

# Recreational Water Quality Annual Monitoring Summary

December 2010 to March 2011



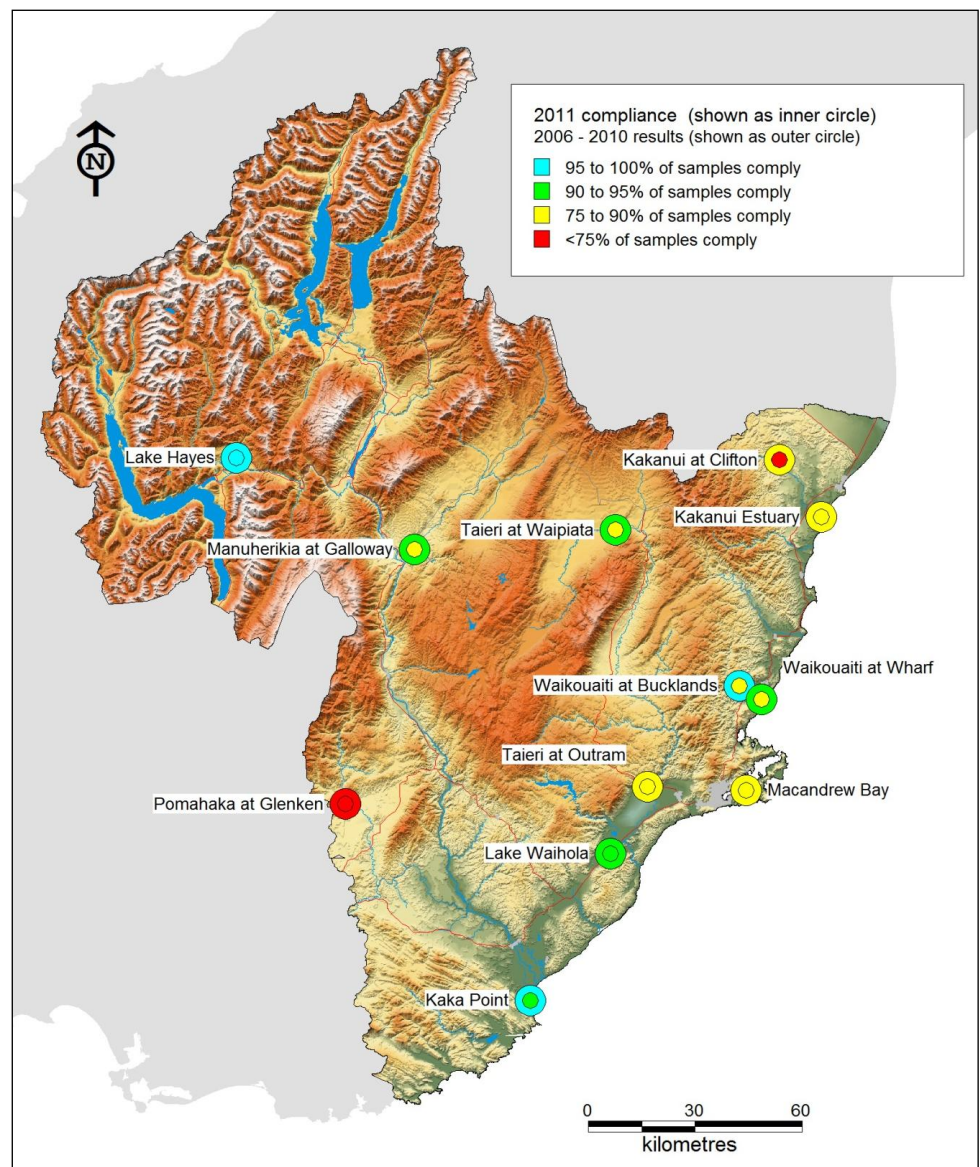
## How we monitor water quality

Each summer between December and March, Otago Regional Council (ORC) monitors the water quality at popular marine and freshwater bathing sites.

Water samples are typically taken once a week over the summer and tested for the concentration of indicator bacteria (*Escherichia coli* in freshwater and *Enterococci* in salty water). These bacteria, while generally not harmful themselves, indicate the presence of faecal material and disease-causing organisms.

