

# Chapter 4

## The Harbourwatch Program

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### Background

The Harbourwatch Program was established in November 1994 to monitor and report on water quality in the harbour, bay and estuarine swimming areas of Sydney. A pilot Harbour Beaches Monitoring Program was conducted by Beachwatch from May 1992 to July 1993.

### Water quality monitoring and reporting

The Harbourwatch Program monitors and reports on water quality at 59 swimming sites within nine catchment areas: Pittwater, Port Jackson, North Harbour, Middle Harbour, lower Lane Cove River, lower Parramatta River, lower Georges River, Botany Bay and Port Hacking.

In addition, Darling Harbour is monitored as part of the Harbourwatch program, even though it is not a swimming site. However, some authorised water-related activities such as water skiing are held there and thus involve primary contact recreation. Darling Harbour is reported on in Chapter 6: Special Studies.

The Harbourwatch daily reporting program uses rainfall data and sewage overflow information for daily assessment of harbour beaches and swimming enclosures. Monthly reports are based on bacterial water quality.

### Sample collection

Beachwatch staff collect water samples at all sites approximately every sixth day in accordance with NHMRC (1990) guidelines for recreational use of water. All samples are transported to one laboratory for microbiological analysis.

### Chapter structure

The results of the Harbourwatch bacterial sampling program are presented in this chapter. So that the characteristics of each beach and the nature of pollution sources can be readily understood, the format of this Chapter is geographically based and collates relevant information on catchment and swimming site pages.

### *Catchment reports*

The catchment pages give an overview of results for all monitored sites within the catchment area and are presented as tables of compliance. Bacterial results for each site within the catchment for summer 2008–2009 are presented graphically as box plots, with the current season's results shaded in grey for ease of identification and for comparison with other sites and catchment areas.

### *Beach reports*

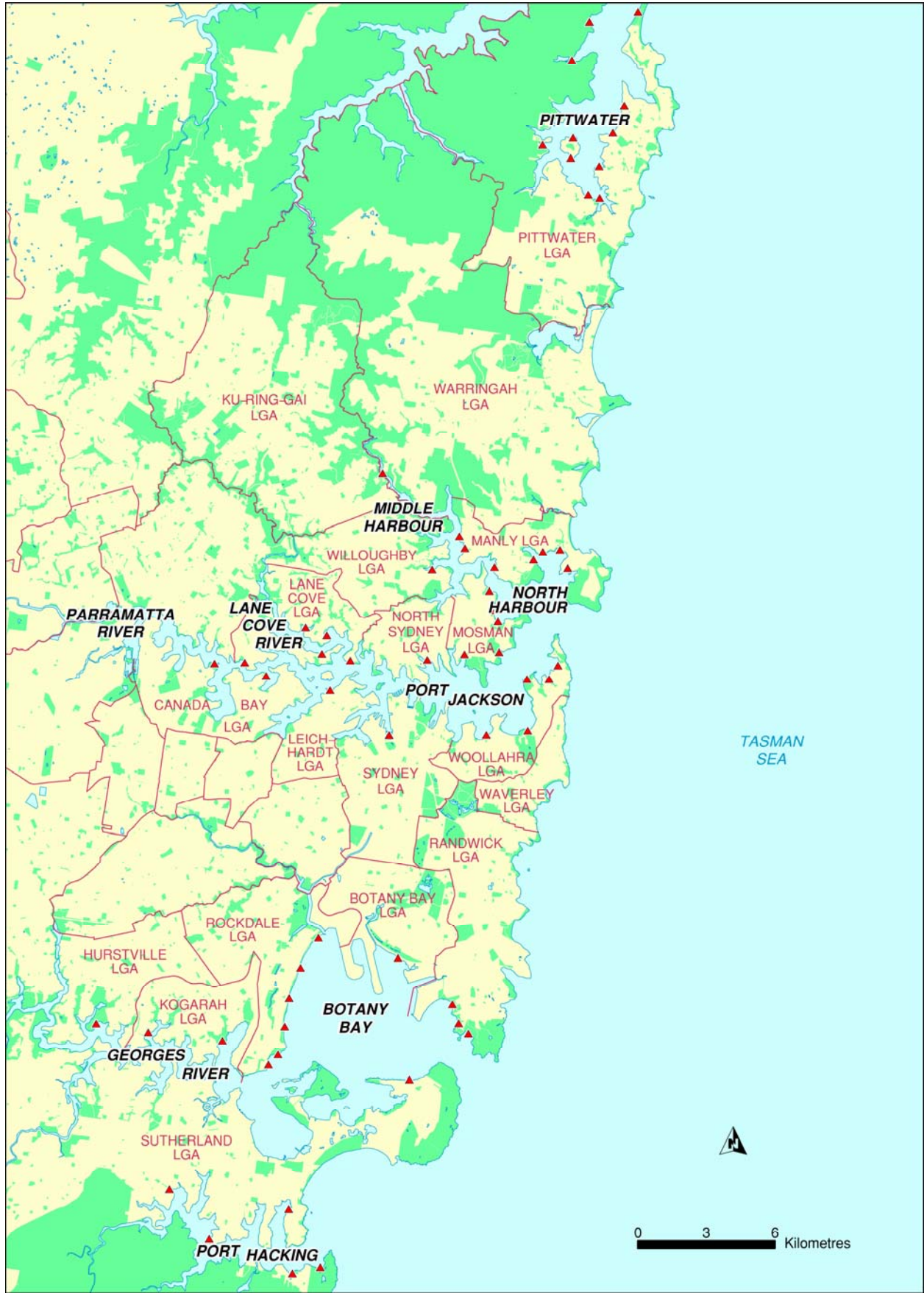
The beach pages give a brief description of the site, an assessment of water quality over the season, any pollution sources that can affect the site and any pollution reduction actions taking place in recent years. Water quality data are presented in three sections:

- an assessment of the level of compliance over the last five years
- the effect of rainfall on bacterial densities using aggregated data from the last three years (including winter season data).
- individual results, rainfall, and the rolling compliance with water quality criteria. These are presented as time-series plots, giving an overview of water quality throughout summer 2008–2009 and the preceding winter season (2008).

### Availability of Harbourwatch results

Besides the results presented in this report, Harbourwatch information can also be accessed via the Beachwatch and Harbourwatch telephone information line (1800 036 677) and the Beachwatch website ([www.environment.nsw.gov.au/beach](http://www.environment.nsw.gov.au/beach)). Historical water quality data, monthly compliances and seasonal compliances can be obtained by contacting Beachwatch Programs directly by email at [beachwatch@environment.nsw.gov.au](mailto:beachwatch@environment.nsw.gov.au), or by phone on (02) 9995 5344 or by downloading from the Beachwatch website.

# Sydney Metropolitan Area Harbour Swimming Sites



## Summary

Forty-one of the 59 harbour swimming sites complied 100% with Beachwatch criteria for faecal coliforms and enterococci during the 2008–2009 summer season (Figure 20 and Figure 21). These results are among the best ever recorded, just behind summer 2006–2007, when 43 harbour beaches complied 100%, and summer 2005–2006, when 51 harbour beaches complied 100%.

Results for summer 2008–2009 were a vast improvement on summer 2007–2008, when extreme wet weather conditions resulted in only ten harbour swimming sites complying 100%.

With a return to average rainfall in summer 2008–2009, improvements in water quality were recorded at 47 swimming sites.

Compliance increased for one or both indicators at:

- Salt Pan Cove Baths, Winji Jimmi Bay, South Scotland Island and Elvina Bay in Pittwater
- Little Sirius Cove, Clifton Gardens, Redleaf Pool, Rose Bay Beach, Parsley Bay, Watsons Bay, Forty Baskets Pool, Manly Cove, Little Manly Cove, Davidson Reserve, Gurney Crescent Baths, Sangrado Baths, Northbridge Baths, Clontarf Pool, Chinamans Beach, Edwards Beach, Balmoral Baths, Tambourine Bay, Woodford Bay, Woolwich Baths, Cabarita Beach, Henley Baths, Chiswick Baths, Dawn Fraser Pool and Greenwich Baths in Sydney Harbour
- Jew Fish Bay Baths, Como Baths, Oatley Bay Baths, Carss Point Baths, Sandringham Baths and Dolls Point Baths in Lower Georges River.
- Ramsgate Baths, Monterey Baths, Brighton-le-Sands Baths, Kyeemagh Baths, Yarra Bay, Frenchmans Bay, Congwong Bay and Silver Beach in Botany Bay
- Gunnamatta Bay Baths, Lilli Pilli Baths, Gynea Bay Baths and Horderns Beach in Port Hacking.

Decreases in water quality over the 2008–2009 summer season were recorded at six swimming sites. Compliance decreased for one or both indicators at:

- Bayview Baths in Pittwater
- Hayes Street Beach and Redleaf Pool, in Sydney Harbour
- Jew Fish Bay Baths and Oatley Bay Baths, in lower Georges River
- Brighton-le-Sands Baths in Botany Bay.

## Cleanest harbour swimming sites

Harbour swimming sites that complied 100% of the time with both bacterial indicators during summer 2008–2009 were:

- **Pittwater** – Barrenjoey Beach, Paradise Beach Baths, Clareville Beach, Salt Pan Cove Baths, Winji Jimmi Bay, North Scotland Island, South Scotland Island, Elvina Bay, The Basin and Great Mackerel Beach.
- **Sydney Harbour** – Little Sirius Cove, Clifton Gardens, Rose Bay Beach, Nielsen Park, Parsley Bay, Watsons Bay, Forty Baskets Pool, Fairlight Beach, Manly Cove, Little Manly Cove, Gurney Crescent Baths, Northbridge Baths, Clontarf Pool, Chinamans Beach, Edwards Beach, Balmoral Baths, Tambourine Bay, Woodford Bay, Woolwich Baths, Cabarita Beach, Henley Baths, Chiswick Baths, Dawn Fraser Pool and Greenwich Baths.
- **Lower Georges River** – Dolls Point Baths
- **Botany Bay** – Monterey Baths, Congwong Bay and Silver Beach.
- **Port Hacking** – Gunnamatta Bay Baths, Lilli Pilli Baths and Jibbon Beach.

## Pittwater

### *Faecal coliform compliance*

All 11 Pittwater swimming sites complied 100% with Beachwatch criteria for faecal coliforms for summer 2008–2009 (Figure 21). These results are similar to those recorded in the previous summer season.

