beaches

Beach Suitability Grades for Eurobodalla Shire Council estuarine beaches

Wagonga Inlet continued to be graded as Good in 2021–2022, similar to previous years. While water quality at this site was mostly suitable for swimming, elevated enterococci results were occasionally recorded after light rain, and regularly after heavy rainfall. Pollution inputs from elsewhere within Wagonga Inlet may impact water quality at this site.

Swimming should be avoided during and for up to 3 days after rainfall, or if there are signs of pollution such as discoloured water or floating debris.

Management

Eurobodalla Shire Council

The Moruya River, Mummuga Lake and Wagonga Inlet CMPs are nearing completion. Council is working with DPE to progress this project and has identified water quality management opportunities to improve stormwater infrastructure, and enhance riparian corridors and estuary health.

The Eurobodalla Open Coast CMP is also currently in progress, with funding and technical assistance from the NSW Government's Coastal and Estuary Grants Program. The focus of this program is on areas that are or are expected to be affected by coastal hazards now and into the future, with particular attention on places where council, community or private assets could be at risk from coastal hazards such as erosion and inundation including the impacts of sea level rise. The CMP has been developing management actions to address these risks.

During 2021–2022 Eurobodalla Shire Council has continued to undertake restoration works within dunes and bushland along the coast to enhance natural defences to coastal hazards and

create a resilient coastline. These works follow on from previous works also funded under the NSW Government's Coastal and Estuary Grants Program.

A **coastal management program** (CMP) outlines a long-term strategy for managing the coast, in line with the *Coastal Management Act 2016*.

The NSW Government provides guidance and funding through the Coastal and Estuary Grants Program for local councils to prepare and implement CMPs.

Council has been investigating the water quality at Surf Beach since 2019, which is at times identified as poor. The investigation is searching for potential sources of contamination in the catchments draining to Surf Beach Creek and Surf Beach. The public toilet block adjacent to Surf Beach Creek was demolished, and a new toilet block was completed in 2022. Council completed dye testing at the toilet block, which showed there was no contamination from this facility. Council is currently liaising with CSIRO to conduct genetic analysis of samples to identify whether faecal contamination detected at Surf Beach is from human or animal sources.

Council also has several plans that guide the management of estuaries along the coast. Council and Local Land Services have been implementing actions from these plans to restore and maintain riparian corridors, coastal wetlands, and eroding streams and foreshores, to improve water quality discharging to the estuaries.

Following the 2019–2020 bushfires council has been installing erosion and sediment control structures, replanting, and removing weeds at priority locations within catchments, and is monitoring water quality and estuary health in 6 bushfire impacted estuaries. Council developed the South-East Catchments and Waterways Bushfire Recovery Plan in conjunction with Shoalhaven and Bega Valley councils to help guide these restoration efforts and reduce impacts to waterways in the medium to long term. These projects are supported by funding from the NSW Government's Bushfire Affected Coastal Waterways – Coastal and Estuary Grants Program.

Following the adoption of the revised Integrated Water Cycle Management Strategy in 2016, council has continued to invest in its capital works program throughout 2021–2022 to meet the objectives of providing improved water supply and sewerage services to all villages by 2036. Ongoing maintenance and upgrades of the sewerage reticulation network will improve the capacity and performance of the system, and reduces the occurrence of sewage discharges to the environment.

Works recently completed include:

- major capacity upgrades to the Potato Point sewerage scheme and at Tuross WWTP in 2022
- upgrade to the capacity of the Tomakin sewer system, which included the construction of a new regional sewage pump station at Broulee in 2021

- upgrades and new sewer pump stations in Batehaven, Batemans Bay and Surf Beach catchments to increase storage capacity and reliability of the pump stations, reducing potential sewage discharges to waterways.

Malua Bay Beach
Photo: Beachwatch/DPE

Major works currently underway include:

- design of Nelligen sewerage scheme and Tomakin WWTP upgrade, with construction to commence in 2022–2023
- major capacity upgrade at Batemans Bay WWTP due for completion by June 2023
- upgrades to 2 sewage pump stations at Tuross Heads is underway with construction to commence in early 2023.

Sewage pump station pumps continued to be serviced and replaced as necessary throughout the Eurobodalla region. The relining and replacement of sewer mains, as well as CCTV inspections and cleaning of sewer mains have also been completed during 2021–2022.

Sampling sites and Beach Suitability Grades in Eurobodalla Shire Council

Cookies Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Cookies Beach is located near the town of South Durras. Murramarang National Park lies to the south.

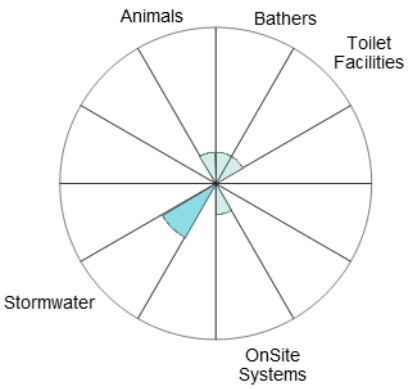
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few significant sources of faecal contamination.

Enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit after 20 mm or more of rain

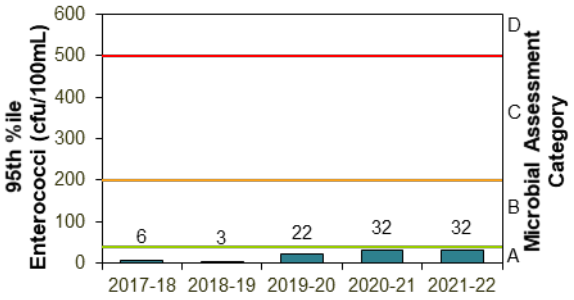
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	96%	100	Stable

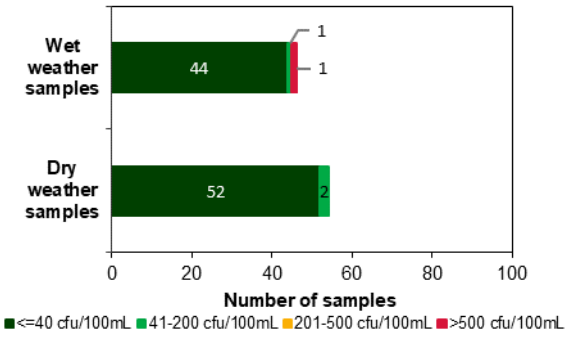
Sanitary inspection: Low



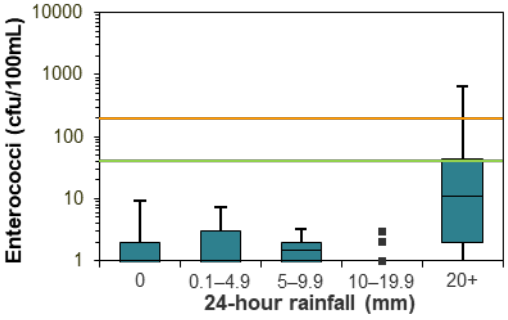
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Caseys Beach

Beach grade: P

See ‘How to read this report’ for key to map.

