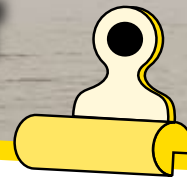




# THE COAST



## Coastal water quality

**W**ater quality at the beautiful beaches of Gisborne and the East Coast is highly important to visitors and local residents alike.

The Gisborne District Council monitors water for what are known as 'indicator' bacteria, against criteria set out by the Ministry for Health and the Ministry for the Environment. Different criteria apply depending on the likely use of the area, whether for bathing and watersports, or shellfish gathering.

Council staff monitor coastal water for *enterococci* at 29 popular on- and off-shore sites used for swimming and recreation. Water samples are tested twice a month during the summer bathing season (November to March), and monthly for the remainder of the year. There is a single-sample limit of 280 *enterococci* per 100ml in water used for bathing.

In the calendar years 2005 and 2006, 7 out of 8 of the district's monitored bathing beaches graded 'very good', and Waikanae Beach graded 'good'.

In 2005 a non-complying sample was collected at Waikanae Beach after a rain event, when increased stormwater runoff flushes bacteria and contaminants into water. This result is unsurprising, and consistent with what we have observed in previous years.



Above: Turihaua Lagoon is popular with children and is monitored by the Gisborne District Council during the summer months.

recreational and shellfish gathering sites: Tolaga Bay wharf, Pouawa, Sponge Bay, offshore Sponge Bay, Kaiti Beach outfall, Kaiti Yacht Club and Wherowhero Lagoon.

Indicator bacteria (faecal *coliforms*) are counted in the water samples. These organisms are present in the gut of both animals and humans. If detected in seawater, it is an indication that other pathogenic (disease causing) bacteria could also be present.

Two water-quality parameters are monitored year-round at shellfish-gathering sites to determine the seasonal-median faecal *coliform* content of water samples (which should not exceed 14 faecal *coliforms* per 100ml). In addition, not more than 10% of samples should exceed 43 faecal *coliforms* per 100ml.

### Principal findings

- Beaches of Gisborne and the East Coast are generally safe for swimming, except after heavy rainfall, when storm runoff carries bacteria into the sea
- Water in close proximity to the city outfall is not safe for recreation, but this is a localised effect
- Shellfish may contain unsafe levels of bacteria after a heavy rainfall event
- A local Aquaculture Forum has been set up, and Aquaculture Management Areas could be designated in the future, if there is interest from industry in setting up marine farms in this region
- A staged upgrade of the city wastewater system has been recommended by WARG, the Wastewater Adjournment Review Group. Recommendations include biological trickling filters, UV disinfection of the runoff and investigation into possible future alternatives to the ocean outfall
- Rubbish and recyclables collections from freedom camping areas have addressed many environmental concerns
- A detailed report on climate change consequences for Gisborne has highlighted the possibility of coastal erosion and inundation.

In addition, three popular coastal fresh-water bathing sites are also monitored, just during the summer months. The sites are Anaura Bay Lagoon/Stream, the Hamanatua River at Okitu Lagoon and Turihaua Lagoon.

It is unsurprising that at these three sites highly elevated levels of bacteria were recorded following rainfall in their catchments, at various times between November 2005 and March 2006.

### Water quality for shellfish-gathering

Shellfish that filter the water in the process of feeding, such as cockles, mussels and pipis, may potentially concentrate bacteria present in the surrounding water. Some bacteria have the potential to make people sick. This does not apply to paua and kina, since they are grazers.

The Council's surveillance programme focuses on seven

### Bathing beaches - Water quality results

	Grading	2005 sample compliance*		2006 sample compliance*	
		All year	Bathing season	All year	Bathing season
<b>Wainui Beach</b>	Very good	16 of 16**	10 of 10	17 of 17	11 of 11
<b>Sponge Bay</b>	Very good	16 of 16	9 of 9	17 of 17	10 of 10
<b>Kaiti Beach</b>	Very good	16 of 16	10 of 10	17 of 17	10 of 10
<b>Waikanae Beach</b>	Good	14 of 15	9 of 10	18 of 18	10 of 10
<b>Midway Beach</b>	Very good	16 of 16	10 of 10	17 of 17	11 of 11
<b>Abattoir Beach</b>	Very good	16 of 16	10 of 10	17 of 17	11 of 11
<b>Paokahu Beach</b>	Very good	16 of 16	10 of 10	17 of 17	11 of 11
<b>Browns Beach</b>	Very good	17 of 17	11 of 11	17 of 17	11 of 11

\*MoH single-sample limit of 280 enterococci per 100ml

\*\*Results are displayed as number of complying samples out of total number of samples taken.