*Enterococci compliance*

Ten of the 11 Pittwater swimming sites recorded 100% compliance with Beachwatch enterococci criteria during summer 2008–2009. A high level of compliance was also recorded at Bayview Baths (88%), although this result was lower than the previous season.

Significant improvements in enterococci compliance from the previous season were recorded at Salt Pan Cove Baths (19 percentage points), Winji Jimmi Bay (19 percentage points), and both South Scotland Island and Elvina Bay (13 percentage points).

**Port Jackson***Faecal coliform compliance*

Six of the eight swimming sites monitored in Port Jackson recorded 100% compliance with Beachwatch criteria for faecal coliforms (Figure 20).

Faecal coliform compliance improved at Little Sirius Cove by 16 percentage points from the previous summer, while compliance fell at Redleaf Pool (by nine percentage points to 81%) and at Hayes Street Beach (by 23 percentage points to 61%). Water quality at Hayes Street Beach was affected by a number of dry weather sewage overflows that occurred between February and April 2009.

*Enterococci compliance*

Six of the eight Port Jackson swimming sites recorded 100% compliance with Beachwatch criteria for enterococci (Figure 20). High compliance was also recorded at Redleaf Pool (97%). These results are a substantial improvement from the previous summer season when heavy rainfall resulted in only one site complying 100% of the time.

Improvements in enterococci compliance were recorded at Little Sirius Cove (39 percentage points), Rose Bay Beach and Watsons Bay (16 percentage points), Redleaf Pool (ten percentage points) and Clifton Gardens and Parsley Bay (six percentage points) from the previous summer season.

Enterococci compliance at Hayes Street Beach fell by three percentage points from the previous summer season.

**North Harbour***Faecal coliform compliance*

All four North Harbour swimming sites recorded 100% compliance with the faecal coliform criteria (Figure 20).

Improvements in faecal coliform compliance were recorded for Forty Baskets Pool and Little Manly Cove, with both sites increasing six percentage points from the previous summer season.

*Enterococci compliance*

All four North Harbour swimming sites recorded 100% compliance with enterococci guidelines during summer 2008–2009.

Little Manly Cove improved by 16 percentage points and both Forty Baskets Pool and Manly Cove improved by six percentage points from the previous summer.

**Middle Harbour***Faecal coliform compliance*

During summer 2008–2009, six of the eight swimming sites in Middle Harbour recorded faecal coliform compliance of 100%. High faecal coliform compliance was also recorded at Davidson Reserve (97%) and Sangrado Baths (97%) (Figure 20).

Faecal coliform compliance increased substantially from the previous summer season at five locations: Sangrado Baths (42 percentage points), Clontarf Pool (29 percentage points), Davidson Reserve (23 percentage points), Northbridge Baths (19 percentage points) and Gurney Crescent Baths (16 percentage points).

*Enterococci compliance*

Seven of the eight swimming sites in Middle Harbour recorded enterococci compliance of 100% during summer 2008–2009. High faecal coliform compliance was also recorded at Davidson Reserve (97%).

Enterococci compliance improved across all Middle Harbour sites in summer 2008–2009 from the previous summer season.

Enterococci compliance increased at Sangrado Baths (58 percentage points), Davidson Reserve (45 percentage points), Gurney Crescent Baths (32 percentage

points), Clontarf Pool (29 percentage points), Northbridge Baths (26 percentage points), Balmoral Baths (ten percentage points) and Chinamans and Edwards beaches (six percentage points).

### **Lower Lane Cove River**

#### *Faecal coliform compliance*

All three lower Lane Cove River swimming sites recorded 100% compliance with Beachwatch criteria for faecal coliforms during summer 2008–2009 (Figure 20).

Tambourine Bay faecal coliform compliance improved by 26 percentage points, Woolwich Baths improved by 23 percentage points and Woodford Bay improved by three percentage points from the previous summer season.

#### *Enterococci compliance*

All three lower Lane Cove River swimming sites recorded 100% compliance with Beachwatch criteria for enterococci during summer 2008–2009 (Figure 20).

Tambourine Bay, Woodford Bay and Woolwich Baths improved by 39, 23 and 29 percentage points respectively from the previous summer season's enterococci compliance results.

### **Lower Parramatta River**

#### *Faecal coliform compliance*

All five lower Parramatta River swimming sites recorded 100% compliance with faecal coliform criteria during summer 2008–2009 (Figure 20). These results are a substantial improvement from the previous summer season's when no site complied 100% of the time.

Cabarita Beach, Henley Baths, Dawn Fraser Pool and Greenwich Baths all improved by 13 percentage points from summer 2007–2008. Chiswick Baths improved by ten percentage points from the previous summer season.

#### *Enterococci compliance*

All five lower Parramatta River swimming sites recorded 100% compliance with enterococci criteria during summer 2008–2009 (Figure 20).

Enterococci compliance improved across all lower Parramatta River sites in summer 2008–2009 from the previous summer season. Enterococci compliance increased at Cabarita Beach (32 percentage points), Henley and Chiswick Baths (23 percentage points), Dawn Fraser Pool (19 percentage points) and Greenwich Baths (16 percentage points).

### **Lower Georges River**

#### *Faecal coliform compliance*

Two of the six lower Georges River swimming sites recorded 100% compliance with Beachwatch criteria for faecal coliforms during summer 2008–2009 (Figure 21). High compliance was also recorded at Como Baths (97%), Oatley Bay Baths (94%), Sandringham Baths (94%) and Jew Fish Bay Baths (91%).

Improvements in faecal coliform compliance from the previous summer season were recorded across all sites in the lower Georges River. Faecal coliform compliance increased at Carss Point Baths (22 percentage points), Dolls Point Baths (12 percentage points), Como Baths (nine percentage points), Oatley Bay Baths and Sandringham Baths (six percentage points) and Jew Fish Bay Baths (three percentage points) from the previous summer season.

#### *Enterococci compliance*

Dolls Point Baths in the lower Georges River recorded 100% compliance with Beachwatch criteria for enterococci during summer 2008–2009, an improvement of nine percentage points from the previous summer season (Figure 21). Good compliance was also recorded at Sandringham Baths (94%).

Carss Point Baths improved by 29 percentage points from the previous summer season to reach 88% compliance. Como Baths remained at 84% compliance, the same as in the previous season.

Although a fall in compliance (three percentage points) was recorded at Jew Fish Bay Baths, the site still complied well (84%) with enterococci criteria. Lowest compliance (69%) was recorded at Oatley Bay Baths, a fall of three percentage points from the previous summer season.

## Botany Bay

### *Faecal coliform compliance*

Five of the nine Botany Bay swimming sites recorded 100% compliance with Beachwatch faecal coliform criteria (Figure 21). The exceptions were Brighton-le-Sands, Kyeemagh Baths and Frenchmans Bay which also recorded high compliances of 97%, 97% and 91% respectively.

Improvements in faecal coliform compliance were recorded at six sites in Botany Bay. These were Frenchmans Bay (19 percentage points), Kyeemagh Baths and Ramsgate Baths (13 percentage points each), Monterey Baths and Silver Beach (12 percentage points each) and Brighton-le-Sands (nine percentage points).

Access to Foreshores Beach was limited during summer 2008–2009 owing to construction works at the site. As a consequence compliance with faecal coliform criteria could not be calculated because an insufficient number of samples was collected within the required period.

### *Enterococci compliance*

Four of the nine Botany Bay swimming sites recorded 100% compliance with Beachwatch enterococci criteria (Figure 21). High compliance was also recorded at Ramsgate Baths (94%) and Brighton-le-Sands (97%), a decline of six and three percentage points respectively from the previous summer season.

Enterococci compliance improved by nine percentage points at Yarra Bay to 75%, and by 22 percentage points at Frenchmans Bay to 78%, from the previous summer season.

Access to Foreshores Beach was limited during summer 2008–2009 due to construction works at the site. As a consequence compliance with enterococci criteria could not be calculated because an insufficient number of samples was collected within the required period.

## Port Hacking

### *Faecal coliform compliance*

All five Port Hacking swimming sites recorded 100% compliance with Beachwatch faecal coliform criteria during summer 2008–2009 (Figure 21).

Improvements in faecal coliform compliance were recorded at four sites in Port Hacking. These were Gymea Bay Baths (25 percentage points), Gunnamatta Bay Baths (19 percentage points), Lilli Pilli Bay Baths (12 percentage points each) and Horden Beach (nine percentage points).

### *Enterococci compliance*

Three of five swimming sites in Port Hacking recorded 100% compliance with enterococci criteria during summer 2008–2009. Gymea Bay Baths and Horden Beach also recorded good compliance with 94% and 97% respectively.

Improvements in enterococci compliance were recorded at three sites in Port Hacking. These were Gymea Bay Baths, up by 28 percentage points, and Gunnamatta Bay Baths and Hordens Beach, both with an increase of six percentage points.

## Plans for improvement

### *Sewage overflows – SewerFix*

Sydney Water is required by DECCW Environment Protection Licence conditions to manage sewerage treatment systems efficiently, in order to protect and minimise harm to the environment and public health. The licences aim to minimise the frequency and volume of overflows and sewage treatment plant bypasses by identifying limits and targets for sewage overflows as well as measures to require further overflow abatement.

Details on SewerFix, Sydney Water's 20-year program for maintaining and improving the sewer system, are presented in Chapter 2.