Caseys Beach is approximately 800 m long and is located to the south of Observation Point.

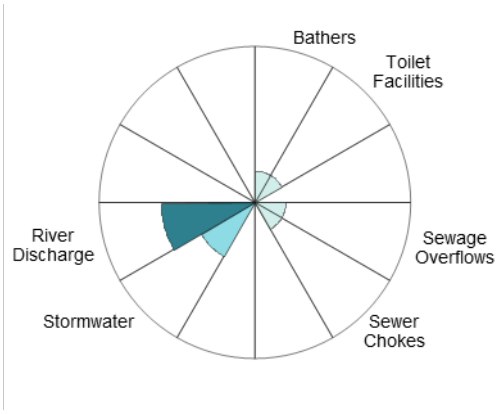
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with several potential sources of faecal contamination including stormwater and other sources within Batemans Bay.

Enterococci levels generally increased with increasing rainfall, occasionally exceeding the safe swimming limit in response to little or no rain, and often after 20 mm or more.

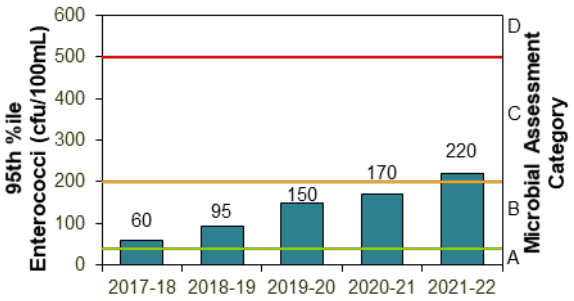
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	87%	100	Declined ↓

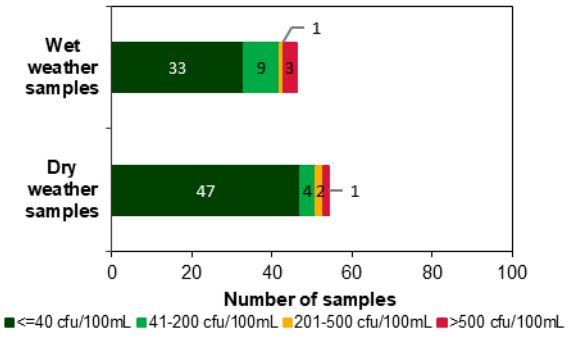
Sanitary inspection: Moderate



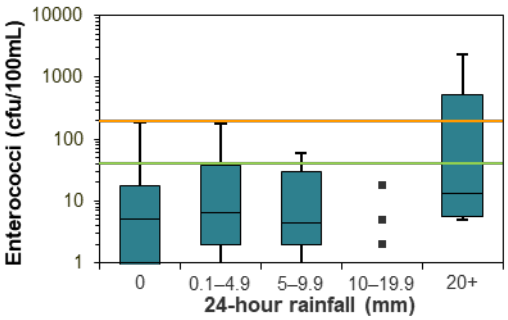
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Surf Beach

Beach grade: P

See ‘How to read this report’ for key to map.

Surf Beach is a popular beach approximately 350 m long and is patrolled in the warmer months.

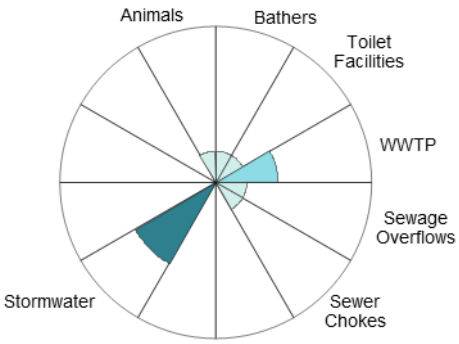
The Beach Suitability Grade of Poor indicates microbial water quality is susceptible to faecal pollution, particularly after rainfall and occasionally during dry weather conditions, with potential faecal contamination from stormwater.

Enterococci levels increased with increasing rainfall, often exceeding the safe swimming limit after little or no rain, and regularly after 20 mm or more.

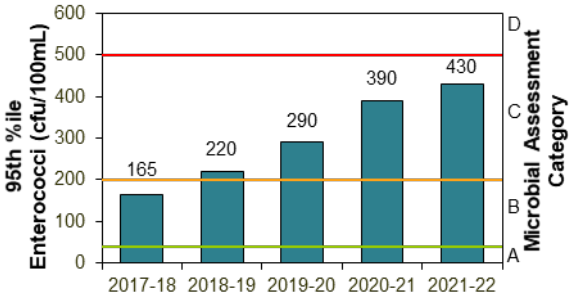
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	67%	100	Stable

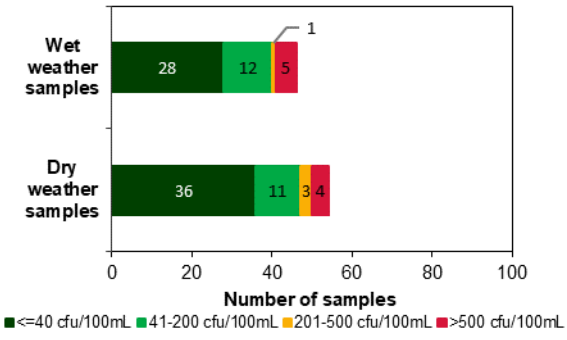
Sanitary inspection: Moderate



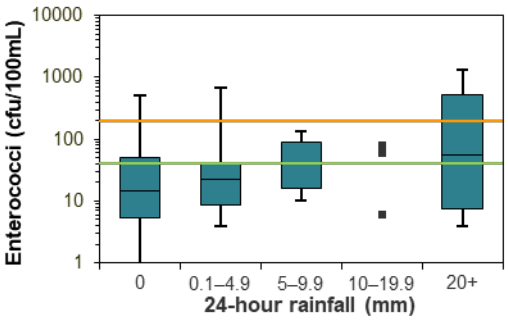
Microbial Assessment Category: C



Dry and wet weather water quality



Water quality in response to rainfall



Malua Bay Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Malua Bay Beach is approximately 500 m long and is patrolled during the warmer months.

