

Chapter 4

The Harbourwatch Program

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 2007–2008 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

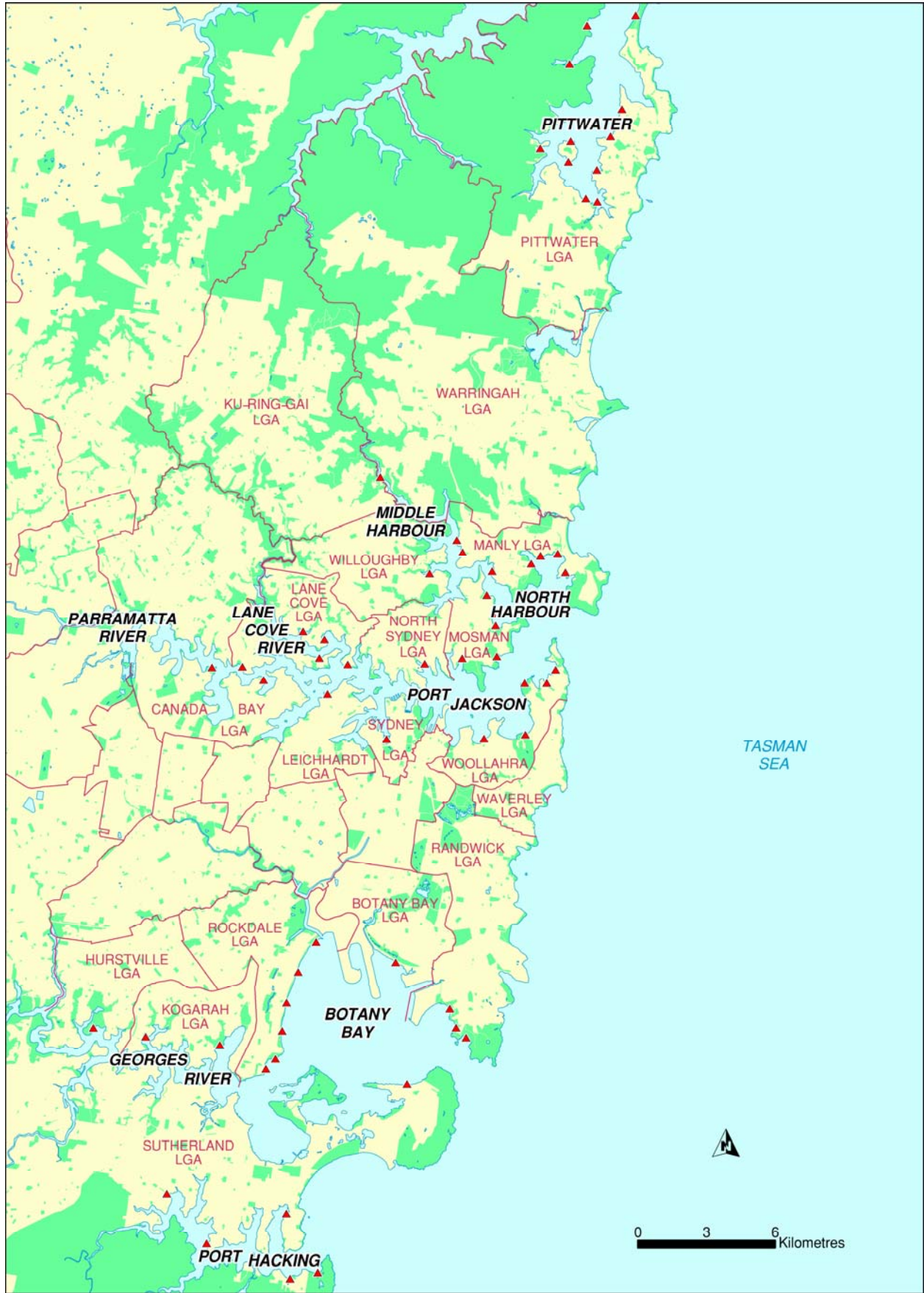
The beach pages give a brief description of the site, an assessment of water quality over the season, any pollution sources that can affect the site and any pollution reduction actions taking place in recent years. Water quality data are presented in three sections:

- 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 2007–2008 and the preceding winter season (2007).

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). 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, or by phone on (02) 9995 5344.

Sydney Metropolitan Area Harbour Swimming Sites



Summary

Ten of the 59 harbour swimming sites complied 100% with Beachwatch criteria for faecal coliforms and enterococci during the 2007–2008 summer season (Figure 20 and Figure 21). This is among the lowest level of compliance recorded for Sydney's harbour beaches, which has coincided with greater than average rainfall recorded in the Sydney region during 2007–2008. In fact, 2007 was the wettest year in Sydney since 1998, with above average rainfall similarly recorded during early 2008. The highest compliance result was obtained in the 2005–2006 summer season, when 51 of the 59 beaches complied 100% of the time. Rainfall during the 2005–2006 summer season was well below the long-term average, and was less than half the amount of rainfall recorded during the 2007–2008 summer season.

Improvements in water quality over the 2007–2008 summer season were recorded at five swimming sites. Compliance increased for one or both indicators at:

- Salt Pan Cove Baths and Elvina Bay in Pittwater
- Yarra Bay in Botany Bay
- Gunamatta Bay Baths and Jibbon Beach in Port Hacking.

Decreases in water quality over the 2007–2008 summer season were recorded at 49 swimming sites. Compliance decreased for one or both indicators at:

- Salt Pan Cove Baths, Winji Jimmi Baths, South Scotland Island and Elvina Bay in Pittwater
- Hayes Street Beach, 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, Foreshores Beach, 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.

Cleanest harbour swimming sites

Harbour swimming sites that complied 100% of the time with both bacterial indicators during summer 2007–2008 were:

- **Pittwater** – Barrenjoey Beach, Paradise Beach Baths, Clareville Beach, Bayview Baths, North Scotland Island, The Basin and Great Mackerel Beach
- **Sydney Harbour** – Nielsen Park and Fairlight Beach
- **Port Hacking** - Jibbon Beach.

Pittwater

Faecal coliform compliance

All of the 11 Pittwater swimming sites complied 100% with Beachwatch criteria for faecal coliforms for summer 2007–2008 (Figure 20).

Faecal coliform compliance improved seven percentage points at Salt Pan Cove Baths and four percentage points at Elvina Bay, from the previous summer season.

Enterococci compliance

Seven of the 11 Pittwater swimming sites recorded 100% compliance with Beachwatch enterococci criteria during summer 2007–2008. Although enterococci compliance fell at four locations, these sites recorded greater than 80% compliance with the enterococci criteria.

Salt Pan Cove Baths decreased by 12 percentage points, Winji Jimmi Bay decreased by 19 percentage points, and both South Scotland Island and Elvina Bay decreased by 13 percentage points.

Port Jackson

Faecal coliform compliance

Five of the eight swimming sites monitored in Port Jackson recorded 100% compliance with Beachwatch criteria for faecal coliforms (Figure 21).

Faecal coliform compliance fell at Hayes Street Beach (13 percentage points), Little Sirius Cove (16 percentage points) and Redleaf Pool (10 percentage point) from the previous summer season.

Enterococci compliance

Of the eight Port Jackson swimming sites, Nielsen Park recorded 100% compliance with Beachwatch criteria for enterococci (Figure 21).

Although a relatively high level of compliance was recorded at Clifton Gardens (94%) and Parsley Bay (94%), both sites fell six percentage points from the previous summer season. Similarly, decreases in enterococci compliance were noted at Hayes St Beach (26 percentage points), Little Sirius Cove (33 percentage points), Redleaf Pool (13 percentage points), Rose Bay Beach and Watsons Bay (16 percentage points) from the previous summer season.

North Harbour

Faecal coliform compliance

Two of the four North Harbour swimming sites recorded 100% compliance with the faecal coliform criteria.

High faecal coliform compliance was also recorded at Forty Baskets Pool (94%) and Little Manly Cove (94%), but there was a decline of six percentage points for both sites from the previous summer season.

Enterococci compliance

Of the four North Harbour swimming sites, only Fairlight Beach recorded 100% compliance with enterococci guidelines during summer 2007–2008.

High enterococci compliance was also recorded at Forty Baskets Pool (94%) and Manly Cove (94%), but these sites had a decline of six percentage points from the previous summer. Good enterococci results

at Little Manly Cove (84%) were recorded during summer 2007–2008, although compliance fell by 16 percentage points from the previous summer.

Middle Harbour

Faecal coliform compliance

During summer 2007–2008, three of the eight swimming sites in Middle Harbour recorded faecal coliform compliance of 100% (Figure 21).

Faecal coliform compliance decreased at five locations, including Davidson Reserve (26 percentage points), Gurney Crescent Baths (16 percentage points), Sangrado Baths (45 percentage points), Northbridge Baths (9 percentage points) and Clontarf Pool (29 percentage points) from the previous summer season.

