



THE COAST

COASTAL WATER QUALITY

Gisborne and the East Coast are renowned for beautiful, golden and uncrowded beaches. The district boasts around 712 kilometres of coastline, and in general the water is as clean and pristine as it looks.

Coastal water quality is monitored for the indicator bacteria *enterococci* at 35 sites, including the popular bathing and recreational areas. Monitoring occurs twice a month during the bathing season (November to March inclusive) and then monthly for the remainder of the year. In 2003-04 Gisborne beaches were graded fair to very good against Ministry of Health/Ministry for the Environment guidelines, and were considered generally safe for swimming.

However, there are normally periods when, due to high rainfall and storm-water runoff, levels of bacteria in the water exceed the single-sample limit of 280 *enterococci* per 100ml. For the city beaches, the Turanganui River is the likely source of bacterial contamination.



Above: Matawai School children on a class visit to Te Tapuwau o Rongokako Marine Reserve.



Above: Dolphins are frequent visitors to Poverty Bay.

To determine the suitability of sites for shellfish gathering, faecal coliforms are counted. These organisms are found in the gut of animals and humans. Their presence in sea-water indicates the possibility that other pathogenic (disease-causing) organisms may also be present.

Seven recreational shellfish-gathering sites were monitored during 2003 and 2004: Tolaga Bay Wharf, Pouawa, Sponge Bay, offshore Sponge Bay, Kaiti Beach outfall, Kaiti Yacht Club and Wherowhero Lagoon.

Some sites where the potential for contamination is often present have permanent signs warning people that the shellfish collected from the area are not safe to eat. Two water-quality parameters are monitored at shellfish-gathering sites, to determine:

- The seasonal-median faecal-coliform content of water samples, which should not exceed 14/ per 100ml; and

Bathing beaches – water quality results

Beach	Grading	2003 sample compliance*		2004 sample compliance*	
		All Year	Bathing Season	All Year	Bathing Season
Wainui Beach	Good	17 of 17**	10 of 10	15 of 17	10 of 10
Sponge Bay	Good	17 of 17	10 of 10	15 of 17	9 of 10
Kaiti Beach at Yacht Club	Very Good	17 of 17	10 of 10	17 of 17	10 of 10
Waikanae Beach	Fair	17 of 17	10 of 10	15 of 17	9 of 10
Midway Beach	Good	17 of 17	10 of 10	15 of 17	9 of 10
Abattoir Beach	Good	17 of 17	10 of 10	16 of 17	10 of 10
Paokahu Beach	Fair	16 of 17	10 of 10	16 of 17	10 of 10
Browns Beach	Good	17 of 17	10 of 10	16 of 17	9 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.

Principal findings

- In general, Gisborne and East Coast beaches are safe for swimming, except when storm runoff carries silt and with it bacteria, into the sea;
- Water in close proximity to the city wastewater outfall is not safe for recreation, however the effect is localised;
- Shellfish are generally safe for human consumption, however they may contain unsafe levels of bacteria after heavy rainfall events;
- From mid-June to October 2003 the coastline was closed for shellfish gathering by the public health unit, due to paralytic shellfish poisoning toxin;
- Te Tapuwae o Rongokako Marine Reserve protects 2,450 hectares of marine and coastal environment;
- Freedom camping is hugely popular on the coast over the summer months, however there are environmental concerns;
- Climate change and sea level rise will result in the reshaping of our coastline over the next few centuries.

Water quality for shellfish-gathering

Water quality has implications for human consumption of bivalves – those shellfish that filter the water for food, such as cockles, mussels and pipis. If there are harmful bacteria in the water, they may become concentrated in the flesh of shellfish and may make people sick. Grazers such as paua and kina aren't filter feeders.

- Not more than 10% of the samples should exceed 43 faecal coliforms/ per 100ml.

Six out of seven sites complied with the seasonal-median criterion.

Pouawa complied with both criteria in 2003/04.