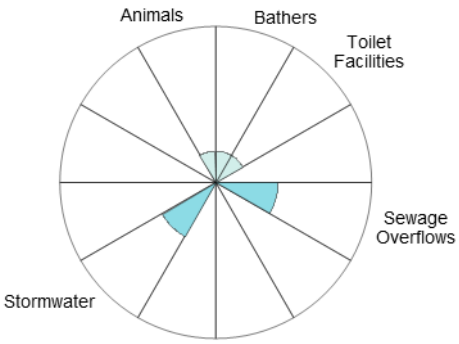
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased slightly with increasing rainfall, regularly exceeding the safe swimming limit in response to 20 mm or more of rain.

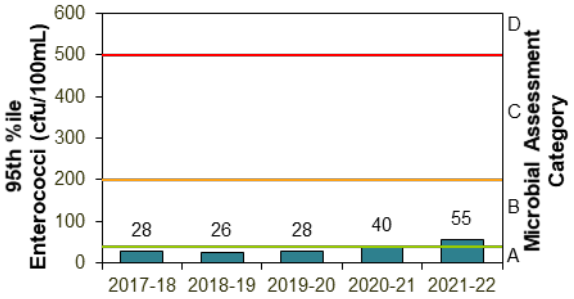
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	100%	100	Declined ↓

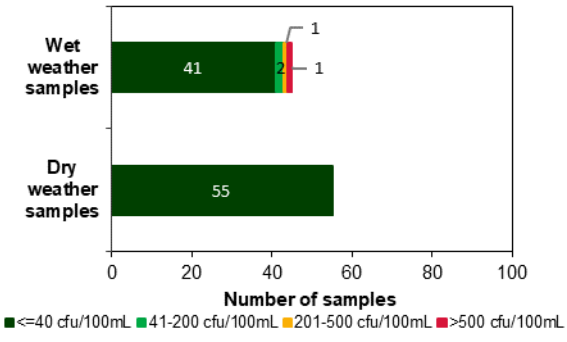
Sanitary inspection: Low



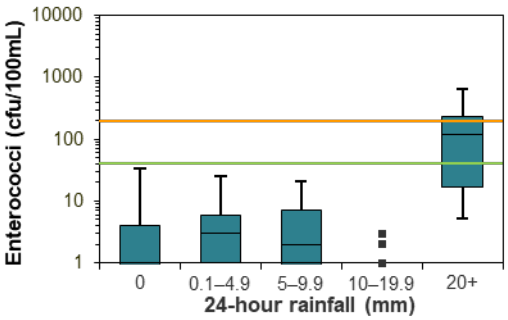
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Broulee Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Broulee Beach extends from Candlagan Creek in the north to Broulee Island in the south.

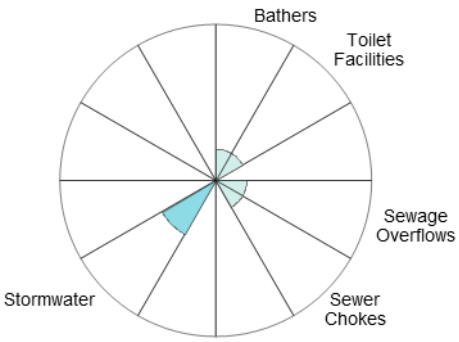
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of minor faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 5 mm or more of rain, and often after 10 mm or more.

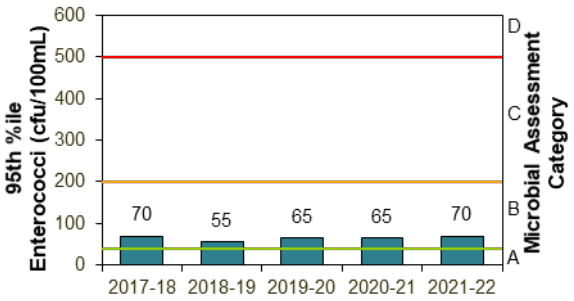
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	95%	100	Stable

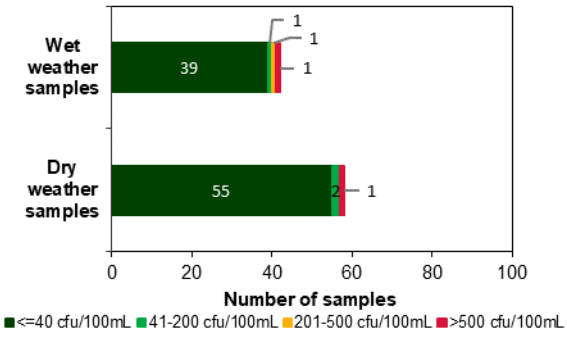
Sanitary inspection: Low



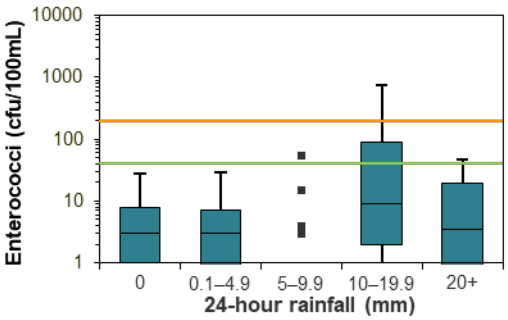
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



South Broulee (Bengello) Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Bengello Beach extends from Broulee Head to the mouth of the Moruya River. The beach is patrolled during the summer months.

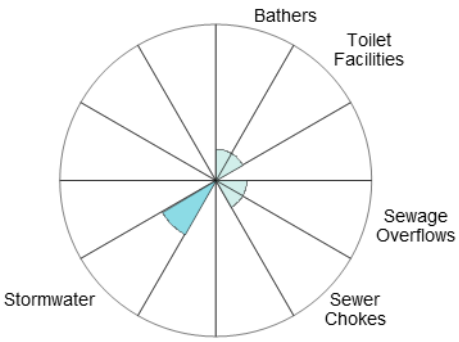
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 10 mm or more.