Above: Kaiti Beach - one of Gisborne's popular city beaches - complied with bathing water guidelines throughout 05-06.

The apparently poor results for Tolaga Bay wharf are a consequence of the low sampling frequency during this reporting period, and are misleading. The southern end of Kaiti Beach recorded non-complying results due to frequent rainfall through out 2005 and 2006. Results for Wherowhero Lagoon are consistent with previous years: adjacent farming is intensive and there are two streams entering the lagoon. These are the probable sources of contamination.

### Marine biotoxins

Algal blooms can also pose a health risk to people consuming shellfish, such as paralytic shellfish poisoning. Biotxin monitoring is the responsibility of the Public Health Unit. During this reporting period all sample sites were clear of marine biotoxins.

### Offshore water quality – Poverty Bay

Five offshore sites are monitored within Poverty Bay to give a general representation of water quality in the bay away from such influences as the rivers and the city outfall mixing-zone.

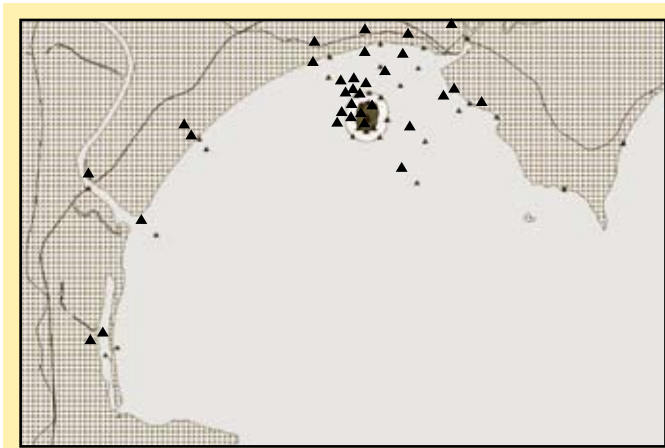
Poverty Bay water quality ranged from good to very good. A single sample at one location did not comply with the MoH guidelines/ single sample limit of 280 *enterococci* per 100ml.

Offshore water quality is also monitored at six sites at a radius of 250 metres, and five sites at 500 metres from the city outfall diffuser. Monitoring is undertaken twice monthly during the bathing season (November to March inclusive) and monthly for the remainder of the year.

Water sampled at the 500m radius consistently complied with the single-sample limit, meaning samples contained fewer than 280 *coliforms* per 100ml, and therefore met bathing-water guidelines.

The non-complying samples obtained at the 250m radius are probably directly attributable to the outfall.

### Poverty Bay water quality sample locations



### Shellfish areas monitoring results 2005 – 2006<sup>1</sup>

Site	No. samples <sup>2</sup> 04-05 / 05-06		Median no. faecal coliforms/ 100ml <sup>3</sup> 04-05 / 05-06		% of samples exceeding 43 coliforms/100ml <sup>4</sup> 04-05 / 05-06	
Tolaga Bay, end of wharf <sup>5</sup>	8	3	127 ✗	124 ✗	13 ✗	67 ✗
Pouawa Beach	10	23	22 ✗	7 ✓	10 ✓	4 ✓
Sponge Bay Beach	10	23	7 ✓	11 ✓	0 ✓	9 ✓
Sponge Bay, offshore	10	23	11 ✓	10 ✓	10 ✓	9 ✓
Kaiti Beach, southern end	10	23	31 ✗	42 ✗	20 ✗	26 ✗
Kaiti Beach, Yacht Club	10	23	9 ✓	39 ✗	10 ✓	13 ✗
Wherowhero Lagoon	10	23	20 ✗	40 ✗	10 ✓	22 ✗

✓ Complies with criterion    ✗ Non-complying  
 1. Monitoring period for these areas is April to March, therefore these results cover the period April 2004 to March 2006. The remainder of 2006 results will be included in the next State of Environment report.  
 2. Note that sampling frequency was increased from 2004/05 onwards.  
 3. The median results should not exceed 14 faecal *coliforms* per 100ml.  
 4. Not more than 10% of samples should exceed 43 faecal *coliforms* per 100ml  
 5. Note that fewer samples were collected at Tolaga wharf, due to wharf closure for renovations, and a disproportionate number of samples were collected after heavy rain. These results are therefore somewhat misleading; in previous years this site has achieved compliance.