Enterococci compliance

High compliance with the Beachwatch enterococci criteria was recorded at Chinamans Beach (94%), Edwards Beach (94%) and Balmoral Baths (90%) in Middle Harbour during summer 2007–2008.

Enterococci compliance fell across all Middle Harbour sites during the 2007–2008 from the previous summer season. Chinamans Beach, Edwards Beach and Balmoral Baths fell from perfect compliance in the previous summer season. A low level of compliance was recorded at Davidson Reserve (52%) and Sangrado Baths (42%), falls of 48 and 58 percentage points respectively. Enterococci compliance decreased at Gurney Crescent Baths (32 percentage points), Northbridge Baths (20 percentage points) and Clontarf Pool (23 percentage points) from the previous summer season.

Lower Lane Cove River

Faecal coliform compliance

The three lower Lane Cove River swimming sites recorded varied compliance with Beachwatch criteria for faecal coliforms during summer 2007–2008 (Figure 21). Woodford Bay had high compliance (97%), whilst Tambourine Bay (74%) and

Woolwich Baths (77%) recorded lower levels of faecal coliform compliance.

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

Enterococci compliance

All three lower Lane Cove River swimming sites recorded lower levels of compliance with Beachwatch criteria for enterococci during summer 2007–2008 (Figure 21) when compared with the previous summer season.

Tambourine Bay, Woodford Bay and Woolwich Baths fell 39, 23 and 29 percentage points respectively from the previous summer season results, when 100% compliance was recorded.

Lower Parramatta River

Faecal coliform compliance

Relatively high compliance with faecal coliform criteria was recorded at the five lower Parramatta River swimming sites during summer 2007–2008 (Figure 21).

Chiswick Baths complied 90% of the time with faecal coliform guidelines. Cabarita Beach, Henley Baths, Dawn Fraser Pool and Greenwich Baths all recorded 87% compliance, a decline in 13 percentage points at each site from the previous summer season.

Enterococci compliance

The five lower Parramatta River swimming sites recorded differing levels of compliance with Beachwatch enterococci criteria during summer 2007–2008 (Figure 21).

Good compliance was recorded at Dawn Fraser Pool (81%) and Greenwich Baths (84%), falls from the previous summer of 19 and 16 percentage points respectively. Henley Baths and Chiswick Baths both fell 23 percentage points, each recording 77% enterococci compliance. Cabarita Beach recorded a lower level of compliance, falling 32 percentage points from the 100% compliance recorded in the previous summer season.

Lower Georges River

Faecal coliform compliance

Five of the six lower Georges River swimming sites recorded 88% compliance with Beachwatch criteria for faecal coliforms during summer 2007–2008 (Figure 20).

Declines in faecal coliform compliance from the previous summer season were recorded across all sites in the lower Georges River. Jew Fish Bay Baths, Oatley Bay Baths, Sandringham Baths and Dolls Point Baths each fell by 12 percentage points from the previous summer season. Como Baths fell 6 percentage points. Faecal coliform compliance at Carss Point Baths (78%) decreased by 22 percentage points from the previous summer season's levels.

Enterococci compliance

The six lower Georges River swimming sites recorded varied compliance with Beachwatch criteria for enterococci during summer 2007–2008 (Figure 20).

Although falls in enterococci compliance were recorded at all sites in the lower Georges River, good enterococci compliance was still recorded at Jew Fish Bay Baths (88%), Sandringham Baths (94%) Dolls Point Baths (91%) and Como Baths (84%). Oatley Bay Baths fell 28 percentage points to 72% and Carss Point Baths recorded 59% compliance, a fall of 25 percentage points from the previous summer season.

Botany Bay

Faecal coliform compliance

Two of the nine Botany Bay swimming sites recorded 100% compliance with Beachwatch faecal coliform criteria (Figure 20).

Congwong Bay levels continued to comply with faecal coliform guidelines 100% of the time from the previous summer. Faecal coliform compliance at Yarra Bay improved by six percentage points to 100% compliance for the 2007–2008 summer season.

Compliance recorded at Monterey Baths (88%), Brighton-le-Sands Baths (88%) and Silver Beach (88%) fell by 12 percentage points from the previous year. Ramsgate Baths fell by 13 percentage points to 87%,

and Kyeemagh Baths fell 16 percentage points to 84%. Lower levels of compliance were recorded at Foreshores Beach (63%) and Frenchmans Bay (72%), declines of 28 and 25 percentage points respectively from the previous summer.

Enterococci compliance

Four of the nine Botany Bay swimming sites recorded 100% compliance with Beachwatch enterococci criteria (Figure 20). High compliance was also recorded at Congwong Bay (91%), a decline of three percentage points from the previous summer season.

Enterococci compliance fell by 22 percentage points at Kyeemagh Baths to 78%, and by three percentage points at Congwong Bay to 91%. Significantly lower levels of enterococci compliance were recorded at Foreshores Beach (44%), Yarra Bay (66%) and Frenchmans Bay (56%), decreases of 44, 18 and 35 percentage points respectively from the previous summer season.

Port Hacking

Faecal coliform compliance

Jibbon Beach in Port Hacking recorded 100% compliance with Beachwatch faecal coliform criteria during summer 2007–2008, an improvement of six percentage points (Figure 20).

Sites that did not achieve 100% faecal coliform compliance were Gunnamatta Bay Baths (81%), Lilli Pilli Baths (88%), Gymea Bay Baths (75%) and Horderns Beach (91%). Perfect compliance was recorded at these sites in the previous summer season.

Enterococci compliance

Lilli Pilli Baths and Jibbon Beach in Port Hacking recorded 100% compliance with enterococci criteria during summer 2007–2008.

Gunnamatta Bay Baths recorded 94% compliance, an improvement of 16 percentage points from the previous summer season.

A decrease on the 2006–2007 summer season results was recorded at Gymea Bay Baths (66%), with a fall of three percentage points, and Horderns Beach (91%), with a fall of nine percentage points.

Plans for improvement

Sewage overflows – SewerFix

Sydney Water is required by DECC Environment Protection Licence conditions to manage sewerage treatment systems efficiently, in order to protect and minimise harm to the environment and public health. The licence conditions require that the frequency and volume of sewage treatment plant bypasses and sewage overflows be reduced.

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

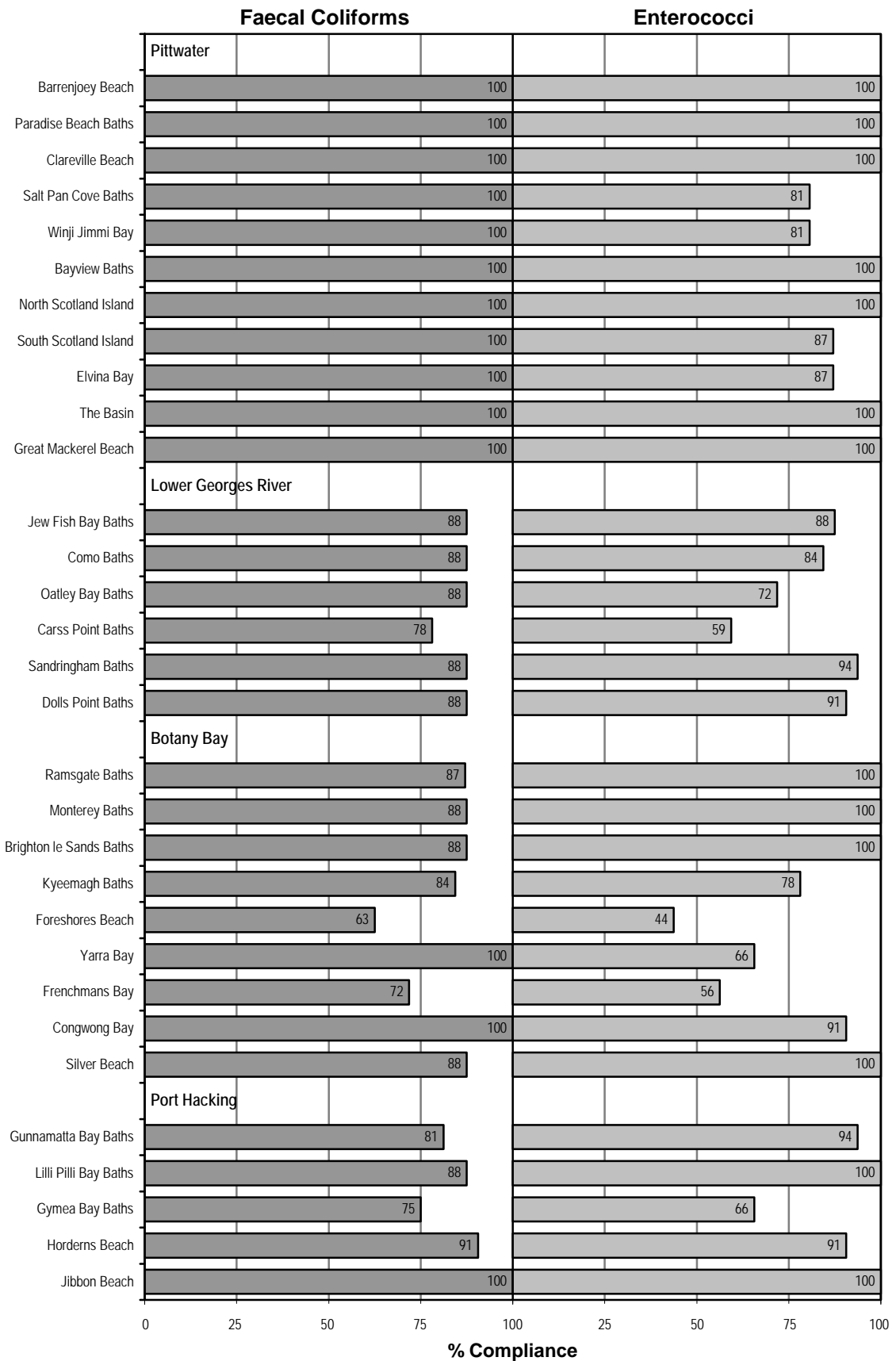
Stormwater

In 2008, \$30 million in 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 for up to three years. 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.