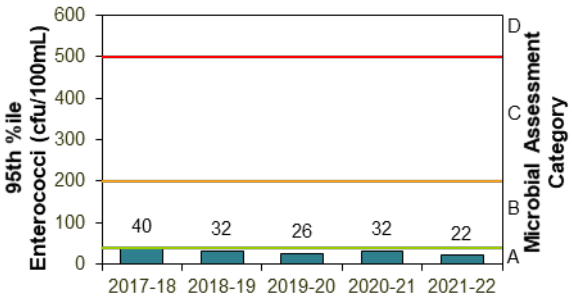
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	95%	100	Stable

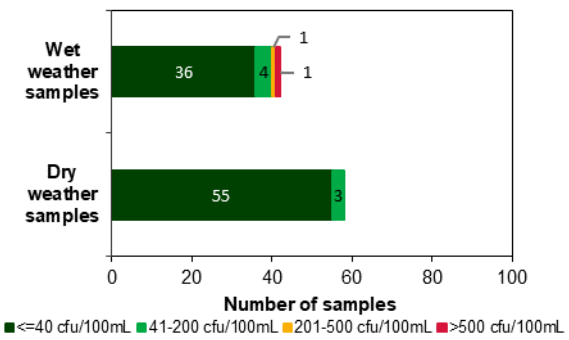
Sanitary inspection: Low



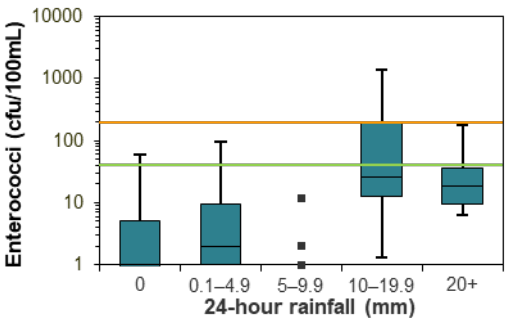
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Shelley Beach

Beach grade: G

See 'How to read this report' for key to map.

Shelley Beach is located near the mouth of the Moruya River and backed by Eurobodalla National Park.

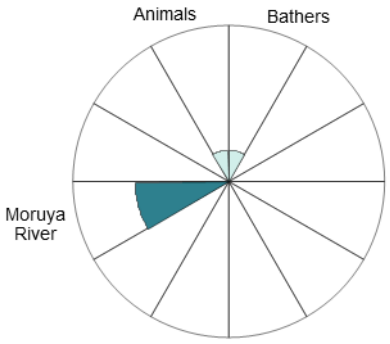
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream river sources.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to no rain and after rainfall.

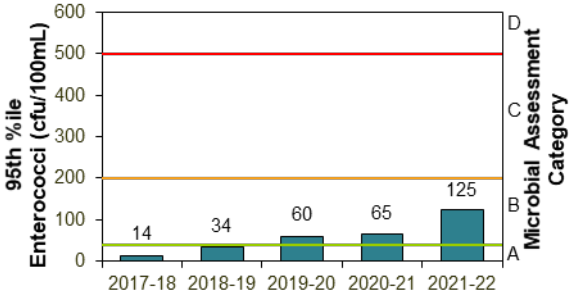
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	90%	100	Stable

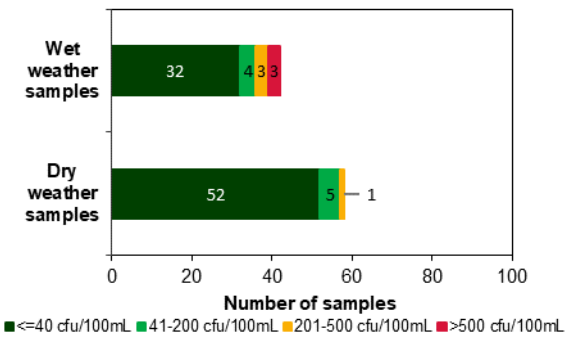
Sanitary inspection: Moderate



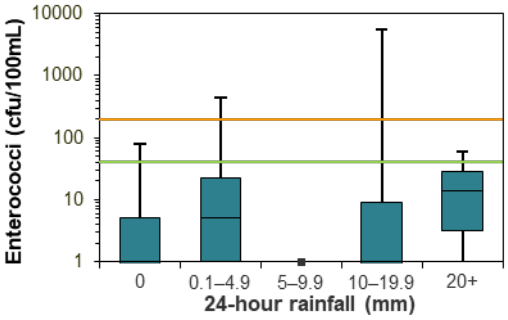
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Tuross Main Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Tuross Main Beach is a 250 m long beach located between Tuross Headland in the north and Tuross Lake in the south.

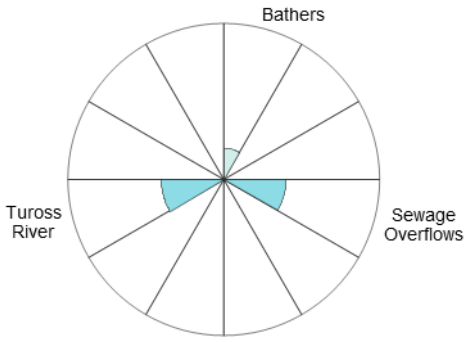
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but can be susceptible to pollution after rain, with several potential sources of faecal contamination including upstream river sources.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit in response to no rain and after rainfall.

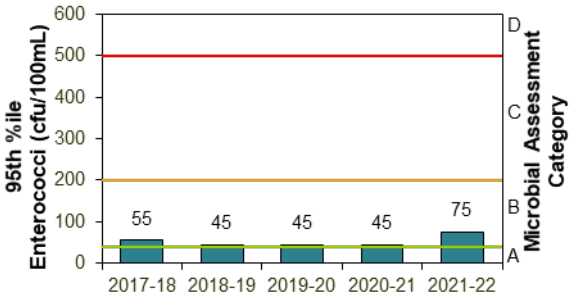
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	95%	100	Stable

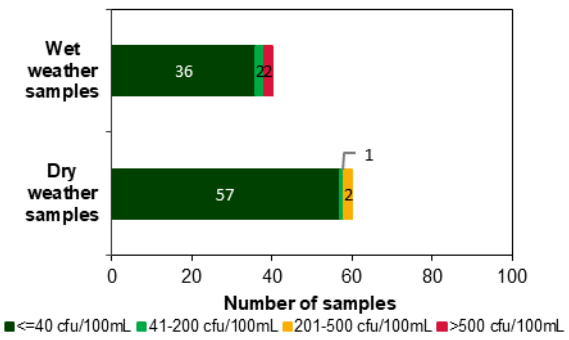
Sanitary inspection: Low



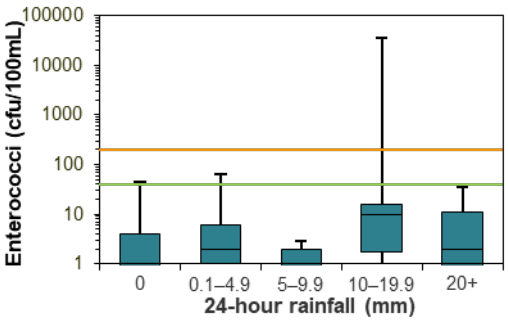
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Brou Beach

Beach grade: VG

See ‘How to read this report’ for key to map.