### *Stormwater*

From 2006 to 2008 the Environmental Trust provided over \$19.8 million for 26 projects to improve the condition of degraded urban waterways through rehabilitation and restoration activities. Grant funding was made available by the NSW Government's Environmental Trust Urban Sustainability Program, through the Urban Sustainability Major Projects and Urban Waterways Initiative. Grant funding is targeted at local councils working with the community and business to protect and improve the urban environment. Priority catchment areas for

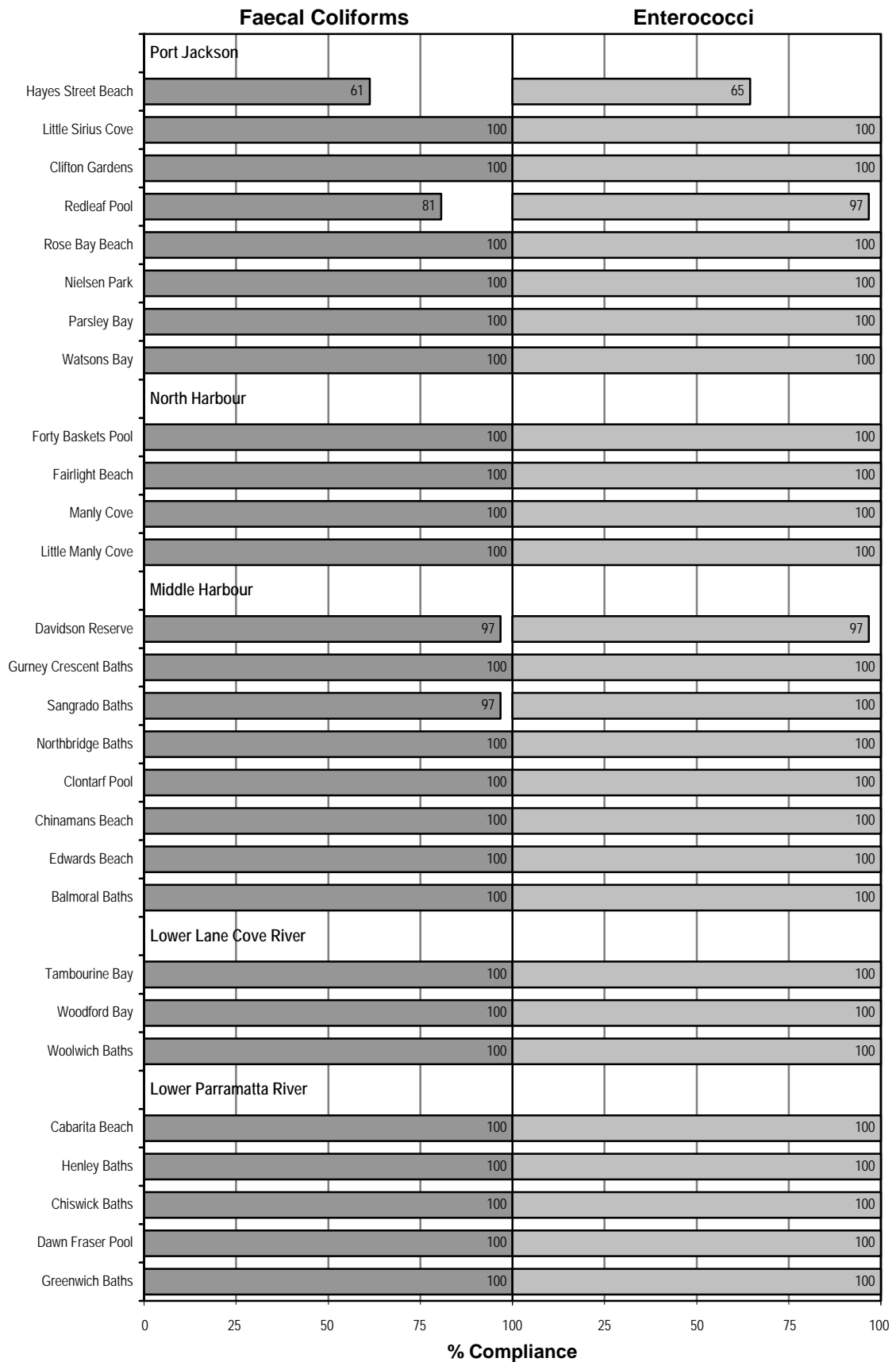
the Urban Waterways funding stream include the Cooks River, Georges River and Sydney Harbour.

The projects implemented include initiatives such as stormwater reuse schemes, water-sensitive urban design, and activities to restore streams and creeks in various local government areas, thus improving local water quality and overall catchment health. These projects have also included the implementation of education and engagement programs to maintain the health of urban catchments.

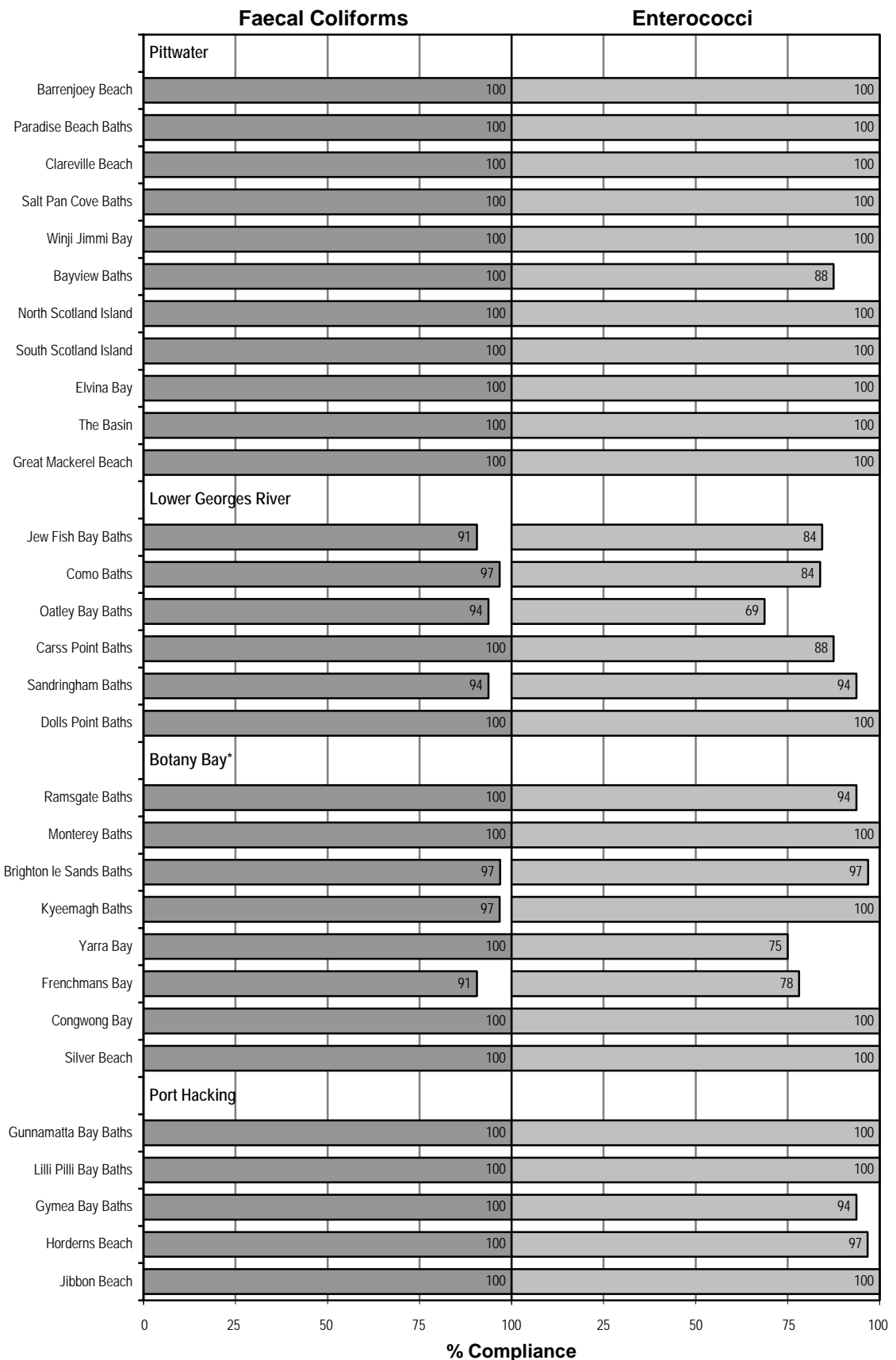
The NSW Government's Urban Stormwater Program was established in 1997 and concluded in 2006. A total of \$82 million in seed funding was provided to address stormwater quality hotspots and to give the stormwater industry and stormwater managers opportunity to develop new ways of addressing poor stormwater quality and ameliorating its impact on receiving waters.

The major outcomes of the NSW Government's Urban Sustainability Program, Diffuse Source Water Pollution Strategy and Urban Stormwater Program, together with details of Sydney Water's investment in stormwater improvement are presented in Chapter 2.

**Figure 20: Compliance of Harbourwatch Sites during Summer 2008–2009:  
Sydney Harbour**



**Figure 21: Compliance of Harbourwatch Sites during Summer 2008–2009:  
Pittwater, Lower Georges River, Botany Bay and Port Hacking**



\* Compliance was not calculated for Foreshores Beach due to limited access during the summer season



# *Sydney Metropolitan Area Harbour Swimming Sites*

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*Pittwater*

# Pittwater

**Sites:** Barrenjoey Beach, Paradise Beach Baths, Clareville Beach, Salt Pan Cove Baths, Winji Jimmi Bay, Bayview Baths, North Scotland Island, South Scotland Island, Elvina Bay, The Basin and Great Mackerel Beach



## Location

The Pittwater catchment covers 49 square kilometres. Land use is mainly residential and bushland (including Ku-ring-gai Chase National Park), with some commercial, light industrial and recreational areas.

Pittwater Council operates in this area.

## Compliance with guidelines

Compliance with swimming guidelines at Pittwater beaches during summer 2008–2009 was excellent, with ten of eleven beaches complying with both bacterial indicators 100% of the time (Table 15). The exception was Bayview Baths, which achieved 100% compliance with faecal coliforms and 88% with enterococci criteria.

The range of indicator bacteria levels measured at Pittwater swimming areas during summer 2008–2009 is shown in Figure 22. Levels of faecal coliforms and enterococci were generally lowest at monitoring sites closest to Broken Bay.

## Ranking of beaches

All monitored harbour and ocean beach swimming locations in the Hunter, Sydney and Illawarra regions were ranked on the basis of their compliance with swimming guidelines during summer 2008–2009. A total of 14 distinct ranks were determined for the 131 sites monitored for both faecal coliforms and enterococci, with many sites ranked equally.

Ten of the 11 swimming areas in Pittwater were ranked equal first (Table 15). Bayview Baths ranked equal fifth.

## Actions to improve water quality

Actions specific to individual swimming sites are included on the 'swimming area' pages. Improvements in water quality with Pittwater will also be achieved as a result of the implementation of management plans and other council programs.

## Pittwater Council

*Stormwater Management Plan:* Pittwater Council has an ongoing review of the actions and priorities in its stormwater management plan. The plan identifies a number of priority actions for improving stormwater quality. These include the installation and maintenance of stormwater management systems and community education and awareness in regards to pollution management.

*Stormwater Management Services Charge Program:* In 2007–2008, Council introduced a Stormwater Management Services Charge to fund additional investigations and activities towards improving stormwater quality, managing stormwater flows and flooding, and harvesting and reusing stormwater. Activities under the program are reviewed annually.