Wherowhero Lagoon has fluctuated in and out of seasonal-median compliance since monitoring began ten years ago. Wherowhero did not comply with sample-exceedence criteria, so overall did not comply with MAF/MoH Guidelines in 2004.

Periods of rainfall and surface run-off resulted in three sites in 2003 failing to comply with the sample-exceedence criteria, and five sites in 2004.





Above: Popular Wainui Beach, north of Gisborne, experienced 100% compliance with bathing water quality guidelines throughout the summers of 2003 and 2004.

Marine biotoxins

Algal blooms can also pose a significant health risk to recreational shellfish gatherers. Biotoxin monitoring is undertaken by the Public Health Unit of Tairāwhiti Health.

From the middle of June to early October 2003 the PHU closed the coastline for shellfish gathering from Whareongaonga to East Cape, due to unsafe levels of paralytic shellfish poisoning toxin. This affected all the Council's sampling sites. Signs were posted at each of the sites in conjunction with media releases warning people of the potential health risk.

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 waste water outfall.

Poverty Bay water quality ranged from fair to good and all complied with MoH guidelines/ single-sample limit of 280 *enterococci* per 100ml.

Offshore water quality has also been monitored at six sites 250 metres from the outfall diffuser for a number of years. In 2003 five additional monitoring sites 500 metres from the outfall were introduced. Monitoring is undertaken twice monthly during the bathing season (November to March inclusive) and monthly for the remainder of the year.

Waters sampled in 2003 at the 500m radius consistently complied with the single-sample limit of fewer than 280 *enterococci* per 100ml. In 2004, non-complaint samples coincided with rainfall and increased storm water runoff.

Waters 250m from the outfall are more likely to be contaminated, however non-complying samples can at times be attributed to rainfall events increasing storm runoff. One of the non-complying samples taken in 2003 and three in 2004 (at 250m S, SW and SE) were deemed to be directly attributable to the outfall.

Poverty Bay water quality sample locations



Shellfish monitoring results 2003 - 2004

Site	No. samples*		median faecal coliforms/100ml		% samples >43 coliforms/100ml	
	2003/2004		2003 / 2004		2003 / 2004	
Tolaga Bay, end of wharf	20	12	2 ✓	2 ✓	15 ×	8 ✓
Pouawa Beach	14	10	2 ✓	2 ✓	0 ✓	0 ✓
Sponge Bay Beach	22	17	2 ✓	5 ✓	9 ✓	12 ×
Sponge Bay, offshore	4	10	n/s**	2 ✓	n/s**	20 ×
Kaiti Beach, southern end	22	17	5.5 ✓	14 ✓	9 ✓	24 ×
Kaiti Beach, Yacht Club	22	17	6 ✓	8 ✓	18 ×	18 ×
Wherowhero Lagoon	18	17	11 ✓	36 ×	11 ×	41 ×

✓ Complies with criterion × Non-complying
 * Number of samples varies due to review of sampling frequencies. From 2004/05 all sites will be sampled consistently. **n/s - Not sufficient samples. Sponge Bay offshore site has been monitored since January 2003.

Poverty bay offshore water quality monitoring results

Site/location	2003 sample compliance*		2004 sample compliance*	
	All Year	Bathing Season	All Year	Bathing Season
Paokahu offshore	17 of 17**	10 of 10	16 of 17	10 of 10
Abattoir offshore	17 of 17	10 of 10	17 of 17	10 of 10
Midway offshore	17 of 17	10 of 10	15 of 17	9 of 10
Turanganui offshore	17 of 17	10 of 10	15 of 17	9 of 10
Windsurfing Lane	16 of 17	9 of 10	17 of 17	10 of 10
Outer Bay	17 of 17	10 of 10	17 of 17	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 result