### Key points

- Marine water sites complied with guideline values in 88% of all samples (89% in 2009/10).
- Freshwater sites complied with guideline values in 81% of all samples (82% in 2009/10).
- Five sites show 2010/11 had poorer water quality than the previous five year mean. This is likely to be due to 2010/11 being a wet summer.



## Why we monitor water quality

Micro-organisms such as viruses, bacteria and protozoa, are present in all natural water bodies. Water contaminated by faecal micro-organisms may pose a human health hazard, particularly if swallowed. Everybody can be affected, but small children, the elderly and people already weakened by illness or fatigue are more likely to become ill from exposure to contaminated water.

In most cases the health effects of exposure to contaminated water are minor and short-lived. The most common illnesses are those of the gastric-intestinal system, leading to symptoms like diarrhoea or vomiting, and infections of the eye, ear, nose and throat. However, there are other, potentially more harmful diseases such as giardiasis, cryptosporidiosis, campylobacteriosis and salmonellosis. Hepatitis A can be contracted from contaminants in the water and can lead to long-term health problems.

Testing the water regularly for indicator bacteria and posting results on the ORC website helps the public make informed decisions about whether to enter the water.

## Guidelines for contact recreation

### Fresh and marine Waters:

Water quality safety is assessed and reported according to the Ministry for the Environment (MfE) and Ministry of Health (MoH) Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas (also known as the guidelines for contact recreation).

The guidelines recommend a three-tier (traffic-light) management framework according to single sample results of *E. coli* (freshwater) and *Enterococci* (marine water) bacterial counts. These categories are given below:

| Mode                   | Safe for swimming?                  | Freshwater ( <i>E.coli</i> /100ml)    | Marine ( <i>Enterococci</i> /100ml)             |
|------------------------|-------------------------------------|---------------------------------------|---|
| Surveillance/<br>green | Should be very safe for swimming    | No single sample greater than 260     | No single sample greater than 140               |
| Alert/amber            | Should be satisfactory for swimming | One single sample between 261 and 550 | One single sample between 141 and 280           |
| Action/red             | Could be a health-risk for swimming | One single sample greater than 550    | Two consecutive single samples greater than 280 |

In this report the *E. coli* results are compared to the 'action' threshold of 550 *E. coli* per 100ml of water and the *Enterococci* results are compared to the 'action' threshold of 280 enterococci per 100ml of water. The higher the number of samples taken over a bathing season that comply with guidelines, the better the water quality.

### Recreational shellfish gathering:

The guideline for water quality is that the median faecal coliform result from samples taken over the season shall not exceed 14 faecal coliforms/100ml and not more than 10% of samples should exceed 43 faecal coliforms/100ml.

## Water quality results

### Marine waters

In the summer of 2010 to 2011, estuary/marine water quality was sampled a total of 64 times. Of these, seven results did not meet guideline levels. Five of these exceedences coincided with rainfall events. These events are shown in the table opposite.

| Location           | Date        | Rainfall (48hr) |
|--------------------|-------------|-----------------|
| Waikouaiti Estuary | 6 December  | 6mm             |
| Kakanui Estuary    | 29 December | 41mm            |
| Macandrew Bay      | 6 January   | 9mm             |
| Kaka Point         | 7 February  | 54mm            |
| Waikouaiti Estuary | 9 February  | 45mm            |

The other two exceedences at McAndrew Bay were not related to rainfall events (22 December and 12 January).

### Freshwater bathing sites

There were 128 samples taken at freshwater sites and of these the MfE/MoH bathing guideline was exceeded on 23 occasions.

The exceedences are listed in the table opposite. It can be seen that microbiological water quality on 14 occasions was compromised following rainfall (i.e. >10mm in previous 48hrs).

Of the other nine exceedences, on three occasions there had been no rainfall. This occurred twice at the Kakanui at Clifton Falls (11 January and 26 January) and once at the Taieri at Waipiata (22 February).