*Pittwater Estuary Management Plan:* The draft Pittwater Estuary Management Plan is being updated with further community input. The development of the plan receives funding through DECCW's Estuary Management Program and addresses water quality as a key issue.

*Winnererremy Bay restoration:* Restoration works have been under way in Winnererremy Bay for the past few years. Current works include the restoration of saltmarsh and bushland, and the creation of foreshore paths and visitor facilities in Rowland Reserve. Restoration works are being carried out in conjunction with the Friends of Winnererremy Bay.

*Rowland Reserve Rehabilitation:* Council has undertaken a major project to address foreshore erosion at Rowland Reserve. A rock revetment, combined with saltmarsh and mangrove planted areas, a beach area and viewing deck is being constructed with the assistance of grants from the Environmental Trust.

*Pittwater Spotted Gum Regeneration Project:* The western foreshores of Pittwater are being rehabilitated under a grant from the Hawkesbury-Nepean Catchment Management Authority.

*Careel Creek Rehabilitation Plan – Stage 1 Issues Paper:* Preliminary investigations have commenced into finding the sources of the water quality and odour issues affecting Careel Creek. The investigations will form an issues paper to guide the development of a Rehabilitation Plan for Careel Creek. The project is being supported by the State Government's Estuary Management Program.

*Community education:* Council continues to implement its stormwater pollution prevention program for construction sites. Education efforts with tradespersons aim to ensure sound environmental practices are being undertaken on site.

*Community and Industry Stormwater Education Program:* Council is progressively developing a strategy to deliver stormwater education including website information and other materials.

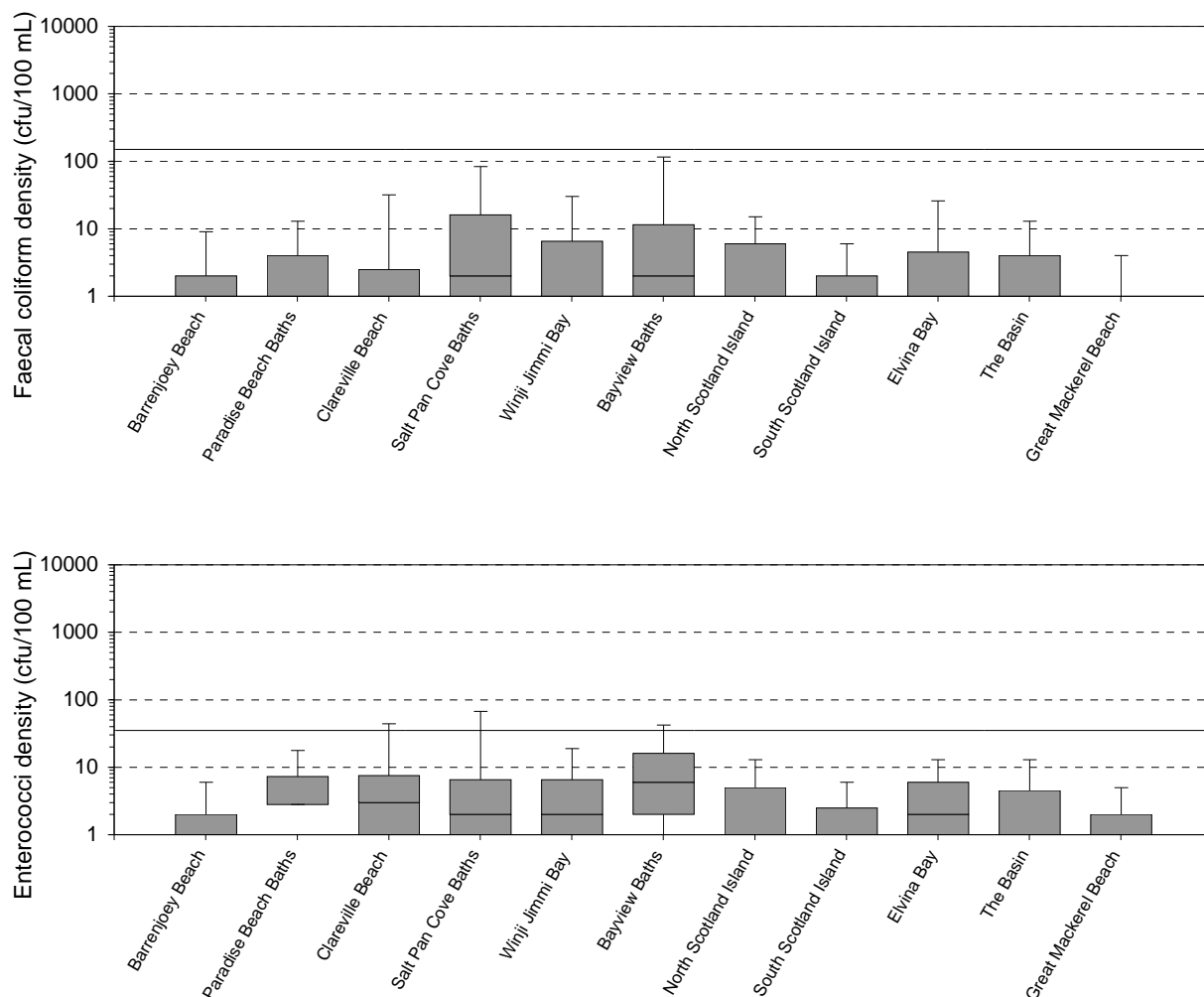
#### *Sydney Water*

Across the catchment of the beaches from Salt Pan Cove Baths to Bayview Baths, Sydney Water is cleaning and inspecting the sewer mains that have a high likelihood of discharging sewage to waterways if they become blocked. Where problems are identified they will be fixed by repair or preventive maintenance.

**Table 15: Compliance and Ranking of Pittwater Sites during Summer 2008–2009**

Site	Compliance (%)		Overall rank (out of 14)
	Faecal Coliforms	Enterococci	
Barrenjoey Beach	100	100	1
Paradise Beach Baths	100	100	1
Clareville Beach	100	100	1
Salt Pan Cove Baths	100	100	1
Winji Jimmi Bay	100	100	1
Bayview Baths	100	88	5
North Scotland Island	100	100	1
South Scotland Island	100	100	1
Elvina Bay	100	100	1
The Basin	100	100	1
Great Mackerel Beach	100	100	1

**Figure 22: Bacterial Levels at Pittwater Sites during Summer 2008–2009**



# Barrenjoey Beach

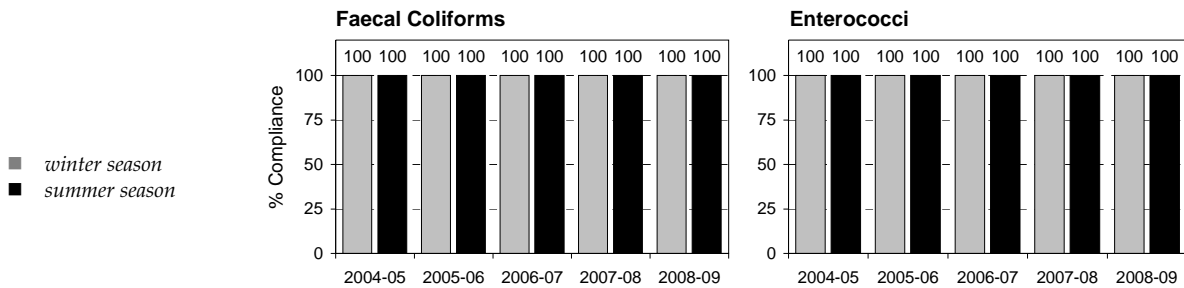
See page 188 for key to map

**Description** Barrenjoey Beach is approximately 1.5 kilometres long and located on the north-eastern foreshore of Pittwater. Palm Beach Reserve backs Barrenjoey Beach.

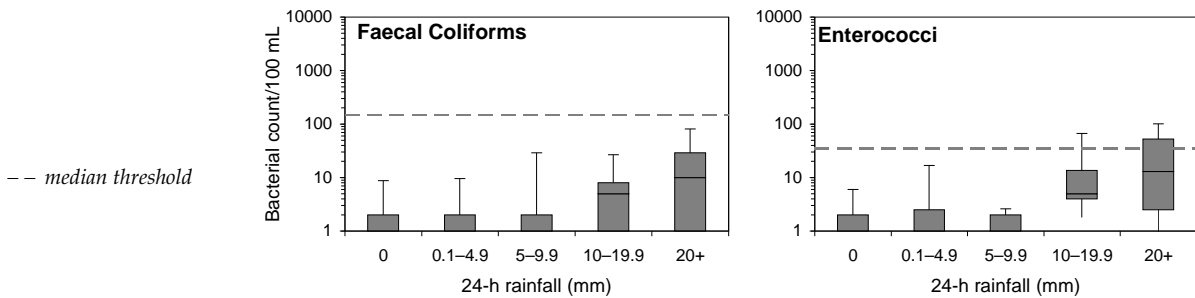
**Pollution sources** A small stormwater drain discharges to the beach.

**Actions** Targeted weed removal activities are carried out by Pittwater Council in the area.

**Compliance** Faecal coliform and enterococci levels have complied with swimming guidelines 100% of the time over the last five years.

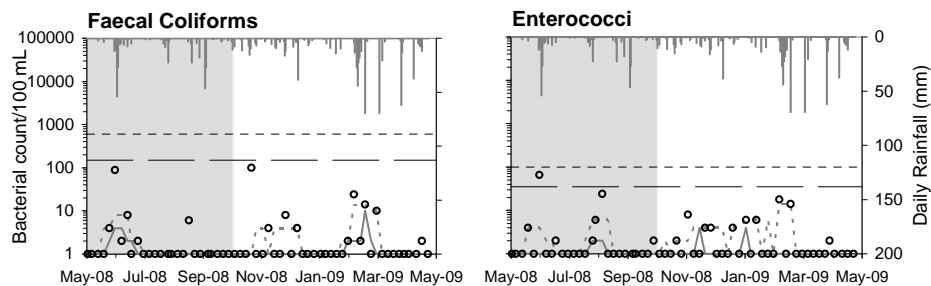


**Response to rainfall** Faecal coliform densities increased slightly with increasing rainfall but generally remained below the median guideline limit across all rainfall categories. Enterococci densities generally increased with increasing rainfall, occasionally exceeding the median guideline limit after ten millimetres of rain or more, and often exceeding the median guideline limit after 20 millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - - - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - - - 80<sup>th</sup> percentile threshold



# Paradise Beach Baths

See page 188 for key to map

## Description

Paradise Beach Baths is a 30 by 20 metre netted swimming enclosure located on the eastern foreshore of Pittwater and is backed by a narrow sandy beach and a small park area.