### Poverty Bay offshore water quality monitoring results

	2005 sample compliance*		2006 sample compliance*	
	All year	Bathing season	All year	Bathing season
Paokahu offshore	17 of 17**	10 of 10	16 of 16	10 of 10
Abattoir offshore	17 of 17	10 of 10	15 of 16	9 of 10
Midway offshore	17 of 17	10 of 10	16 of 16	10 of 10
Turanganui offshore	17 of 17	10 of 10	16 of 16	10 of 10
Windsurfing lane	17 of 17	10 of 10	16 of 16	10 of 10
Outer Bay	17 of 17	10 of 10	16 of 16	10 of 10

\*MoH single-sample limit of 280 enterococci per 100ml  
 \*\*Results are displayed as number of complying samples out of total number of samples taken.

### Outfall monitoring results

Site/ Location	2005 sample compliance*		2006 sample compliance*	
	All year	Bathing season	All year	Bathing season
<b>Sample sites 250 m from outfall diffuser</b>				
NW	15 of 16**	8 of 9	14 of 15	9 of 10
N	17 of 18	11 of 11	14 of 15	9 of 10
NE	14 of 15	8 of 8	16 of 17	10 of 11
SW	13 of 17	9 of 10	14 of 15	9 of 10
S	13 of 17	9 of 10	15 of 15	10 of 10
SE	13 of 17	8 of 10	13 of 15	9 of 10
<b>Sample sites 500 m from outfall diffuser</b>				
NW	17 of 17	10 of 10	15 of 15	10 of 10
N	17 of 17	10 of 10	15 of 15	10 of 10
NE	17 of 17	10 of 10	15 of 15	10 of 10
SW	17 of 17	10 of 10	15 of 15	10 of 10
SE	17 of 17	10 of 10	15 of 15	10 of 10

\*MoH single-sample limit of 280 enterococci per 100ml  
 \*\*Results displayed as number of complying samples out of total number of samples taken.

## Gisborne City wastewater upgrade

Applications for new resource consents for the discharge of wastewater via the city outfall were lodged in September 2005, and the existing discharge permit expired on 31 December 2005. There were a number of submissions expressing opposition to ongoing use of the city outfall, and frustration at the lack of cultural considerations with regard to discharge of human waste to the ocean.

Such a significant resource consent application within the coastal marine area is deemed a Restricted Coastal Activity, and is ultimately determined by the Minister of Conservation. Since the Council is both the applicant and the consent-issuing authority, hearings are heard by independent commissioners, including one appointed by the Minister of Conservation.

Since previous hearings on the city wastewater had been confrontational a fresh approach to the issue was needed. Council staff and key submitters had a series of meetings to identify common ground and to inspect some wastewater treatment processes in other regions. These included a treatment process at Tauranga, similar to that what Council had proposed for Gisborne, land-disposal of treated effluent to forests at Rotorua and to pasture (Taupo), and a biological trickling filter trial at Hastings.

Tangata whenua expressed interest in the biological trickling filter and to allow further investigation of this system, commissioners adjourned the hearing of April 2006.

The Wastewater Adjournment Review Group (WARG) was set up to progress this task, and Council employed the services of Mr. Jim Bradley, a wastewater engineer, who had been involved in developing the Hastings option.

Biological trickling filters are not a new technology, having been used as a secondary wastewater treatment option for over a century. What is new is the use of this technology as a primary treatment and at a low loading, allowing human waste to be transformed by natural processes to plant matter.

The WARG provided a series of recommendations to Council and the commissioners.