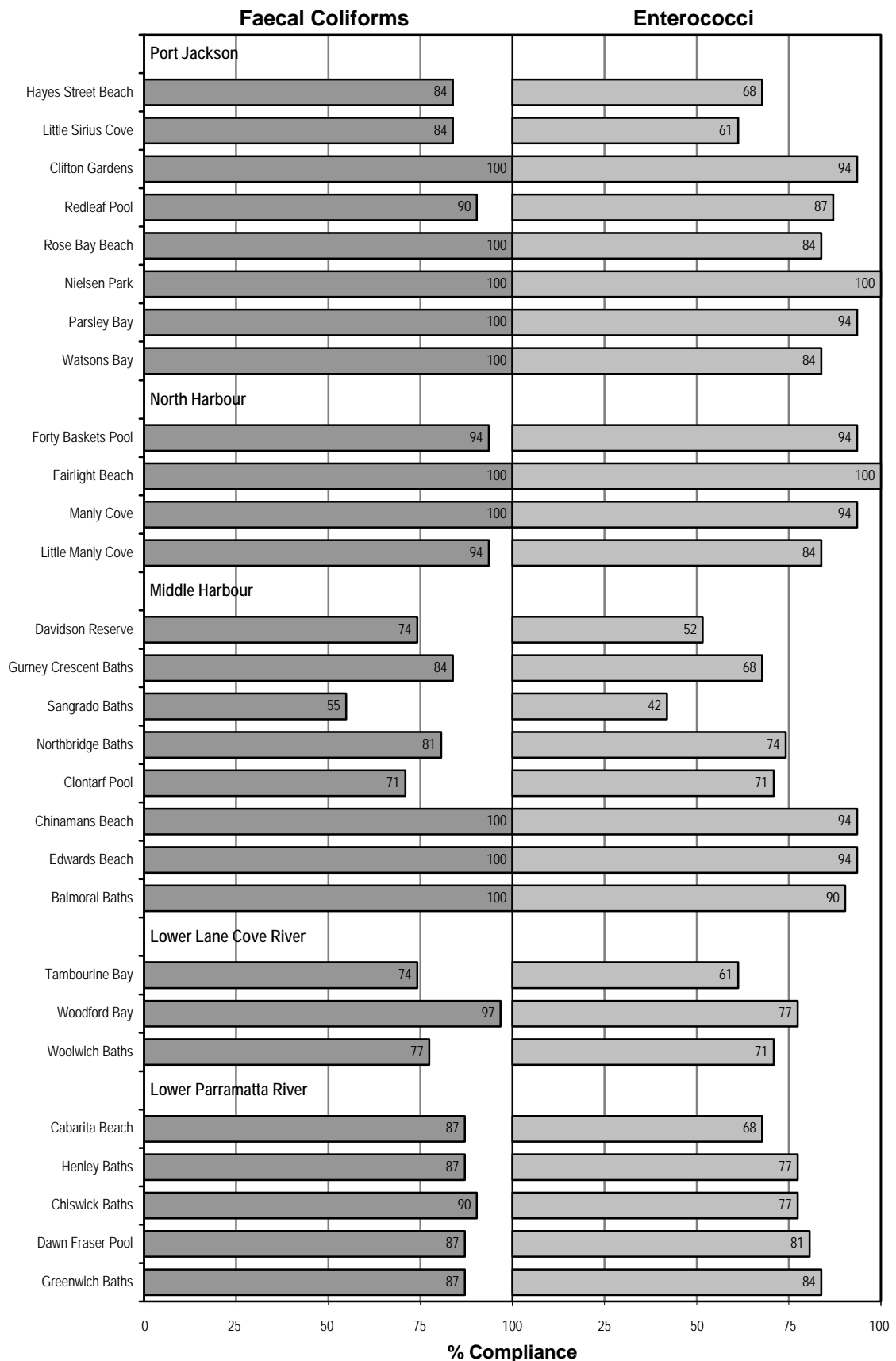
The NSW Government's Urban Stormwater Program was established in 1997 and concluded in 2006. A total of \$82 million in seed funding was provided to address stormwater quality hotspots and to give the stormwater industry and stormwater managers an opportunity to develop new ways of addressing poor stormwater 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 the Stormwater Environmental Improvement Program are presented in Chapter 2.

**Figure 20: Compliance of Harbourwatch Sites during Summer 2007–2008:
Pittwater, Lower Georges River, Botany Bay and Port Hacking**



**Figure 21: Compliance of Harbourwatch Sites during Summer 2007–2008:
Sydney Harbour**



Sydney Metropolitan Area Harbour Swimming Sites

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

Faecal coliform and enterococci compliances varied in Pittwater during summer 2007–2008 (Table 15).

Seven of the eleven Pittwater monitoring sites complied 100% of the time with both faecal coliform and enterococci guidelines. These sites were Barrenjoey Beach, Paradise Beach Baths, Clareville Beach, Bayview Baths, North Scotland Island, The Basin and Great Mackerel Beach.

Both Salt Pan Cove Baths and Winji Jimmi Bay complied 100% of the time with faecal coliform and 81% of the time with enterococci criteria. Similarly, South Scotland Island and Elvina Bay complied with faecal coliform criteria 100% of the time and with enterococci criteria 87% of the time.

The range of indicator bacteria levels measured at Pittwater swimming areas during summer 2007–2008 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 2007–2008. A total of 41 distinct ranks were determined for the 131 sites monitored for both faecal coliforms and enterococci, with many sites ranked equally.

Seven of the eleven swimming areas in Pittwater were ranked equal first (Table 15). South Scotland Island and Elvina Bay ranked equal seventh, and Salt Pan Cove Baths and Winji Jimmi Bay ranked equal tenth.

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 management plans and other council programs.

Pittwater Council

Stormwater Management Plan: Pittwater Council has been undertaking 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 ongoing maintenance of stormwater management systems, and community education and awareness in regards to pollution prevention and management.

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 DECC'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 will be starting an Environmental Trust supported project to rehabilitate the eroded foreshore at Rowland Reserve in 2008.

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 Works: Catchment sediments deposited in the creek were removed to improve general water quality.