## Pollution sources

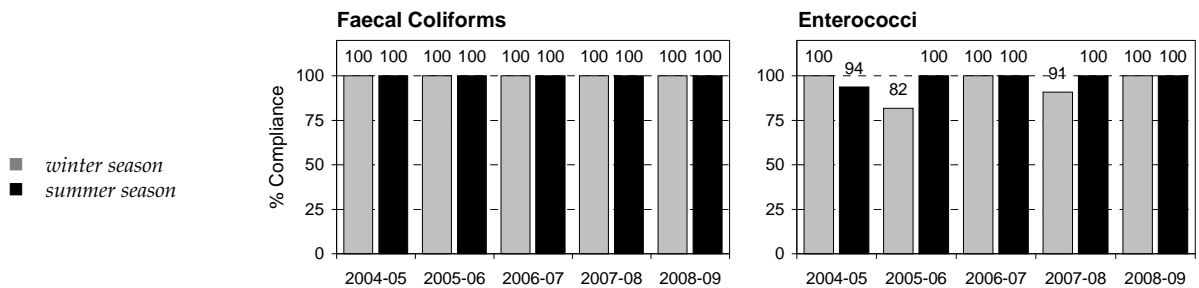
A stormwater drain discharges alongside the swimming enclosure. Two small stormwater drains discharge to the beach.

## Actions

There are no actions specific to this beach.

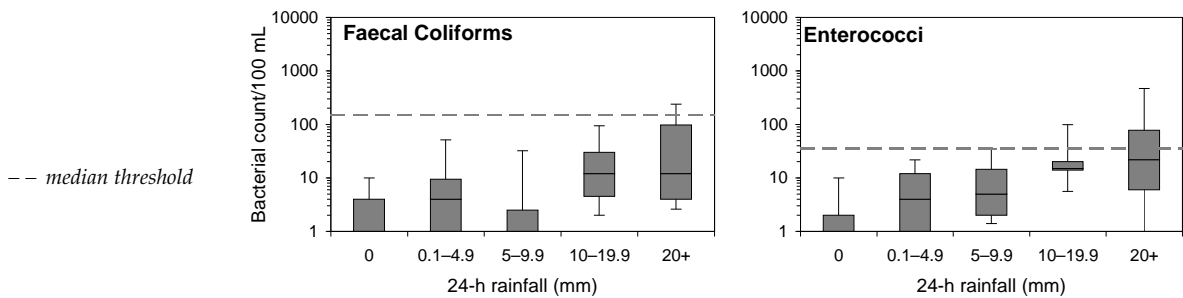
## Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance has also been high, ranging from 82% to 100% over the last five years.



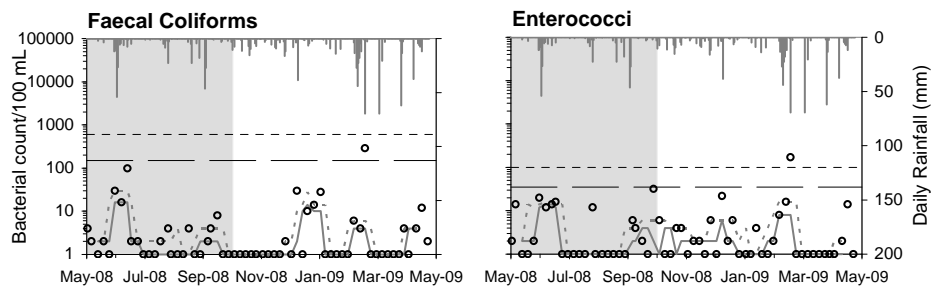
## Response to rainfall

Bacterial densities generally increased with increasing rainfall. Faecal coliform densities occasionally exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit in response to ten millimetres of rain or more, and often exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - - - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - - - 80<sup>th</sup> percentile threshold



# Clareville Beach

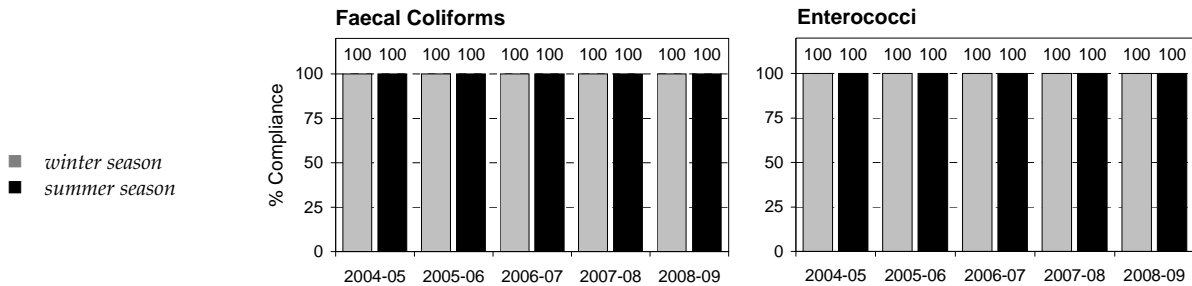
See page 188 for key to map

**Description** Clareville Beach is a narrow, 250 metre long beach located on the eastern foreshore of Pittwater. A grassy park area backs the beach, with picnic facilities at the northern end.

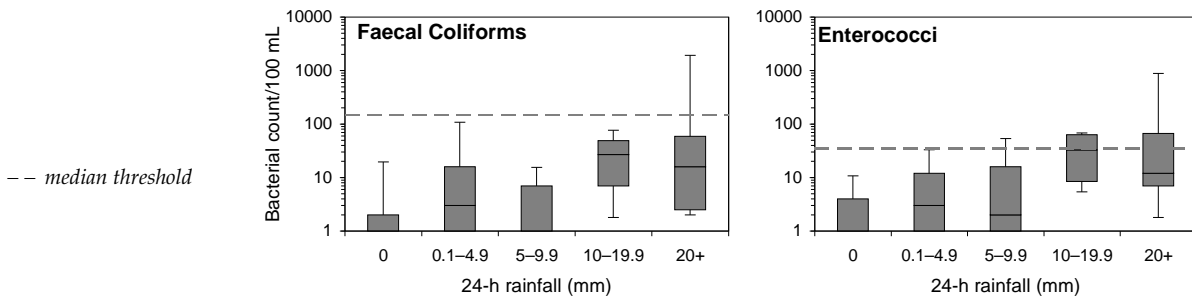
**Pollution sources** Three small stormwater drains discharge to the beach.

**Actions** There are no actions specific to this beach.

**Compliance** Faecal coliform and enterococci levels complied with swimming guidelines 100% of the time over the last five years.

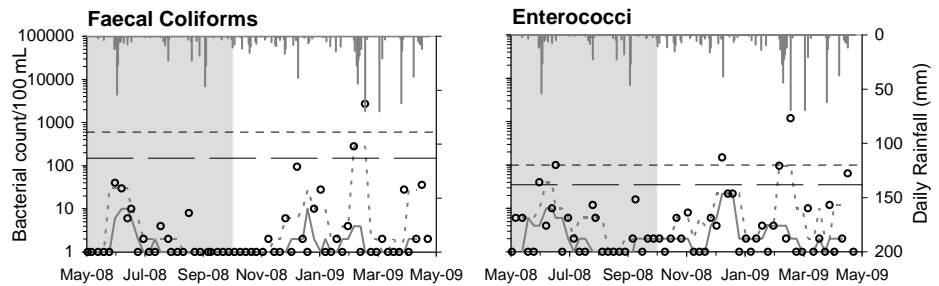


**Response to rainfall** Bacterial densities generally increased with increasing rainfall. Faecal coliform densities occasionally exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit after five millimetres of rain or more, and often exceeded the median guideline limit after ten millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - - - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - - - 80<sup>th</sup> percentile threshold



# Salt Pan Cove Baths

See page 188 for key to map

## Description

Salt Pan Cove Baths is a 20 by 30 metre netted swimming enclosure located on the south-eastern foreshore of Pittwater.

## Pollution sources

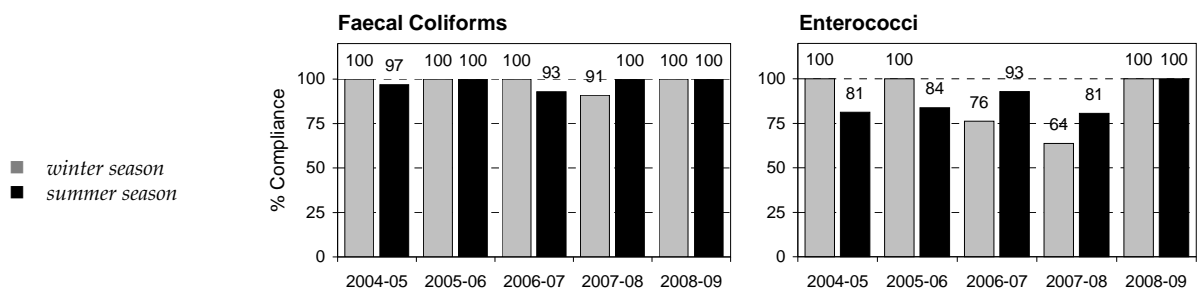
A stormwater drain discharges alongside the swimming enclosure and another into the bay.

## Actions

Sydney Water is cleaning and inspecting sewer mains across the catchment. Where problems are identified they will be fixed.

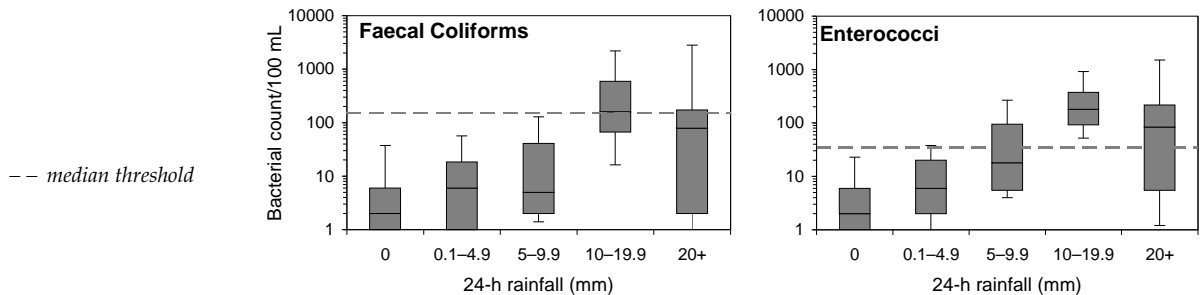
## Compliance

Faecal coliform compliance ranged from 91% to 100% over the last five years. Enterococci compliance has been more varied, ranging from 64% to 100% over the last five years.