Brou Beach is located to the north of Dalmeny. The beach is approximately 6.5 km long and is backed by Eurobodalla National Park.

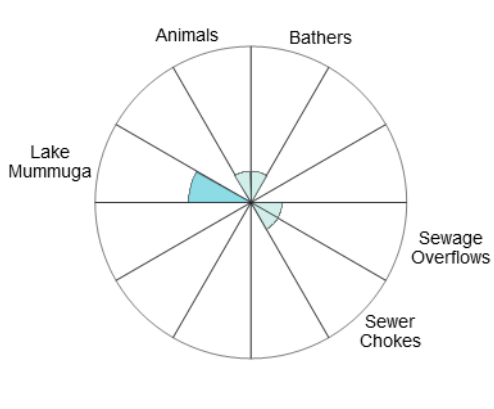
The Beach Suitability Grade of Very Good indicates microbial water quality is considered suitable for swimming almost all of the time, with few potential sources of significant faecal contamination.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after 10 mm or more of rain, and often after 20 mm or more.

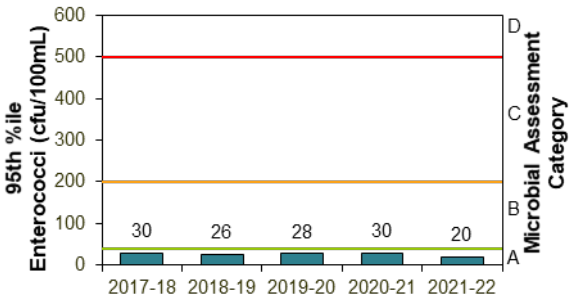
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	100%	100	Stable

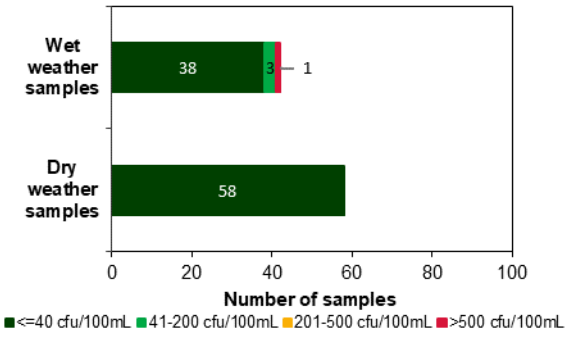
Sanitary inspection: Low



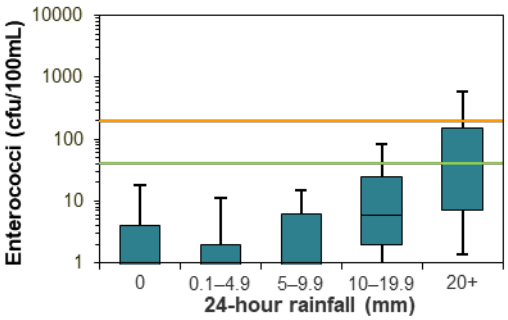
Microbial Assessment Category: A



Dry and wet weather water quality



Water quality in response to rainfall



Wagonga Inlet

Beach grade: G

See ‘How to read this report’ for key to map.

The swimming site is a netted enclosure at the mouth of Wagonga Inlet. The town of Narooma is located on the southern side of the inlet.

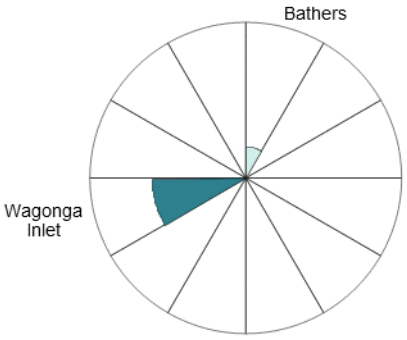
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with potential faecal contamination from upstream sources in Wagonga Inlet.

Enterococci levels increased slightly with increasing rainfall, occasionally exceeding the safe swimming limit after little or no rain, and often after 10 mm or more.

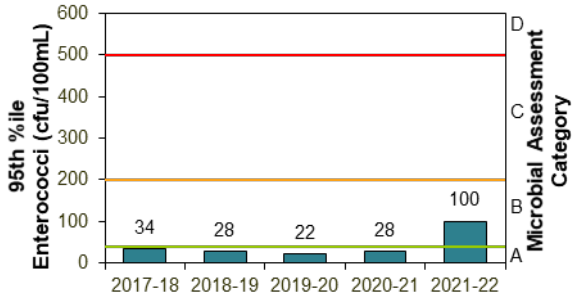
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Estuarine	Nov 2018 to Mar 2022	93%	100	Stable

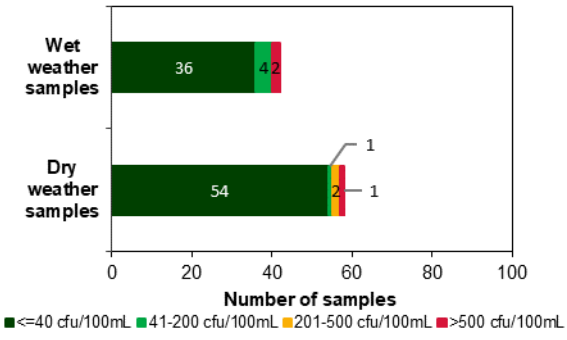
Sanitary inspection: Moderate



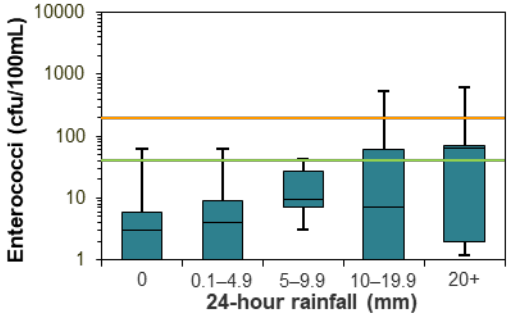
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



Narooma Main Beach

Beach grade: G

See ‘How to read this report’ for key to map.

Narooma Beach is approximately 750 m long and is patrolled on weekends and holidays during the summer months.

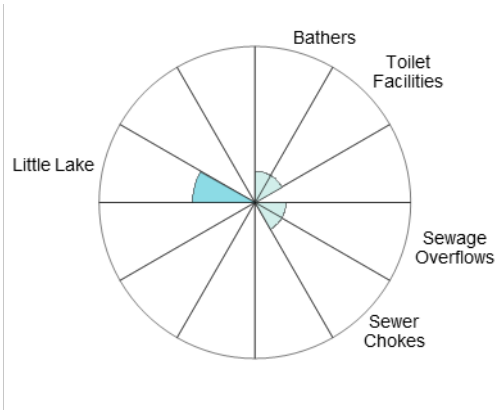
The Beach Suitability Grade of Good indicates microbial water quality is considered suitable for swimming most of the time but may be susceptible to pollution after rain, with potential sources of faecal contamination including outflow from Little Lake.