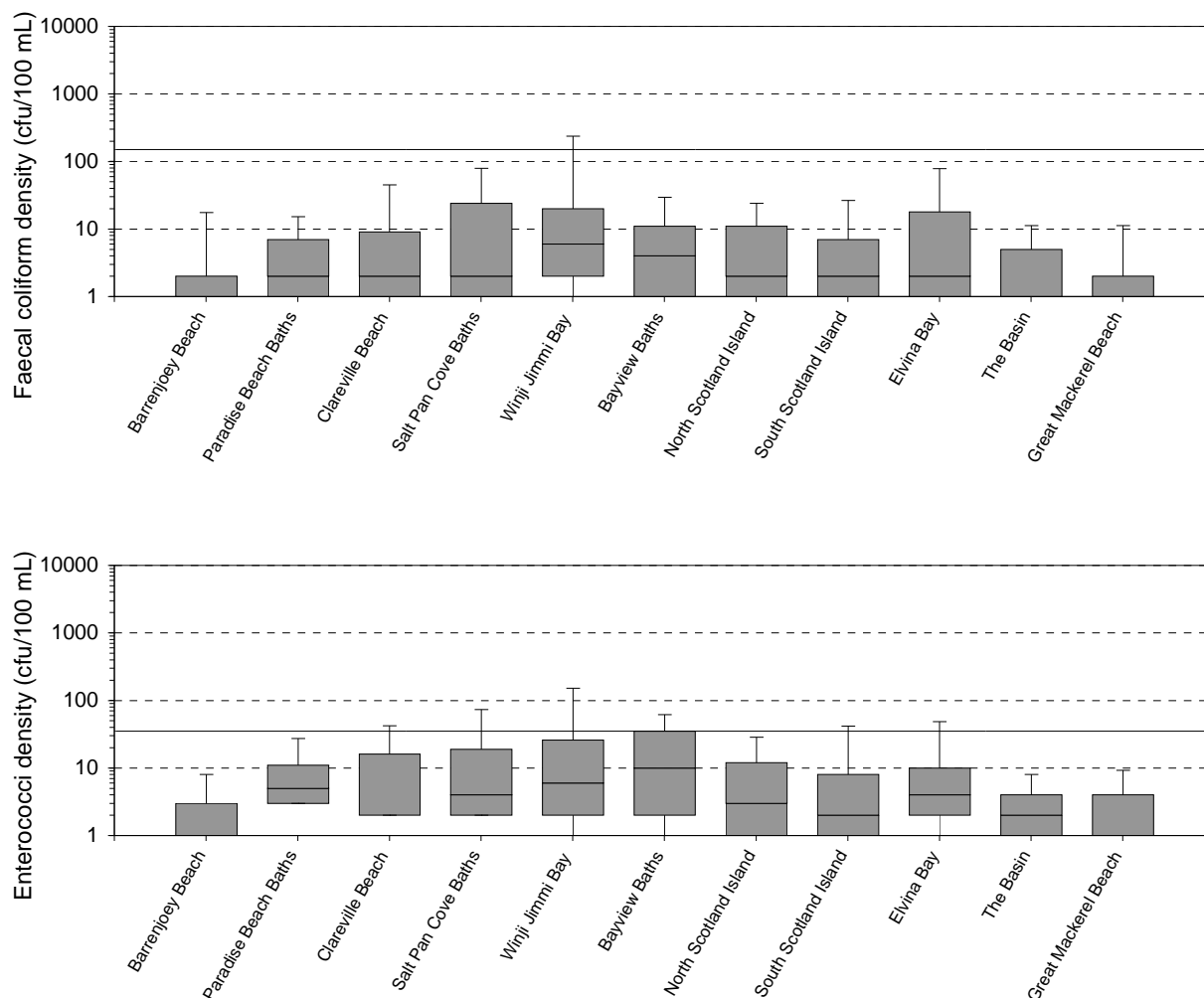
Community education: Council continues to implement its stormwater pollution prevention program for construction sites. Education efforts with tradespersons aim to ensure sound environmental practices are being undertaken on site.

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

Table 15: Compliance and Ranking of Pittwater Sites during Summer 2007–2008

Site	Compliance (%)		Overall rank (out of 41)
	Faecal Coliforms	Enterococci	
Barrenjoey Beach	100	100	1
Paradise Beach Baths	100	100	1
Clareville Beach	100	100	1
Salt Pan Cove Baths	100	81	10
Winji Jimmi Bay	100	81	10
Bayview Baths	100	100	1
North Scotland Island	100	100	1
South Scotland Island	100	87	7
Elvina Bay	100	87	7
The Basin	100	100	1
Great Mackerel Beach	100	100	1

Figure 22: Bacterial Levels at Pittwater Sites during Summer 2007–2008



Barrenjoey Beach

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.

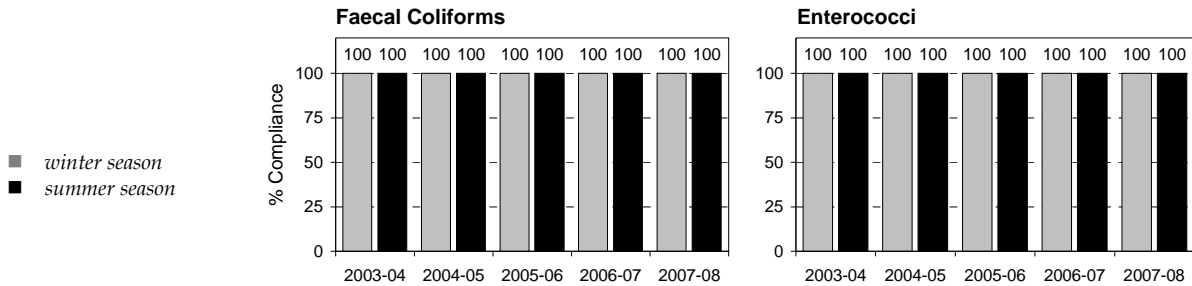
Actions

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

Compliance

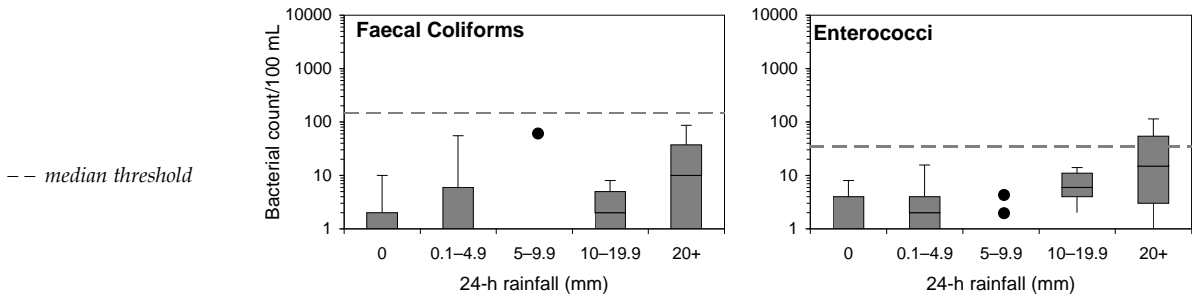
Faecal coliform and enterococci levels have complied with swimming guidelines 100% of the time over the last five years.

See page 186 for key to map



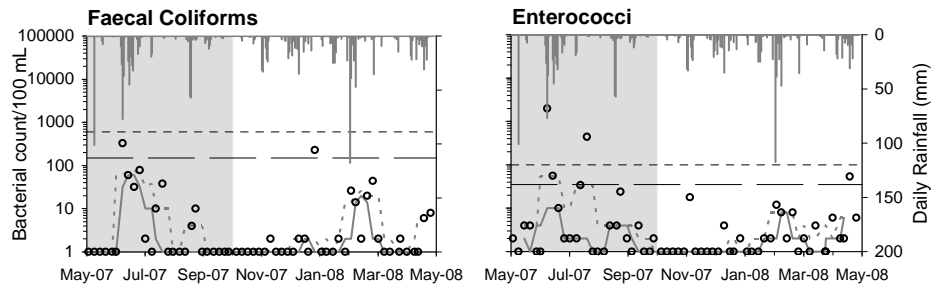
Response to rainfall

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 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 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - - - 80th percentile threshold



Paradise Beach Baths

See page 186 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

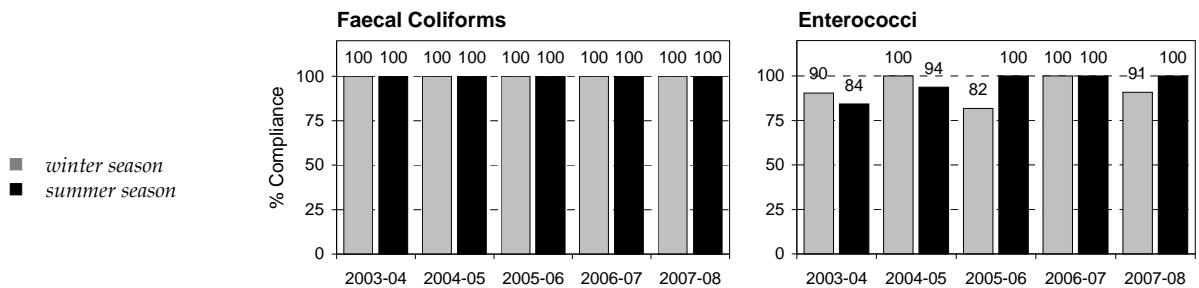
A stormwater drain discharges alongside the swimming enclosure. Two small stormwater drains discharge to the beach.

Actions

There are no actions specific to this beach.

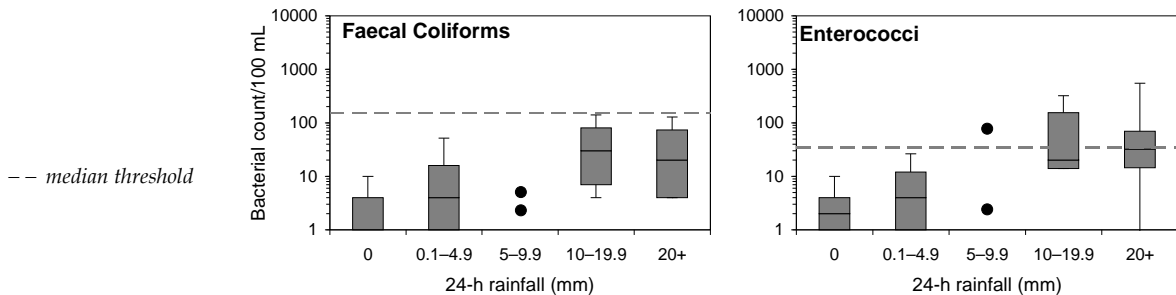
Compliance

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.