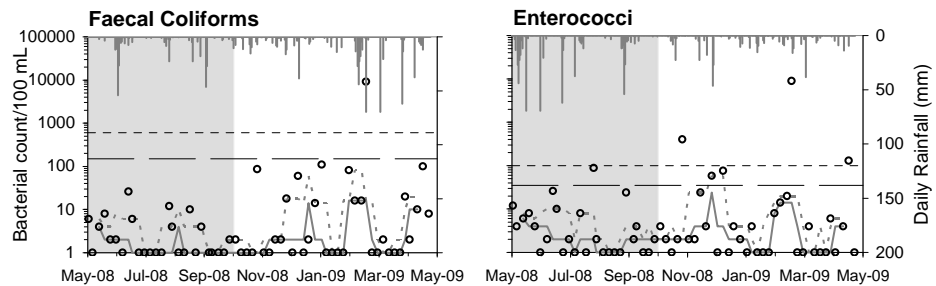
## Response to rainfall

Bacterial densities generally increased with increasing rainfall. Faecal coliform densities regularly exceeded the median guideline limit after ten millimetres of rain or more in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit after light rain and usually after ten millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - - - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - - - 80<sup>th</sup> percentile threshold



# Winji Jimmi Bay

See page 188 for key to map

## Description

Winji Jimmi Bay is a poorly flushed swimming area in the south-eastern corner of Pittwater. It is backed by a grassy park in which a dog exercise area is located.

## Pollution sources

Stormwater drains and sewage overflows discharge to the bay. Dog droppings from the dog exercise area in the park and illegal discharge of untreated sewage from boats moored in the bay are issues.

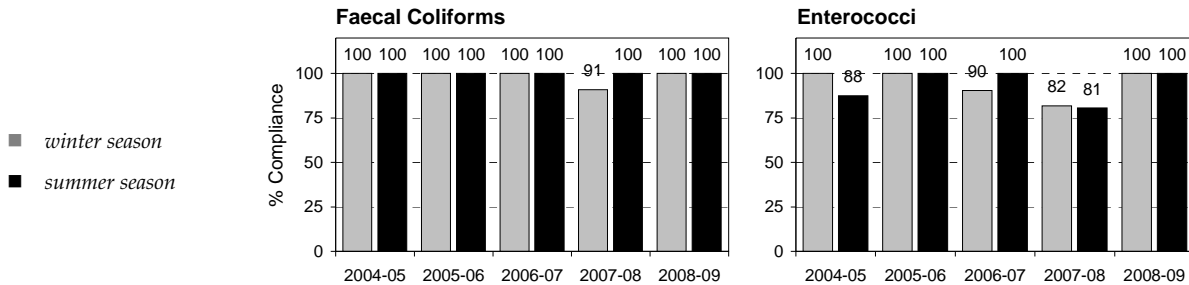
## Actions

Regeneration work is continuing in the Winnererremy Bay area to restore saltmarsh and bushland habitats. Visitor facilities within Rowland Reserve are being upgraded. Sydney Water is cleaning and inspecting sewer mains across the catchment. Where problems are identified they will be fixed.



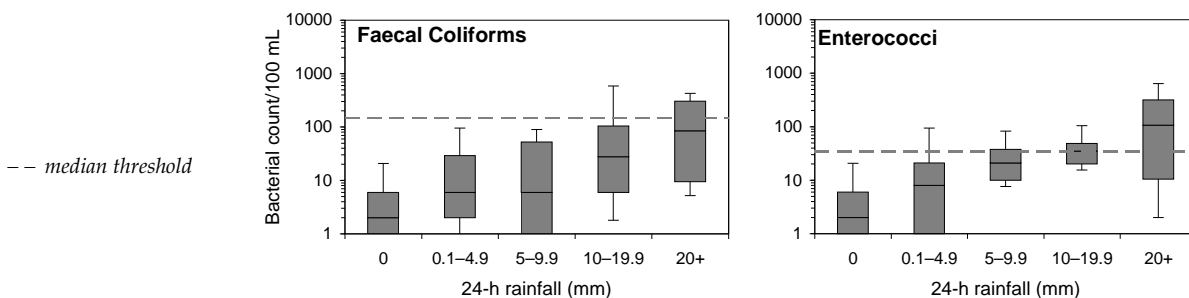
## Compliance

With the exception of winter 2007–2008, faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance with swimming guidelines has ranged from 81% to 100% over the last five years.



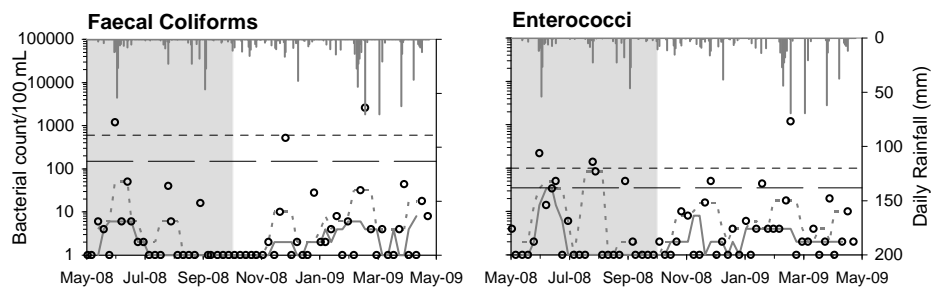
## Response to rainfall

Bacterial levels generally increased with increasing rainfall. Faecal coliform densities often exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline limit after light rain and regularly exceeded the median guideline limit after 20 millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - 80<sup>th</sup> percentile threshold



# Bayview Baths

See page 188 for key to map

## Description

Bayview Baths is a 20 by 40 metre netted swimming enclosure located on the southern foreshore of Pittwater. The wharf from which samples are taken forms one side of the swimming enclosure. Bayview Baths has a narrow sandy beach that is backed by a small grassy park area. Bayview Baths are considerably silted up and rarely used for swimming.



## Pollution sources

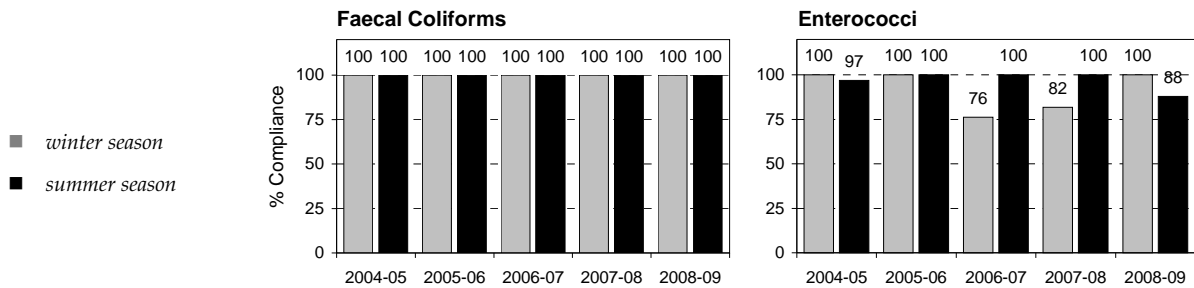
A stormwater drain discharges directly alongside the baths and a sewage overflow structure is located in the vicinity of the baths.

## Actions

Sydney Water is cleaning and inspecting sewer mains across the catchment. Where problems are identified they will be fixed.

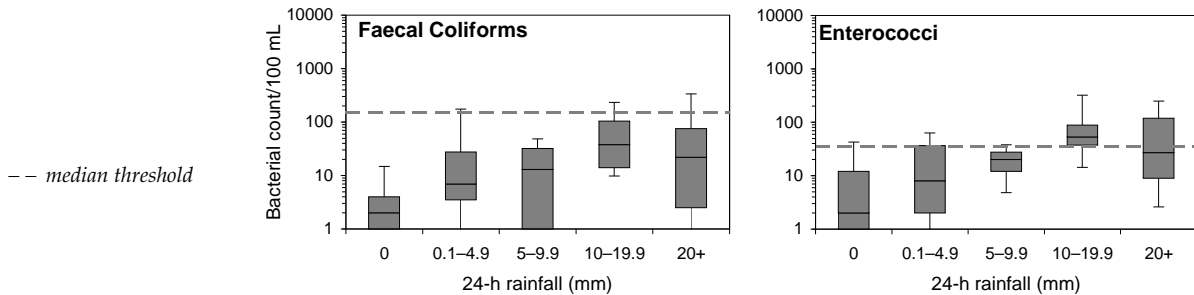
## Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance has been more varied, ranging from 76% to 100% over the last five years.



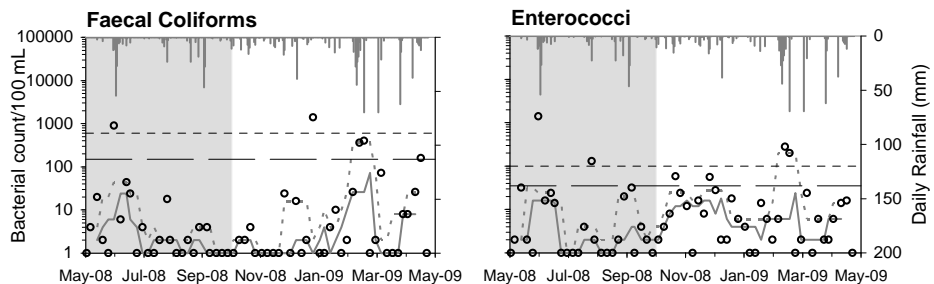
## Response to rainfall

Bacterial densities generally increased with increasing rainfall. Faecal coliform levels occasionally exceeded the median guideline limit in response to light rain in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline limit after no rain and frequently exceeded the median guideline limit in response to ten millimetres of rain or more in the previous 24 hours. A dry-weather contamination problem is indicated.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - 80<sup>th</sup> percentile threshold



# North Scotland Island

See page 188 for key to map

## Description

North Scotland Island is a 15 by 50 metre netted swimming enclosure located on the north side of Scotland Island in Pittwater. The wharf from which samples are taken forms one side of the swimming enclosure. A park with picnic facilities backs the swimming area.