Enterococci levels increased slightly with increasing rainfall, often exceeding the safe swimming limit after 10 mm or more of rain.

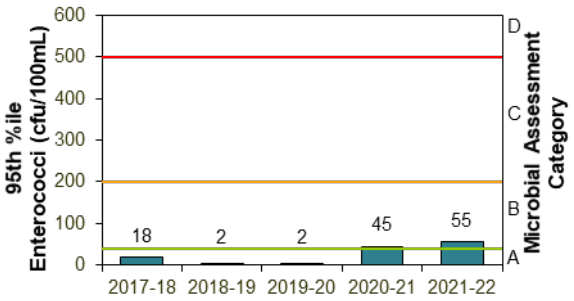
The site has been monitored since 2002.

Site type	Assessment period	Dry weather samples suitable for swimming	Water samples	Beach grade status
Ocean beach	Nov 2018 to Mar 2022	98%	100	Stable

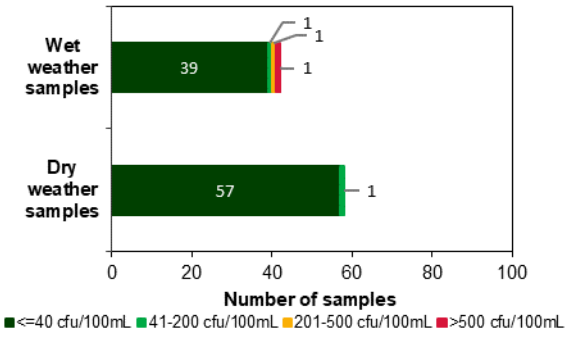
Sanitary inspection: Low



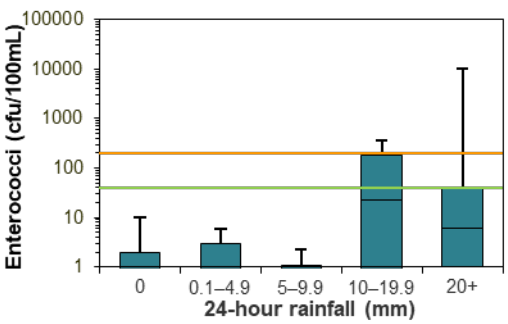
Microbial Assessment Category: B



Dry and wet weather water quality



Water quality in response to rainfall



How to read this report

Beach Suitability Grades

Beach Suitability Grades provide an assessment of the suitability of a swimming location for recreation over time and are based on a combination of sanitary inspection (identification and rating of potential pollution sources at a beach) and microbial assessment (water quality measurements gathered over previous years). There are 5 grades ranging from Very Good to Very Poor:

VG Very Good

Location has generally excellent microbial water quality and very few potential sources of faecal pollution. Water is considered suitable for swimming almost all of the time

G Good

Location has generally good microbial water quality and water is considered suitable for swimming most of the time. Swimming should be avoided during and for up to one day following heavy rain at ocean beaches and up to 3 days at estuarine sites

F Fair

Microbial water quality is generally suitable for swimming, but because of the presence of significant sources of faecal contamination, extra care should be taken to avoid swimming during and for up to 3 days following rainfall or if there are signs of pollution such as discoloured water or odour or debris in the water

P Poor

Location is susceptible to faecal pollution and microbial water quality is not always suitable for swimming. During dry weather conditions, ensure that the swimming location is free of signs of pollution, such as discoloured water, odour or debris in the water, and avoid swimming at all times during and for up to 3 days following rainfall

VP Very Poor

Location is very susceptible to faecal pollution and microbial water quality may often be unsuitable for swimming. It is generally recommended to avoid swimming at these sites almost all of the time

Some of the Beach Suitability Grades in this report are **provisional**, as the information required for the analysis is incomplete due to limited bacterial data or limited information on potential pollution sources in a beach catchment.

The guidelines

The National Health and Medical Research Council's guidelines for managing risks in recreational water (NHMRC 2008) were adopted for use in NSW in May 2009. These guidelines have been adopted in all Australian states and territories and are supported by guidance notes developed by the Department of Health Western Australia (WA Department of Health 2007).

Enterococci

The national guidelines advocate the use of enterococci as the single preferred faecal indicator in marine waters.

These bacteria are excreted in faeces and are rarely present in unpolluted waters. Enterococci have shown a clear dose–response relationship to disease outcomes in marine waters in the northern hemisphere. In accordance with the guidelines, Beachwatch tests for enterococci only. The enterococci density in water samples is analysed in the laboratory using method AS/NZS 4276.9:2007 (Standards Australia 2007).

Enterococci are measured in colony forming units per 100 mL of sample (cfu/100 mL).

Beach Suitability Grades are determined by using the following matrix:

		Microbial Assessment Category			
		A	B	C	D
Sanitary Inspection Category	Very Low	Very Good	Very Good	Follow Up	Follow Up
	Low	Very Good	Good	Follow Up	Follow Up
	Moderate	Good	Good	Poor	Poor
	High	Good	Fair	Poor	Very Poor
	Very High	Follow Up	Fair	Poor	Very Poor

Using the Beach Suitability Grade classification matrix, sites assigned a moderate Sanitary Inspection Category can only be rated as Good or Poor, with no option of Fair grades. This can create the impression of a large change in water quality when in fact there need only be a slight increase in bacterial counts to push it over the threshold, with no significant increase in the risk to public health.

Microbial Assessment Category (MAC)

There are 4 Microbial Assessment Categories (A to D) and these are determined from the 95th percentile of an enterococci dataset of at least 100 data points. Each MAC is associated with a risk of illness determined from epidemiological studies. The risks of illness shown below are not those associated with a single data point but are the overall risk of illness associated with an enterococci dataset with that 95th percentile (Wyer et al. 1999).

Risk of illness associated with Microbial Assessment Categories

Category	Enterococci (cfu/100 mL)	Illness risk*
A	≤40	GI illness risk: <1% AFR illness risk: <0.3%
B	41–200	GI illness risk: 1–5% AFR illness risk: 0.3–1.9%
C	201–500	GI illness risk: >5–10% AFR illness risk: >1.9–3.9%
D	>500	GI illness risk: >10% AFR illness risk: >3.9%

* GI = gastrointestinal illness; AFR = acute fever and rash

Calculating the MAC

The 95th percentile is a useful statistic for summarising the distribution of enterococci data at a site. It embodies elements of both the location of the distribution (how high/low the enterococci counts are) and the scale of the distribution (how variable the enterococci counts are).