Of the six exceedences not discussed, all had received some rainfall in the previous 48hrs, however flows were not elevated. The Kakanui at Clifton exceeded guidelines twice (6 January with 5mm rain and 19 January with 7mm rain). The Manuherikia at Galloway (6 December, 5mm), Taieri at Waipiata (8 February, 1mm) and Pomahaka at Glenken (15 February, 4mm) and Kakanui at Clifton (1 February, 5mm).

The other 105 samples had bacteria concentrations below the guideline value and a high level of water quality.

| Location                | Date           | Result | Rainfall (48hrs) |
|-------------------------|----------------|--------|------------------|
| Manuherikia at Galloway | 6 December     | 580    | 5                |
| Kakanui at Clifton      | 29 December    | 1600   | 41               |
| Taieri at Waipiata      |                | 2040   | 45               |
| Taieri at Outram        |                | 2880   | 62               |
| Waikouaiti at Bucklands |                | 3480   | 52               |
| Manuherikia at Galloway |                | 4800   | 73               |
| Kakanui at Clifton      | 5-6 January    | 4480   | 9                |
| Pomahaka at Glenken     |                | 780    | 26               |
| Kakanui at Clifton      | 11 January     | 600    | 0                |
| Kakanui at Clifton      | 19 -20 January | 2280   | 7                |
| Kakanui at Clifton      | 26-27 January  | 580    | 0                |
| Kakanui at Clifton      | 1-2 February   | 920    | 5                |
| Taieri at Outram        |                | 2880   | 12               |
| Pomahaka at Glenken     |                | 7000   | 31               |
| Taieri at Waipiata      | 7-9 February   | 2060   | 1                |
| Taieri at Outram        |                | 11600  | 72               |
| Waikouaiti at Bucklands |                | 2280   | 45               |
| Manuherikia at Galloway |                | 2800   | 83               |
| Lake Waihola            | 920            | 72     |                  |
| Taieri at Outram        | 15 February    | 720    | 14               |
| Pomahaka at Glenken     |                | 1500   | 4                |
| Taieri at Waipiata      | 22 February    | 5060   | 0                |
| Pomahaka at Glenken     | 24 February    | 900    | 10               |

### Water quality for recreational shellfish gathering

In addition to the recreational bathing water sampling, the marine sites were monitored to assess their suitability for shellfish gathering.

Kaka Point and the Waikouaiti Estuary complied with the guidelines. The seasonal median was less than 14 faecal coliforms/100ml and fewer than 10% of the results exceeded 43 faecal coliforms/100ml.

| Site                         | Median faecal coliform result/100ml | Percent of results >43/100ml |
|------------------------------|-------------------------------------|------------------------------|
| Pacific Ocean: Kaka Point    | 7                                   | 7                            |
| Otago Harbour: Macandrew Bay | 33.5                                | 43                           |
| Waikouaiti Estuary at Wharf  | 9                                   | 8                            |

Macandrew Bay had a seasonal median of 33 faecal coliforms/100ml and 43% of results exceeded 43 faecal coliforms/100ml.

## What do the results mean?

Recreational water quality at monitored coastal sites met the guidelines for contact recreation on 88% of sampling occasions (89% in 2009/2010), while those at freshwater sites met the guidelines on 81% of sampling occasions (82% in 2009/2010)

Recreational water quality can vary enormously depending on the weather. For example, during a wet summer such as in 2010 to 2011 more faecal matter is carried from the land into rivers and estuaries. Therefore, bacteria levels in the water during wet summers are often high when compared with dry summers. The exceedences during the summer of 2010/2011 were generally related to rainfall events.

Coastal beaches generally have lower levels of bacteria than freshwater swimming spots. This is largely because faecal matter is more rapidly diluted and dispersed by ocean currents and large volumes of water at the coast.



Top photo Kakanui River at Clifton Falls, bottom photo Waikouaiti Estuary

### How do you know if it's safe to swim?

Before heading out, check the recreational water monitoring section of the ORC website [www.orc.govt.nz](http://www.orc.govt.nz)

This will tell you whether the water was suitable for swimming the last time it was tested and the typical water quality of the site.

Avoid swimming and collecting shellfish during heavy rain and for up to two days afterwards.

For information on the water quality of Dunedin city beaches, check out the Dunedin City Council website [www.dcc.govt.nz](http://www.dcc.govt.nz)