## Pollution sources

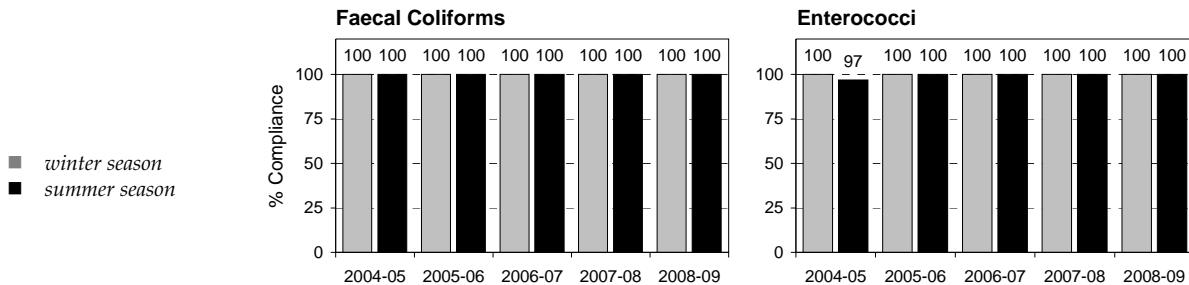
Septic tank seepage and runoff in wet weather from residential properties are potential sources. An open stormwater drain discharges in the vicinity of the sampling site.

## Actions

A draft Stormwater Drainage Management Plan for Scotland Island has been prepared in collaboration with the Scotland Island Residents Association to address stormwater and erosion issues.

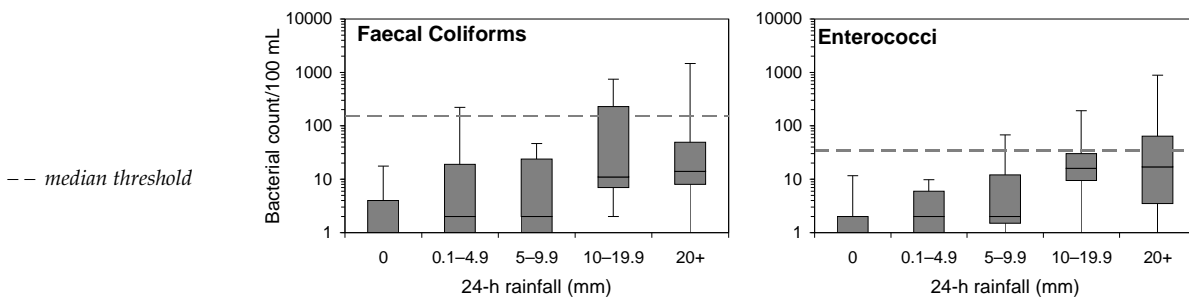
## Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. With the exception of summer 2004–2005, enterococci levels complied with swimming guidelines 100% of the time over the last five years.



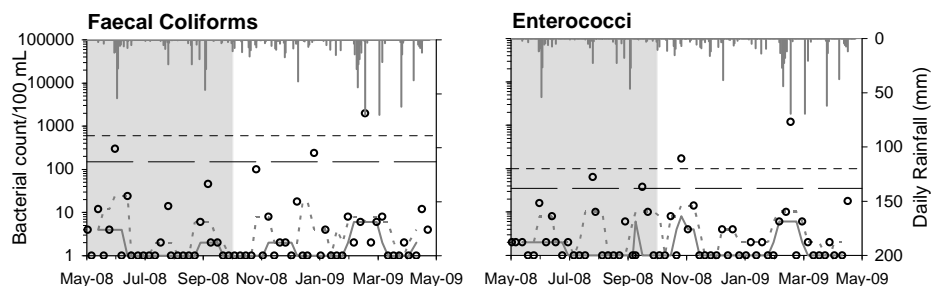
## Response to rainfall

Bacterial densities generally increased with increasing rainfall. Faecal coliform densities occasionally exceeded the median guideline limit after light rain, and often exceeded the median guideline limit after ten millimetres of rain or more in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit after five millimetres of rain or more, and often exceeded the median guideline limit after 20 millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - 80<sup>th</sup> percentile threshold



# South Scotland Island

See page 188 for key to map

## Description

The South Scotland Island monitoring site is located at Carols Wharf, an unnetted swimming area located on the south side of Scotland Island. A reserve backs the swimming area.

## Pollution sources

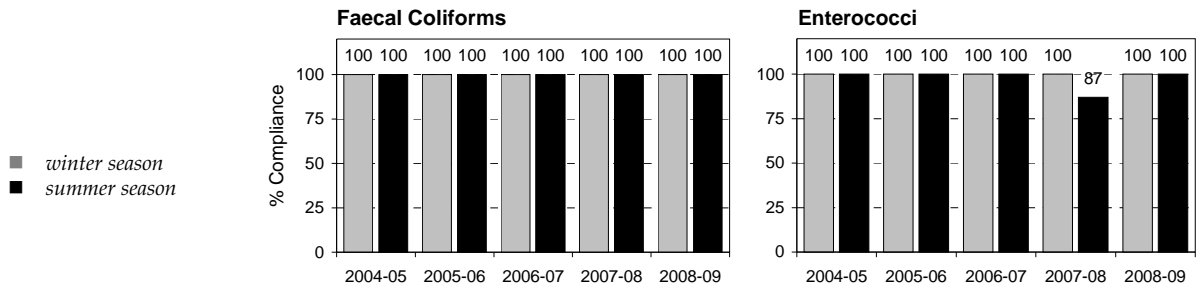
Septic tank seepage and runoff occur in wet weather from residential properties.

## Actions

A draft Stormwater Drainage Management Plan for Scotland Island has been prepared in collaboration with the Scotland Island Residents Association to address stormwater and erosion issues.

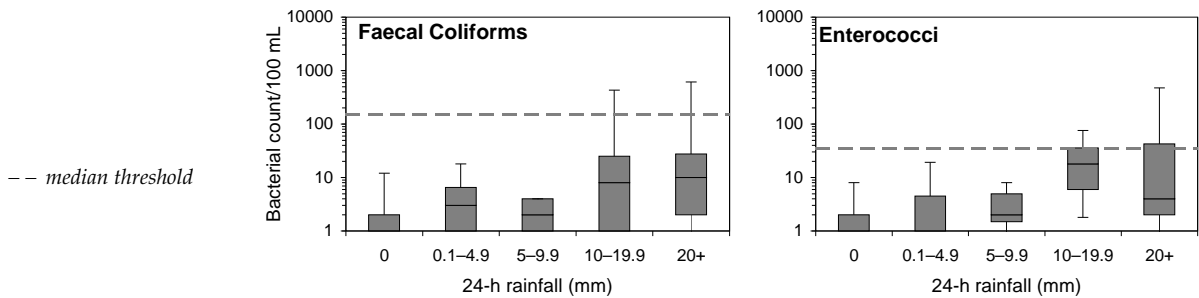
## Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. With the exception of summer 2007–2008, enterococci levels complied with swimming guidelines 100% of the time over the last five years.



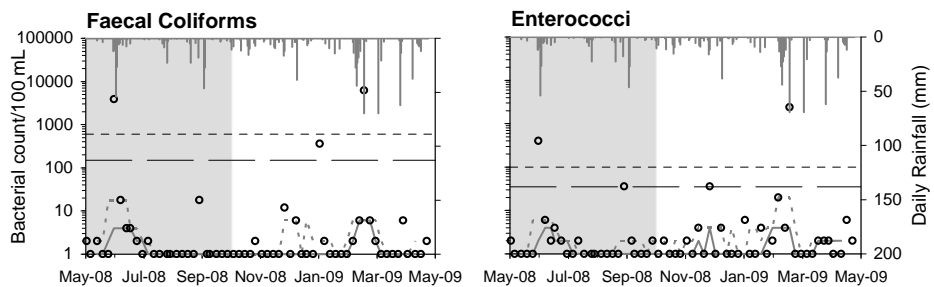
## Response to rainfall

Bacterial densities tended to increase with increasing rainfall. Faecal coliform densities occasionally exceeded the median guideline limit after ten millimetres of rain or more in the previous 24 hours. Enterococci densities often exceeded the median guideline limit in response to ten millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - - - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - - - 80<sup>th</sup> percentile threshold



# Elvina Bay

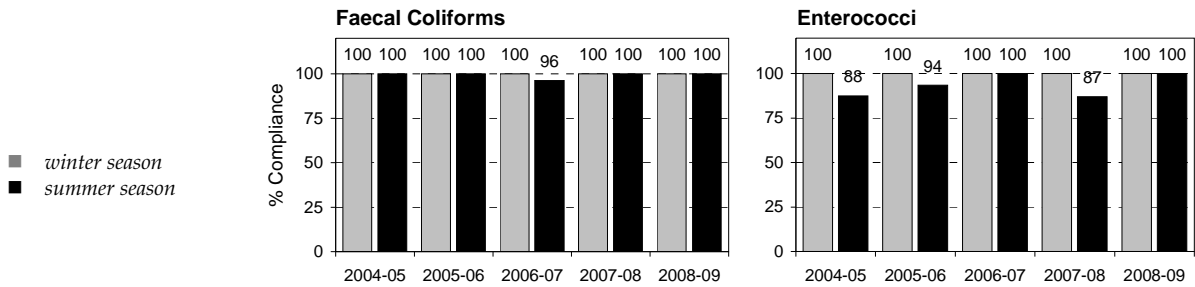
See page 188 for key to map

**Description** Elvina Bay is an unnetted swimming area on the south-western foreshore of Pittwater. Beachwatch samples are taken at the Elvina South Wharf on the southern side of Elvina Bay.