The 95th percentile values for each of the 4 Microbial Assessment Categories were determined by the World Health Organization using enterococci data collected from swimming locations across Europe. These values will represent different probabilities of illness if the distribution of enterococci data from swimming locations in NSW differs from the European distribution.

In recognition of this issue, Dr Richard Lugg (Department of Health, Western Australia) has developed a Microsoft® Excel tool for calculating a modified 95th percentile that takes into account the distribution of data. This tool has been used to calculate the 95th percentile values presented in this report and has been adopted for use by other state governments in Australia.

The tool can be downloaded from the WA Government's 'Environmental waters publications' webpage, under *Forms and templates*.

Sanitary Inspection Category (SIC)

More information about the **sanitary inspection** process is available on the DPE 'Sanitary inspection of beaches' webpage.

The aim of a sanitary inspection is to identify all sources of faecal contamination that could affect a swimming location and assess the risk to public health posed by these sources. It is an assessment of the likelihood of bacterial contamination from identified pollution sources and should, to some degree, correlate with the bacterial water quality results obtained from sampling.

The main sources of faecal contamination considered in the sanitary inspection are: bathers, toilet facilities, WWTPs, sewage overflows, sewer chokes, onsite systems, wastewater re-use, stormwater, river discharge, lagoons, boats and animals.

Rivers, lakes and estuaries themselves can be potential sources of faecal contamination to sites located in these waterbodies, with contaminated water from upstream or surrounding areas impacting water quality at the swimming location. This source is captured in river discharge or lagoon category, and shown as the waterbody in the sanitary inspection charts.

Through the sanitary inspection process, beaches are categorised to reflect the overall likelihood of faecal contamination. There are 5 categories: Very Low, Low, Moderate, High and Very High.

Stormwater drain flow
Photo: Beachwatch/DPE

Stormwater in urban areas often contains sewage from leakages, overflows or sewer chokes when the sewerage system fails.

Sewage overflows can occur in wet weather when the network has exceeded capacity due to rainwater entering the system. The mix of sewage and rainwater discharges from designated overflow points and drains to waterways, usually via the stormwater system. Overflows from the sewerage system can also occur in dry weather due to mechanical failure or power outage.

Sewer chokes occur due to blockages in the pipes usually due to tree roots, oil, grease or debris. This causes sewage to back up and escape via sewer inspection points, designed overflow structures or cracks in the pipes, then drain to waterways, usually via the stormwater system.

Explanation of tables

Each region contains tables listing all monitored swimming sites including site type, beach grade and change in grade from the previous year.

The following symbols are used to show the change in beach grade from the previous year:

Stable

Improved

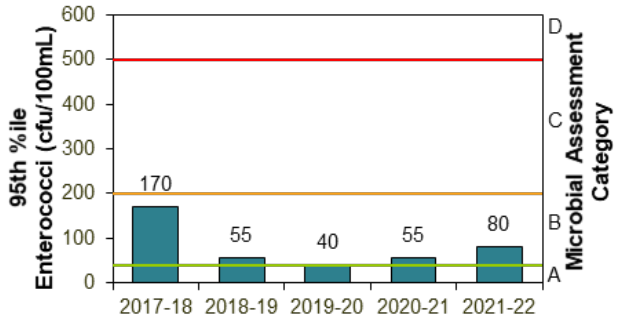
Declined

A provisional grade indicates the assessment is based on limited data collected during the assessment period and should not be compared to the beach grade from the previous year.

Explanation of graphs, charts, and information bars on beach pages

Microbial Assessment Category (MAC) chart

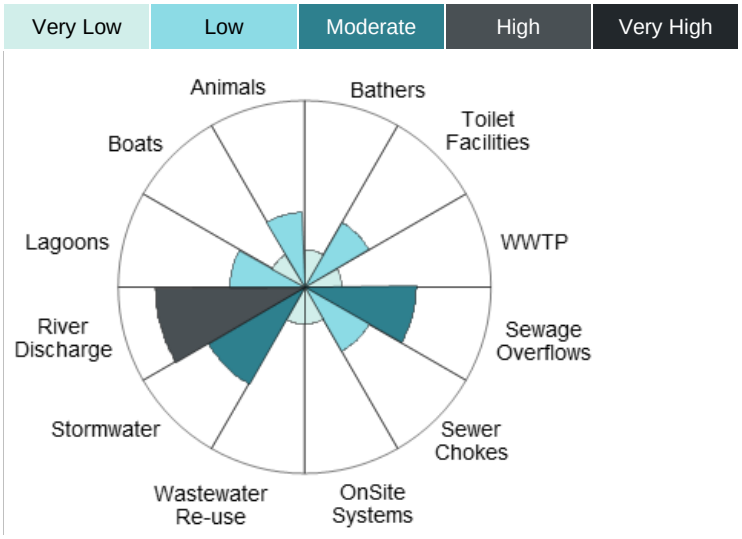
On each beach page, the MACs for the last 5 years are displayed on a simple bar chart. The MAC for the current year is based on enterococci data collected during the assessment period. The bars are labelled with the 95th percentile value for each year and the thresholds dividing the A, B, C and D categories are marked in green, amber and red for reference.



Sanitary Inspection Category (SIC) chart

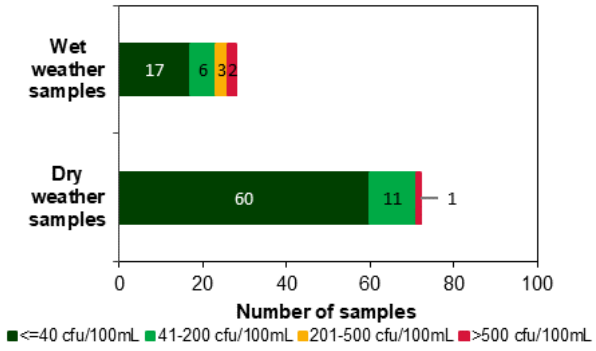
The results of the sanitary inspection for each swimming location are presented in a radar pie chart. The chart shows the likelihood that each identified pollution source will contribute to faecal contamination at a swimming site, as indicated by the size and colour of the segment, ranging from

very low (lightest colour) to very high (darkest colour) as shown below. The sum of these contributions is the overall likelihood, or Sanitary Inspection Category.