The biological trickling filter is proposed as the initial stage, to be commissioned by the end of 2010. Further treatment to reduce contaminant concentrations and enhance the effect of ultraviolet disinfection is programmed by the end of 2012. Once UV disinfection is up and running, outfall-monitoring should result in compliance with bathing water standards virtually all the time, even at the 250m sampling radius.

The proposed site for the wastewater treatment plant is on the northwestern side of the airport runway.

As a condition of the discharge consent, alternatives to ongoing use of the ocean outfall are to be investigated.

## Aquaculture – the current snapshot

In the latter part of 2006, Council became aware of renewed interest in pursuing aquaculture, or marine farming. Mayor of Gisborne District, Meng Foon, has initiated a regular Aquaculture Forum to discuss aquaculture opportunities further.

There are currently no coastal permits or Aquaculture Management Areas defined within the coastal marine area off the coast of Gisborne District.

Council did receive an application back in 2001 for a large submerged mussel installation. Council requested further information from the applicant to allow assessment of the application, however in November 2001 the government placed a moratorium on marine farming applications.

Effectively, applications were frozen nationwide, to be assessed under new legislation.

## National aquaculture reforms

The moratorium was imposed due to:

- concerns that the effects of aquaculture were not fully understood
- the delays and uncertainty of separate resource consent and fisheries-permit processes, and
- the huge upsurge in demand for coastal space.

New legislation was enacted. Firstly, the Aquaculture Reform Act 2004, which provided for the transition of existing aquaculture activities into the new regime.

The Maori Commercial Aquaculture Settlement Act 2004 provided for 20% of existing aquaculture space in the coastal marine area and 20% of all new aquaculture space in the coastal marine area to be transferred to Maori.

Changes introduced via the 2005 Resource Management Act Amendment, provided for allocation of space for Aquaculture Management Areas, and associated Plan changes.

For aquaculture to occur, it is now necessary to first have Aquaculture Management Areas (AMAs) defined within the Regional Coastal Environment Plan. These areas are set aside for aquaculture. There are several planning options available to establish such areas.

The AMA process provides:

- A single, robust process for the creation of AMAs
- Clear direction for local councils on managing all environmental effects including potential effects on recreational fishing
- For potential effects on commercial fishing to be taken into account by way of a test for 'undue adverse effects on fishing' by the Ministry of Fisheries.

Once a new AMA has been defined within a Regional Coastal Environment Plan, any applicant wishing to develop an aquaculture venture would then apply for a resource consent along with registration as a marine farmer.

## The local situation

The necessary Plan changes, to allow for creation of AMAs, would be initiated only if the aquaculture industry demonstrated a firmer commitment.

In the mean time, the local Aquaculture Forum will continue, and Council staff will report regularly on key issues including environmental effects and the feasibility of allocating space in the coastal marine area.

Council staff have sought estimates from a number of research providers to identify areas where aquaculture might be feasible, and to investigate physical constraints, economic and social effects of aquaculture in this district. Progressing these matters is dependent on commitment from the aquaculture industry.

Should you wish to obtain further information with regard to aquaculture, contact Kerry Hudson, Water Resources Section of the Gisborne District Council, [kerryh@gdc.govt.nz](mailto:kerryh@gdc.govt.nz) or (06)867 2049, extension 7339.

## Sea level rise

Sea level was measured very accurately at Gisborne Harbour by the Lands and Survey Department in 1926, and again in 1990 by the Department of Survey and Land Information.

The measured net sea level rise of 2.3mm per annum equates to sea level rise of 11.5cm in 50 years at Gisborne, and this has already had a significant effect on the coastline.

The rate of sea level rise may accelerate; current climate change models predict the rise could be 30 to 50cm.



## Flood risk

Coastal areas may become more vulnerable to flooding for five reasons:

1. A higher sea level provides a higher base for storm surges to build upon, for instance a one-metre rise in sea level would enable a “one-in-15-year” storm to inundate many areas that today would only be flooded by a “one-in-100-year” storm.
2. Rivers would ‘back up’ to a greater extent during rainstorms.
3. Beach erosion will make some areas of the coast more vulnerable to storm waves.
4. Higher water levels would increase flooding due to rainstorms by reducing coastal drainage.
5. A rise in sea level raises water tables.