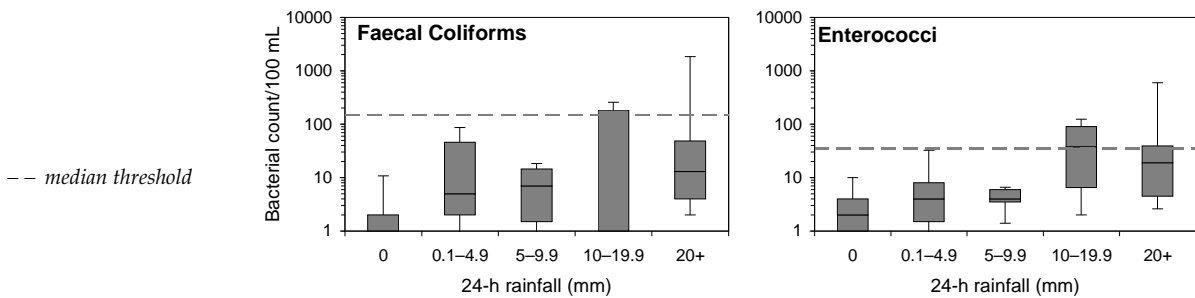
**Pollution sources** Open stormwater drains discharge to Elvina Bay. Septic tank seepage and runoff in wet weather from residential properties are issues.

**Actions** There are no actions specific to this swimming site.

**Compliance** With the exception of summer 2006–2007, faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance has varied, ranging between 87% and 100% over the last five years.



**Response to rainfall** Bacterial levels generally increased with increasing rainfall. Faecal coliform densities often exceeded the median guideline limit in response to ten millimetres of rain or more in the previous 24 hours. Enterococci densities regularly exceeded the median guideline limit in response to ten millimetres of rain or more in the previous 24 hours.

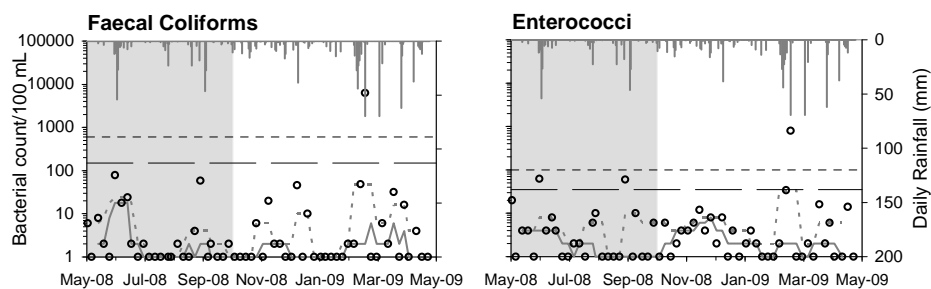


**Season data**

- | rainfall
- o individual result
- rolling median
- rolling 80<sup>th</sup> percentile

**Guidelines**  
(see page 8 for details)

- median threshold
- 80<sup>th</sup> percentile threshold



# The Basin

See page 188 for key to map

## Description

The Basin is a 500 metre sandy beach on the western side of Pittwater, backed by Ku-ring-gai Chase National Park. The sampling site is located at The Basin Wharf. This very popular area is also known as Coasters Retreat.



## Pollution sources

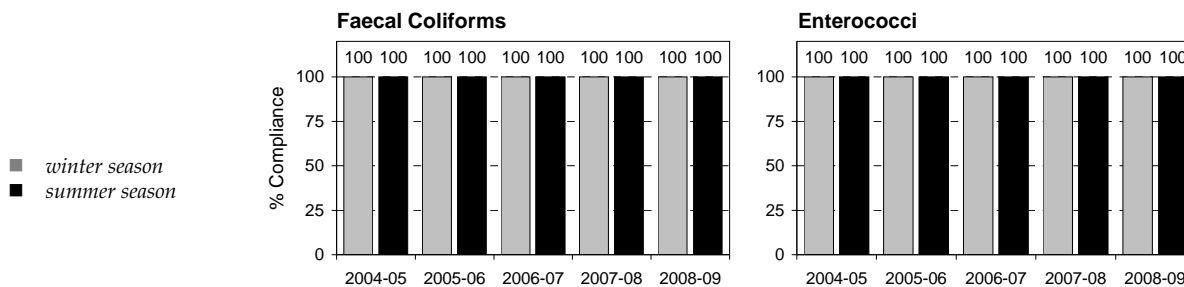
Heavy boat traffic at holiday times may result in poor water quality from illegal discharge of boat effluent.

## Actions

There are no actions specific to this swimming site.

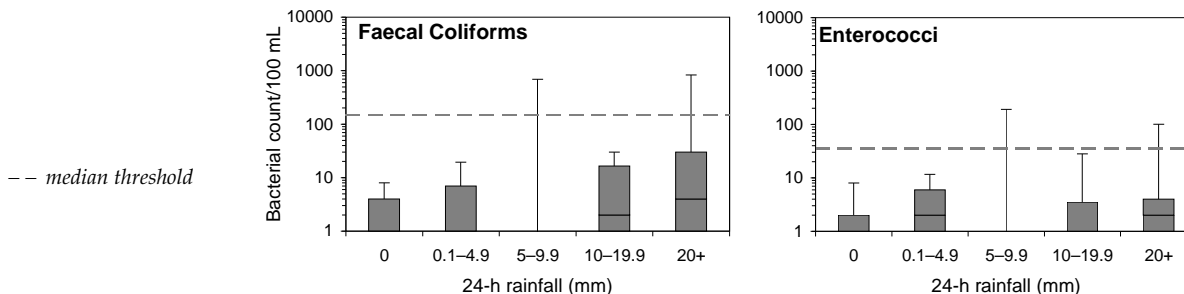
## Compliance

Faecal coliform and enterococci levels complied with swimming guidelines 100% of the time over the last five years.



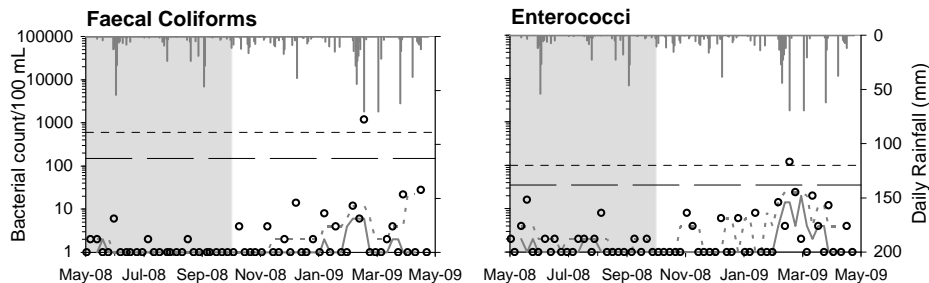
## Response to rainfall

Bacterial densities increased slightly with increasing rainfall. Faecal coliform and enterococci densities occasionally exceeded the median guideline limit in response to five millimetres of rain or more in the previous 24 hours.



## Season data

- | rainfall
  - o individual result
  - rolling median
  - - - rolling 80<sup>th</sup> percentile
- Guidelines  
(see page 8 for details)
- median threshold
  - - - 80<sup>th</sup> percentile threshold



# Great Mackerel Beach

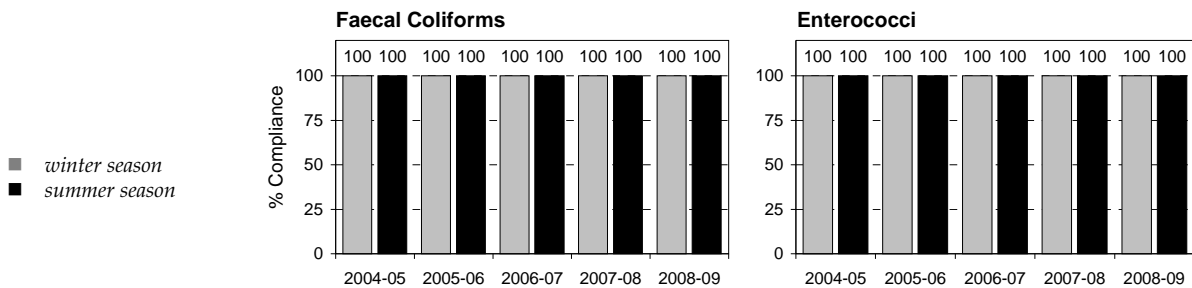
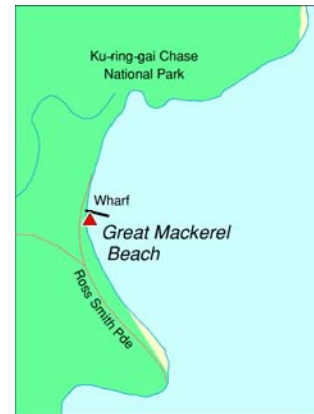
See page 188 for key to map

**Description** Great Mackerel Beach is a 500 metre long sandy beach on the north-western side of Pittwater. The northern end is backed by Ku-ring-gai Chase National Park and the southern by a residential area. Mackerel Beach Wharf is situated in the middle of the beach.

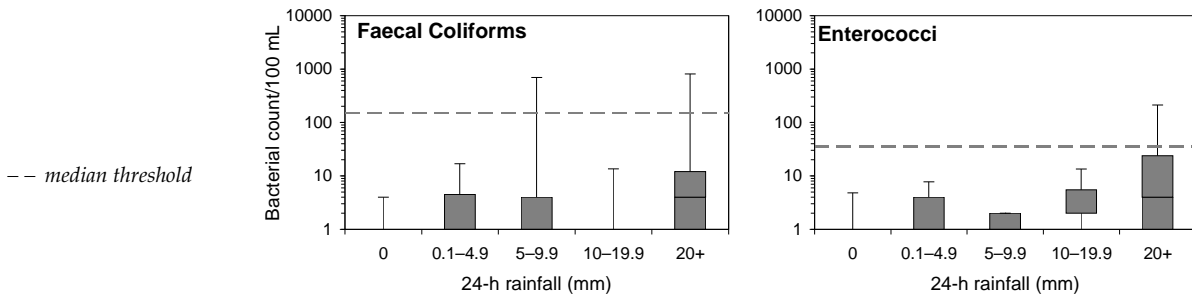
**Pollution sources** Runoff from the residential area during rain may be a source of pollution.

**Actions** A draft Floodplan Risk Management Study and Plan is being prepared by Pittwater Council.

**Compliance** Faecal coliform and enterococci levels complied with swimming guidelines 100% of the time over the last five years.



**Response to rainfall** Bacterial densities increased slightly with increasing rainfall. Faecal coliforms densities occasionally exceeded the median guideline limit in response to five millimetres of rain or more in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours.



**Season data**

- | rainfall
- o individual result
- rolling median
- rolling 80<sup>th</sup> percentile

**Guidelines**  
(see page 8 for details)

- median threshold
- 80<sup>th</sup> percentile threshold