Wet and dry weather water quality chart

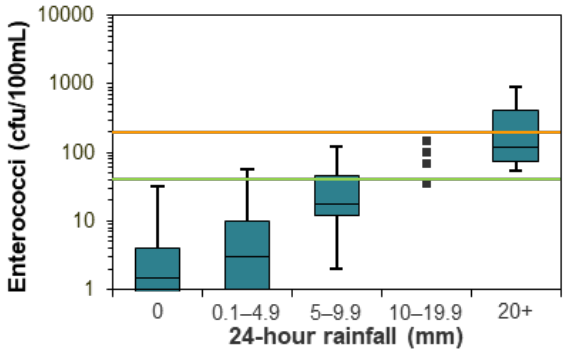
Enterococci levels in wet and dry weather conditions are presented for each swimming location as a bar graph. All data collected during the assessment period is included in the analysis. Dry weather is defined as no rainfall recorded in the previous 24 hours. Each bar is colour coded to show the number of enterococci results up to 40 cfu/100 mL, between 41 and 200 cfu/100 mL, between 201 and 500 cfu/100 mL and greater than 500 cfu/100 mL. These categories reflect the Microbial Assessment Category thresholds and are coloured on the graph as dark green, light green, amber and red respectively.



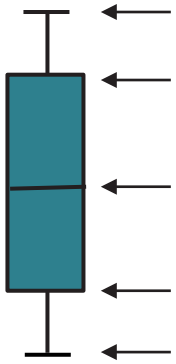
It is expected that swimming sites with lower levels of flushing will show some elevated bacterial results in dry weather samples (no rainfall in the previous 24 hours) due to the longer time needed to recover from a rainfall event. At some estuarine and lake/lagoon swimming locations the impacts of stormwater pollution on beach water quality may be detected up to 3 days after rainfall.

Water quality in response to rainfall

Trends in enterococci levels in response to rainfall are shown using a box plot. For reference, enterococci levels of 40 cfu/100 mL and 200 cfu/100 mL are indicated with a green and orange line, respectively. The 40 cfu/100 mL level is referred to as the ‘safe swimming limit’. The enterococci data were obtained from the last 5 years of monitoring. Rainfall data were obtained from rain gauges situated close to the sample site and are 24-hour totals to 9am on the day of sampling. If there are fewer than 5 enterococci data points in a rainfall category, individual data points are presented instead of a box plot. At sites where many results are below the detection limit (1 cfu/100 mL), only the upper portion of the box plots will be visible.



Each part of the box plot represents a significant percentile value of the sample population:



95% of the samples lie below the top whisker

75% of the samples lie below the top of the box

half the samples are on each side of the middle line of the box (median or 50%ile)

25% of the samples lie below the bottom of the box

5% of the samples lie below the bottom whisker.

Information bars

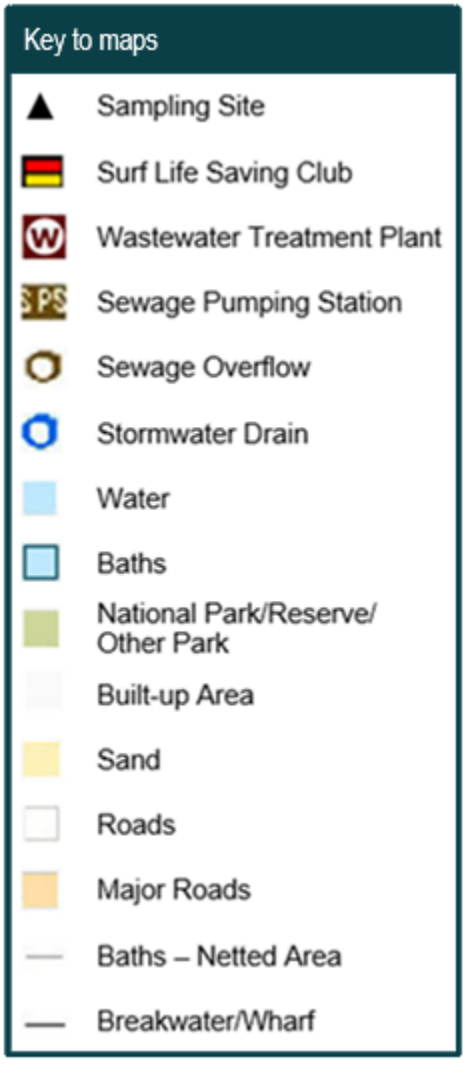
Information bars on each beach page provide a summary of details about the swimming site.

The **assessment period** shows the timeframe in which the water samples were collected. The NHMRC guidelines state beach grades should be determined from the most recent 100 water quality results collected within a 5-year period. The assessment period varies between sites depending on sampling frequency.

Dry weather samples suitable for swimming (**dry weather swimmability**) shows the percentage of water samples with enterococci levels below 40 cfu/100 mL. Dry weather is defined as no rainfall in the previous 24 hours. Swimming sites with lower levels of flushing often have a lower percentage of dry weather samples within the safe swimming limit due to the impacts of rainfall detected up to 3 days after the event.

Explanation of maps

A map of individual swimming locations is presented on each beach page. The scale of the maps is 1:10,000. Each map shows the location of the sampling site, land use and features such as surf lifesaving clubs. Potential pollution sources such as stormwater drains, sewage pumping stations, wastewater treatment plants, lagoons, rivers and creeks, are shown where accurate data is held.



References

NHMRC (2008) *Guidelines for managing risks in recreational water*, National Health and Medical Research Council, Australian Government Publishing Service, Canberra, ACT.

Standards Australia (2007) *AS/NZS 4276.9:2007, Water microbiology Method 9: Enterococci – Membrane filtration method (ISO 7899-2:2000, MOD)*, Standards Australia International Ltd, Sydney and Standards New Zealand, Wellington.

WA Department of Health (2007), *Microbial quality of recreational water guidance notes in support of chapter 5 of the National Health and Medical Research Council guidelines for managing risks in recreational water, 2006*, Department of Health, Western Australia and The University of Western Australia, October 2007, ww2.health.wa.gov.au/Articles/A_E/Environmental-waters-publications, accessed 23/06/22.

Wyer MD, Kay D, Fleisher JM, Salmon RL, Jones F, Godfree AF, Jackson G and Rogers A (1999) 'An experimental health related classification for marine waters', *Water Research*, 33(3):715–722.

More information

- Beachwatch NSW on Twitter
- Beachwatch NSW on Facebook
- Beachwatch webpage
- Coastal management program progress
- Sanitary inspection of beaches
- Subscribe to environment and heritage newsletters
- WA Government environmental water publications