## Storm surges

A storm surge is water pushed against the shore by the force of the winds swirling around a storm. The surge combines with the normal high tide to increase the mean water level by a metre above the expected high tide (or possibly higher).

Wind-generated waves are superimposed on top of the storm surge. The total rise in water level could be 3 metres (or more), and may overtop dunes, causing severe damage to the foreshore and flooding coastal areas.

Much of Gisborne (including Wainui and the airport) is below 4 to 5 m above sea level now.



## Coastal erosion

Erosion scenarios for Gisborne coastal areas include:

1. Shoreline retreat and lateral loss of land: This is the likely consequence for our open-coast sandy beaches. Sandy beaches would still exist where retreat is allowed to happen naturally, without placement of protection works.
2. Loss of beach volume: Sand may be lost offshore (or along the shore) due to changes in currents, erosion of headlands formerly protecting the beach, or reduction in sand source. The problem is exacerbated by construction of sea walls, forcing the sea to cut downward, rather than allowing sediment to be taken from the dunes.
3. Cliff erosion: The process of cliff erosion includes frittering (small pieces shattering off), undermining and slumping (for instance at Tatapouri).

## Coastal structures and assets at risk

At-risk are natural fore-dunes on erosion-prone stretches of coast, and the existing beach protection works at Wainui.



Above: The sea has undermined the far end of Kaiti Beach Road, and this section is permanently closed.

## Freedom camping

The East Coast is one of very few areas in New Zealand where summer freedom camping is still permitted on reserve land at Turihaua, Pouawa, Loisel's Beach, Kaiawa at Tolaga Bay, Tokomaru Bay and Waipiro Bay. Freedom camping is also allowed (inland) at Doneraille Park.

Camping at the beach is an annual tradition for many local families and visitors alike, and most people acknowledge it is a privilege to have the opportunity. However, the impacts on the coastal environment, in the form of rubbish and effluent, can be significant.

The freedom camping season extends from Labour weekend until Easter (however a shorter season applies at Turihaua). A first for the 2005-2006 season was the introduction of a compulsory fee: \$25 per four people, allowing up to a 28-day stay. This was to cover the cost of organised collection and disposal of rubbish.

Each campsite was issued with rubbish and recycling bags and a contractor provided twice-weekly collection during the off-peak season and thrice-weekly for the period 16th of December through to the end of January.

Each family or group is required to use their own chemical toilet. Effluent tanks, placed at the popular camping spots, were emptied frequently during peak times and regularly at off-peak times.

Most campers welcomed the changes, appreciated the rubbish and effluent collections, and felt the \$25 fee was value for money. A small minority were reluctant to comply.

Changes from Labour weekend 2006 included the introduction of a lesser \$10 fee to cover four people for up to 7 nights (with 2 rubbish and 1 recycling bag provided). The \$25 fee (4 people and up to 28 nights) covered 5 rubbish and 3 recycling bags.

The rubbish contractor issued on-the-spot permits, handed out information pamphlets, and collected fees while on the round. This was convenient for campers and increased compliance.

The far end of Kaiti Beach Road has already been closed, due to being undermined by the sea. This will get worse and more of the road will need to be closed in the near future.

The Waima Road from the township of Tokomaru Bay to the old freezing works, and East Cape Road, are under threat from the sea.

State highway 35 at Tatapouri is being undermined, and together with the road at Pouawa will be increasingly threatened. The building and boat ramp belonging to the Tatapouri Fishing Club will be increasingly at risk.

## Accreting sections of the coast

Some areas of our coastline are currently accreting, or building out to sea. These areas coincide with the mouths of major rivers, due to the sediment delivered by those rivers. Accretion is likely to continue under moderate climate change scenarios, but the rate of accretion could change, depending on how rainfall and storm frequency affect sediment supply.

The Waipaoa River carries a very high sediment load in times of flood and will probably continue to supply sediment to the City and Poverty Bay beaches (free of charge!) for the foreseeable future.

For more information on the anticipated local effects of climate change see [www.gdc.govt.nz](http://www.gdc.govt.nz) click on Civil Defence, then on Climate Change Report, which appears on the right of the Civil Defence page.