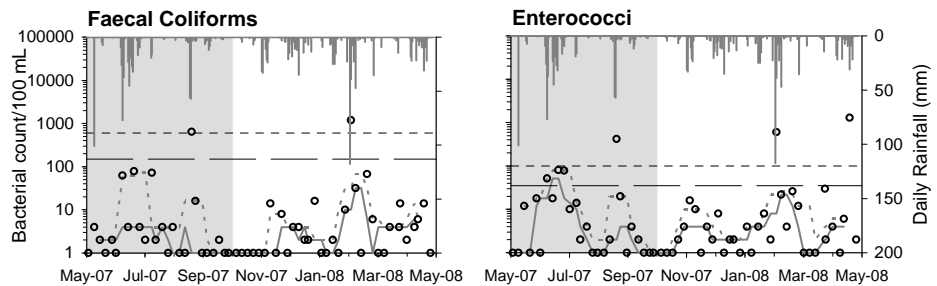
Response to rainfall

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, often exceeding 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 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - - - 80th percentile threshold



Clareville Beach

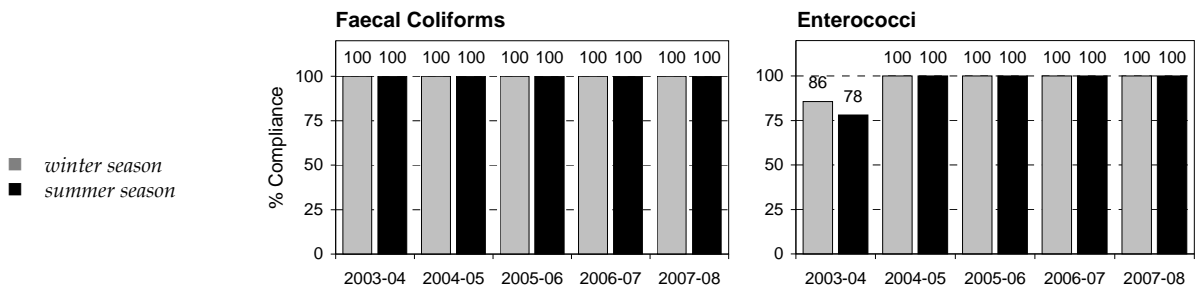
See page 186 for key to map

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.

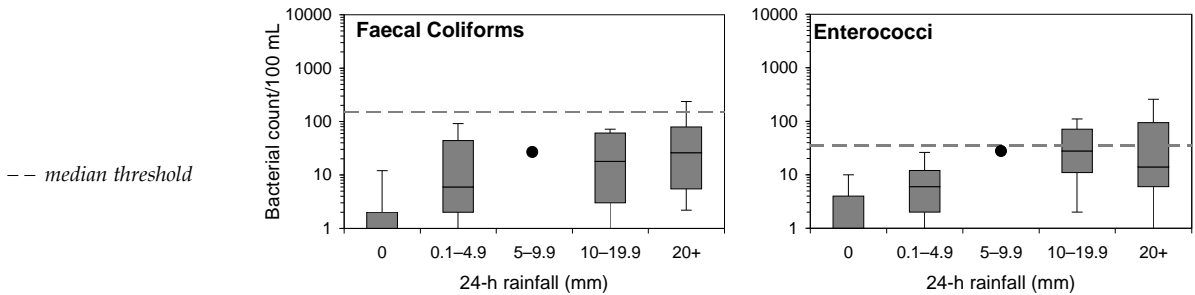
Pollution sources Three small stormwater drains discharge to the beach.

Actions There are no actions specific to this beach.

Compliance Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Except in 2003–2004, enterococci levels complied with swimming guidelines 100% of the time over the last five years.

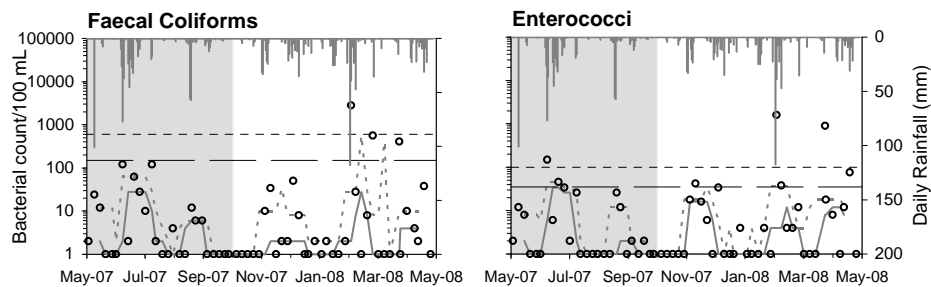


Response to rainfall Bacterial densities generally increased with increasing rainfall, with faecal coliform densities occasionally exceeding the median guideline limit after 20 millimetres of rain or more, and enterococci densities often exceeding the median guideline limit after ten millimetres of rain or more in the previous 24 hours.



Season data

- | rainfall
 - o individual result
 - rolling median
 - - - rolling 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - - - 80th percentile threshold



Salt Pan Cove Baths

See page 186 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

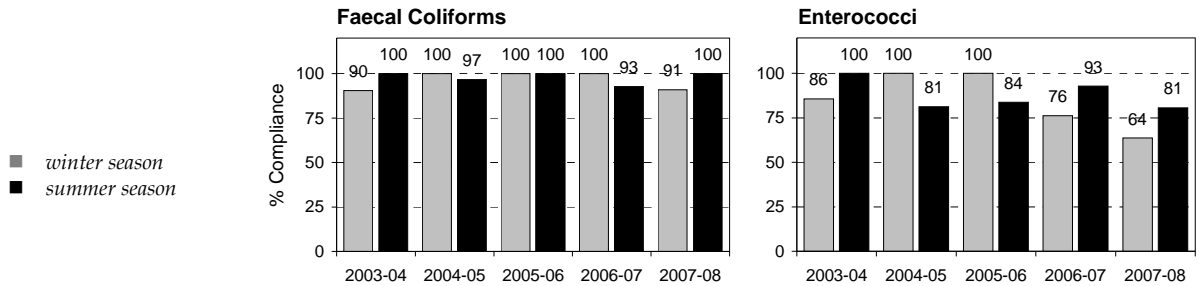
A stormwater drain discharges alongside the swimming enclosure and another into the bay.

Actions

There are no actions specific to this swimming site.

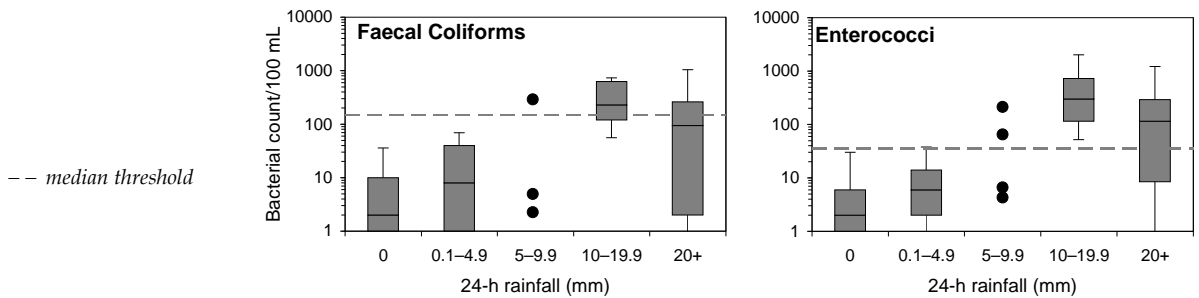
Compliance

Faecal coliform compliance ranged from 90% to 100% over the last five years. Enterococci compliance has been more varied, ranging from 64% to 100% over the last five years.



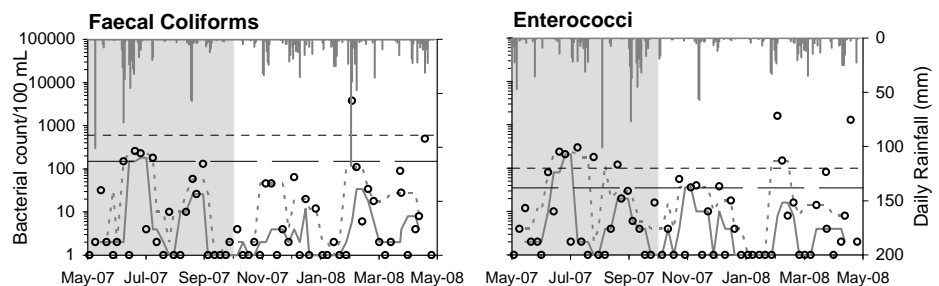
Response to rainfall

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 80th percentile
- Guidelines (see page 7 for details)
- median threshold
 - 80th percentile threshold



Winji Jimmi Bay

See page 186 for key to map

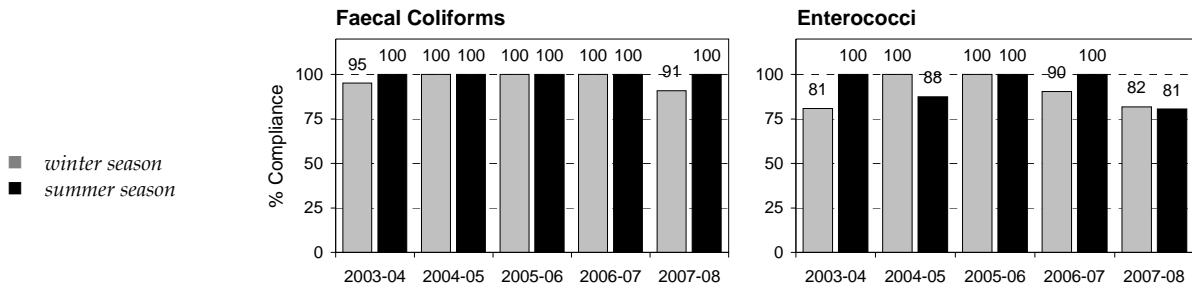
Description Winji Jimmi Bay is a poorly flushed swimming area in the south-eastern corner of Pittwater. It is backed by a grassy park in which a dog exercise area is located.

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.

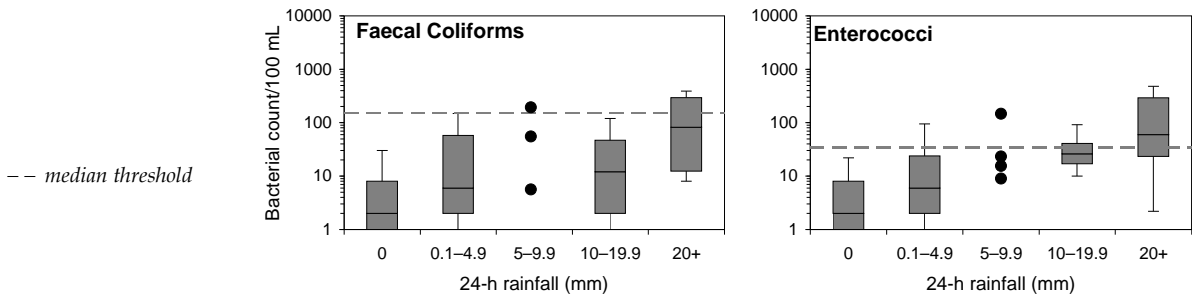
Actions Regeneration work is continuing in the Winnererremy Bay area to restore saltmarsh and bushland habitats. Visitor facilities within Rowland Reserve are being upgraded.



Compliance Over the last five years faecal coliform compliance with swimming guidelines has ranged from 91% to 100%. Enterococci compliance with swimming guidelines has ranged from 81% to 100% over the last five years.

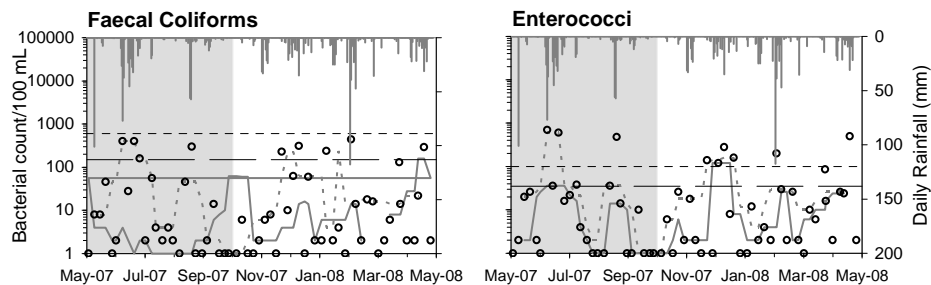


Response to rainfall Faecal coliform and enterococci levels generally increased with increasing rainfall. Faecal coliform densities often exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline 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 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - - - 80th percentile threshold



Bayview Baths

See page 186 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.



Pollution sources

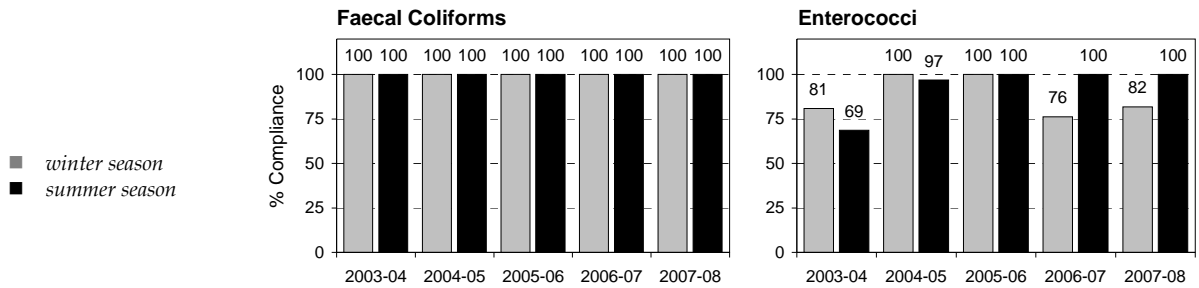
A stormwater drain discharges directly alongside the baths and a sewage overflow structure is located in the vicinity of the baths.

Actions

There are no actions specific to this swimming site.

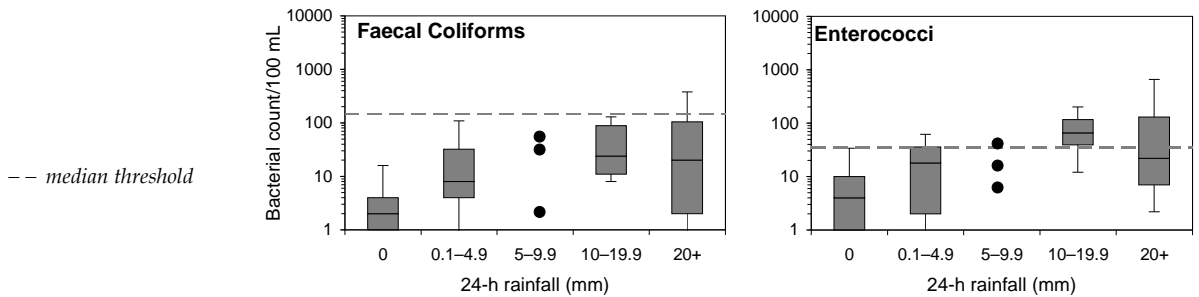
Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance has been more varied, ranging from 69% to 100% over the last five years.



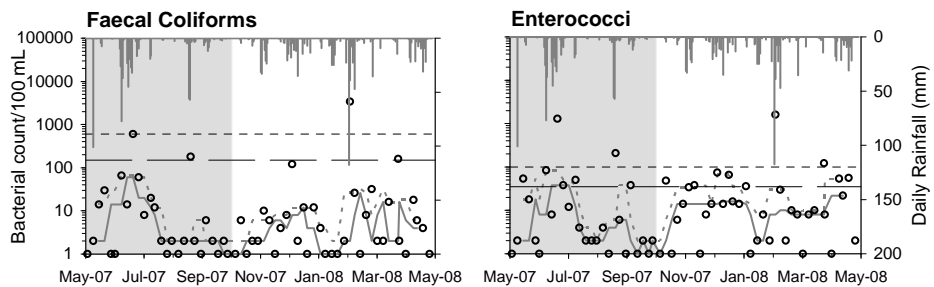
Response to rainfall

Bacterial densities generally increased with increasing rainfall. Faecal coliform levels occasionally exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours. Enterococci levels occasionally exceeded the median guideline limit after light rain and frequently 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 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - 80th percentile threshold



North Scotland Island

See page 186 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

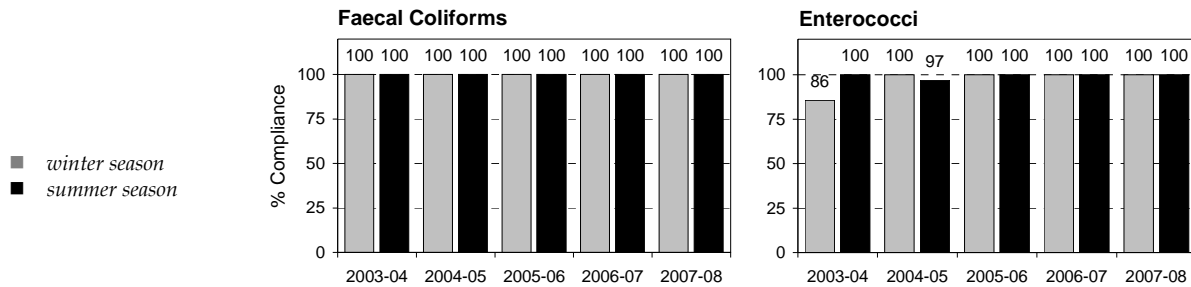
Septic tank seepage and runoff in wet weather from residential properties are potential sources. An open stormwater drain discharges in the vicinity of the sampling site.

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.

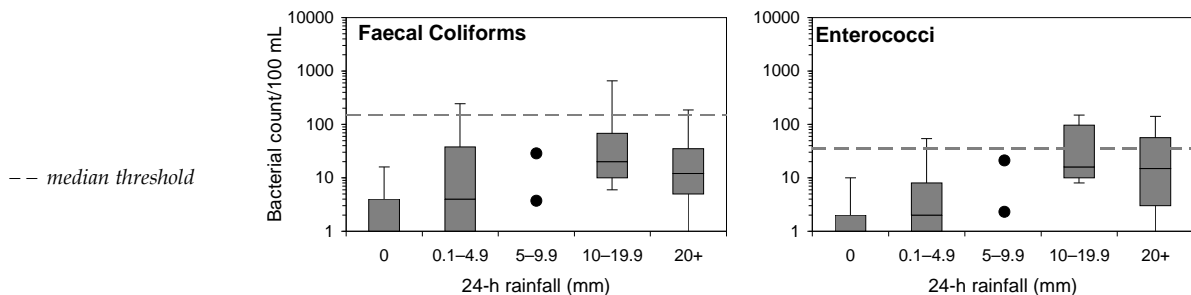
Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance has also been high, with 100% recorded in all but two seasons over the last five years.



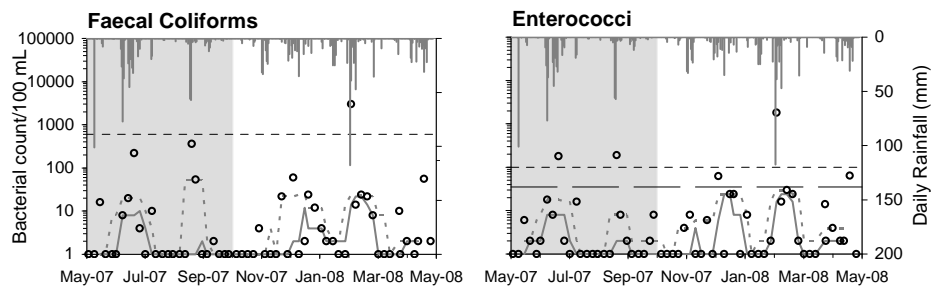
Response to rainfall

Bacterial densities generally increased with increasing rainfall. Faecal coliform densities occasionally exceeded the median guideline limit after light rain in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit after light rain and 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 80th percentile
- Guidelines (see page 7 for details)
- median threshold
 - 80th percentile threshold



South Scotland Island

See page 186 for key to map

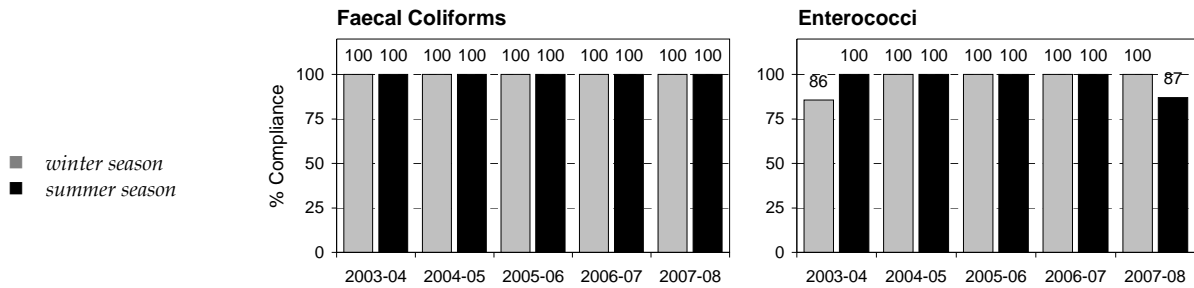
Description The South Scotland Island monitoring site is located at Carols Wharf, an unnetted swimming area located on the south side of Scotland Island. A reserve backs the swimming area.



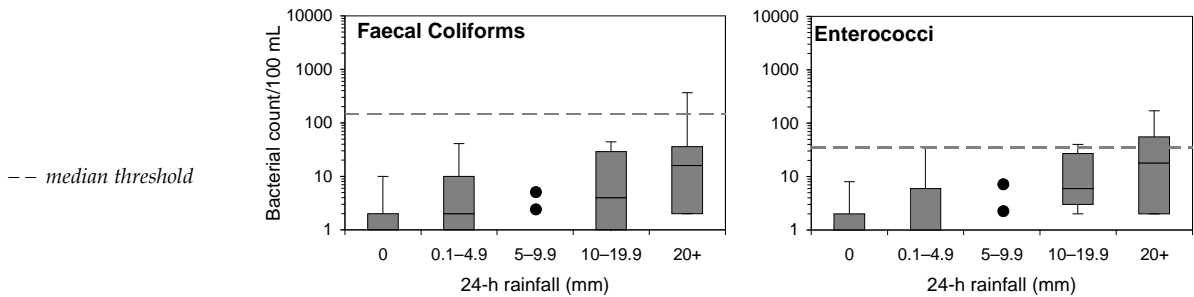
Pollution sources Septic tank seepage and runoff occur in wet weather from residential properties.

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. Enterococci compliance with swimming guidelines varied, ranging from 86% to 100% 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 20 millimetres of rain or more in the previous 24 hours. Enterococci densities occasionally exceeded the median guideline limit after light rain and often exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours.

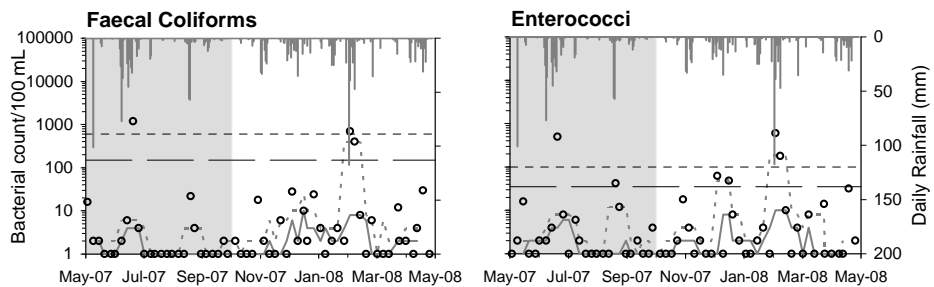


Season data

- | rainfall
- o individual result
- rolling median
- rolling 80th percentile

Guidelines
(see page 7 for details)

- median threshold
- 80th percentile threshold



Elvina Bay

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.

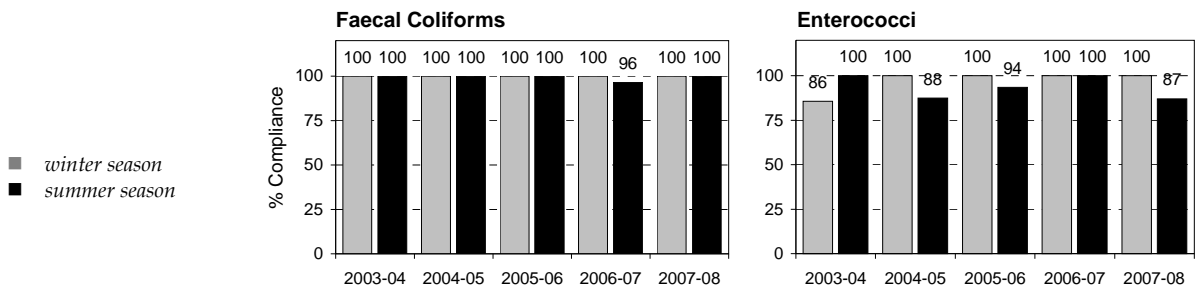
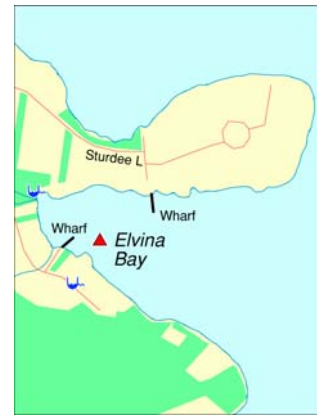
Actions

There are no actions specific to this swimming site.

Compliance

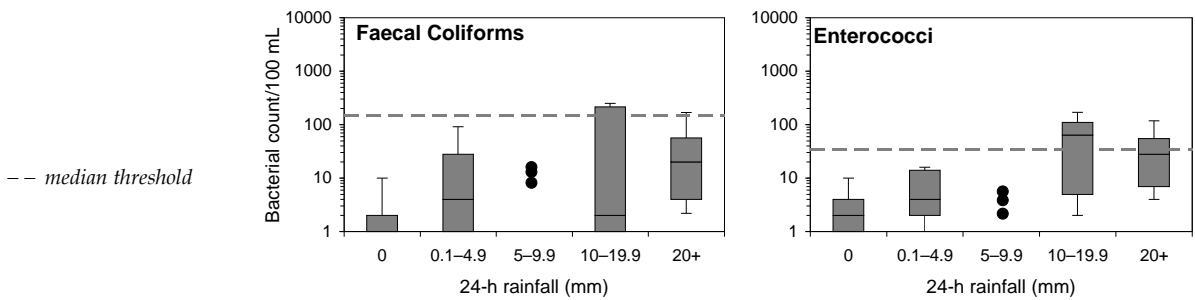
With the exception of summer 2006–2007, faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. Enterococci compliance has also been high, ranging between 86% and 100% over the last five years.

See page 186 for key to map



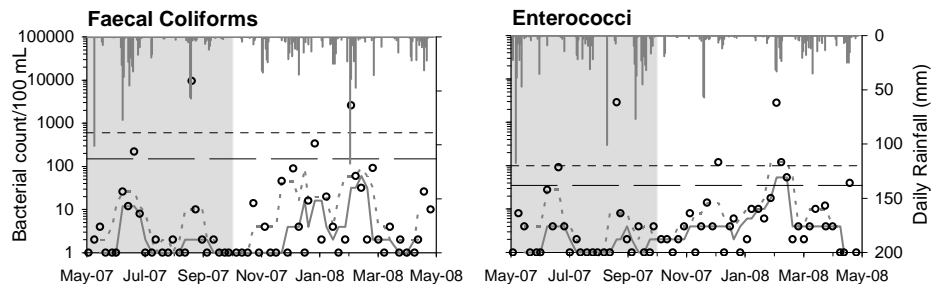
Response to rainfall

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 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - 80th percentile threshold



The Basin

See page 186 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

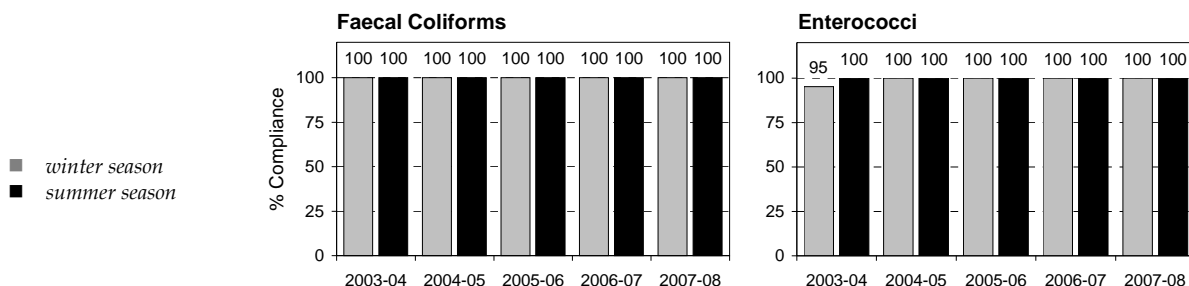
Heavy boat traffic at holiday times may result in poor water quality from illegal discharge of boat effluent.

Actions

There are no actions specific to this swimming site.

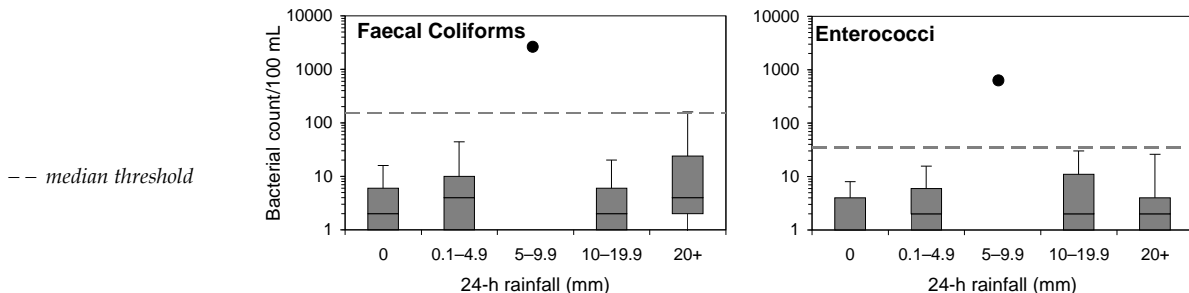
Compliance

Faecal coliform levels complied with swimming guidelines 100% of the time over the last five years. With the exception of winter 2003–2004, enterococci levels complied with swimming guidelines 100% of the time over the last five years.



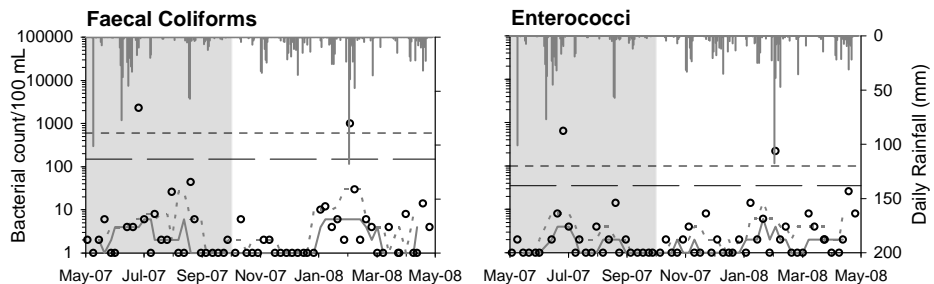
Response to rainfall

Bacterial densities increased slightly with increasing rainfall. Faecal coliform densities occasionally exceeded the median guideline limit in response to 20 millimetres of rain or more in the previous 24 hours. Enterococci densities generally remained below the median guideline limit across all rainfall categories.



Season data

- | rainfall
 - o individual result
 - rolling median
 - - - rolling 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - - - 80th percentile threshold



Great Mackerel Beach

See page 186 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

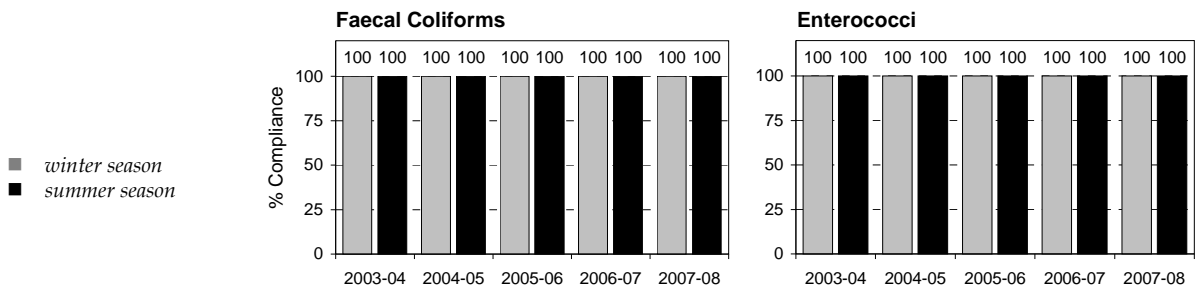
Runoff from the residential area during rain may be a source of pollution.

Actions

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

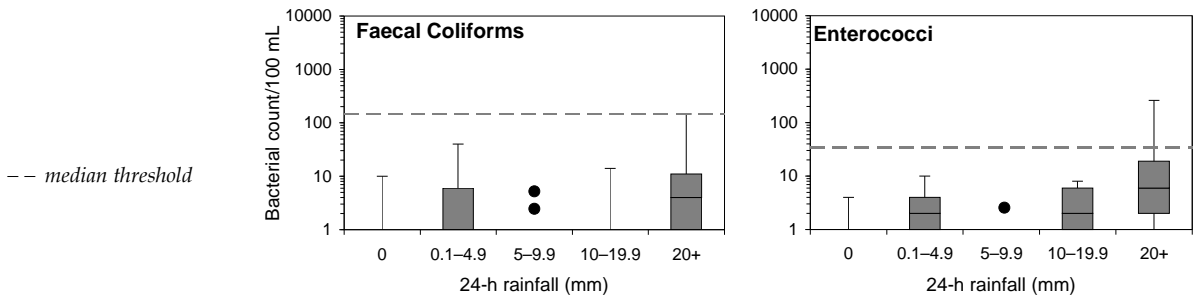
Compliance

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



Response to rainfall

Bacterial densities showed a slight response to increasing rainfall. Faecal coliforms and enterococci densities occasionally exceeded the median guideline limits in response to 20 millimetres of rain or more in the previous 24 hours.



Season data

- | rainfall
 - o individual result
 - rolling median
 - - - rolling 80th percentile
- Guidelines
(see page 7 for details)
- median threshold
 - - - 80th percentile threshold