Site/ location	2003 sample compliance*		2004 sample compliance*	
	All Year	Bathing season	All Year	Bathing Season
Sample sites 250 m From outfall diffuser				
NW	17 of 17**	10 of 10	16 of 17	10 of 10
N	17 of 17	10 of 10	16 of 17	10 of 10
NE	16 of 17	9 of 10	14 of 17	8 of 10
SW	14 of 17	9 of 10	15 of 17	9 of 10
S	16 of 17	10 of 10	16 of 17	10 of 10
SE	16 of 17	10 of 10	13 of 17	8 of 10
Sample sites 500 m from outfall diffuser				
NW	11 of 11	4 of 4	16 of 17	10 of 10
N	11 of 11	4 of 4	16 of 17	10 of 10
NE	11 of 11	4 of 4	15 of 17	8 of 10
SW	11 of 11	4 of 4	15 of 17	10 of 10
SE	11 of 11	4 of 4	16 of 17	10 of 10

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Freedom camping

The East Coast is one of the few areas in New Zealand where freedom camping is permitted, and both locals and out-of-town visitors relish the opportunity. It's New Zealand the way it should be, one camper commented.

Summer camping from Labour weekend through to Easter is allowed on reserve land at Turihaua, Pouawa and Loisel's beaches, and at Tolaga Bay, Tokomaru Bay and Waipiro Bay.

Freedom camping is also allowed (inland) at Donneraile Park.

For many families, camping on the coast is an annual tradition, but the environmental effects are significant, the main problems being effluent and rubbish disposal. Each family or group is required to supply their own chemical toilet, and the Council provides jumbo bins for rubbish and porta-potty tanks at each popular locality during the peak of the season, from pre-Christmas to the end of January.



Above: Freedom camping at Pouawa.

Campers are required to obtain a permit from the Council, for which there is no charge. Donations are accepted to offset the cost of rubbish and effluent removal. There were 2,812 campers on the Coast during the 2004 summer season. Donations for that season amounted to \$1,377, and yet the cost of providing the bins and effluent collection came in at around \$16,000.

The dune and foreshore area is a sensitive environment, and damage does occur through the trampling of so many feet. There are old rubbish holes now exposed at Pouawa where rubbish was buried by campers pre-1980s. There were long-drop loos in those days, too.

Camping rubbish contains material ranging from tins and glass through to scraps and shellfish remains. Council is looking into the possibility of a contractor providing a daily rubbish collection using official rubbish bags. Since Gisborne is committed to zero-waste, the facility for recycling is desirable. The responsibility falls on the campers to be thoughtful about rubbish and respectful of the sensitive environment they are able to enjoy, so that camping areas are left in a perfectly tidy state ready for the next year.

Sand extraction

The Poverty Bay beaches are prograding (each year sand builds up), thanks to the Waipaoa River, and it is therefore permitted to take sand from the beach at two vehicle access points on Centennial Marine Drive. Extraction must be from the beach itself and must not disturb coastal vegetation.

For amounts of less than 2 cubic metres (a trailer load), no consent is required. For larger volumes required for construction, a consent is required. The Gisborne District Council has on record 16 active sand extraction permits. The size of each permit varies from 80 to 4,000 cubic metres per annum.

In 2003, 15,000 cubic metres of sand was used to reinstate the site of the now closed Paokahu Landfill.

At sites like Wainui Beach and Tolaga Bay, dunes are actively eroding and sand extraction is prohibited.

Coastal hazards and sea-level rise

We know without a doubt that the climate is changing. It is believed the Earth is warming at a rate faster than at any other time in the last 1000 years. Surface temperatures increased by around 0.7°C during the 20th century, sea temperatures have risen by up to 0.5°C. Sea level has steadily risen by 25cm since the early to mid 1800s, and is projected to accelerate.

Net sea level rise at Gisborne has been measured at 2.3mm per year (1926 to 1990). This figure represents an average sea level rise for all of New Zealand of 1.7mm per year, combined with 0.6mm of geological 'sinking' occurring locally. Changes over the next 100 years could be more rapid than the natural variations that have occurred over the last 10,000 years. Predictions for the whole of New Zealand are for sea level to rise by 30 to 50cm for the period 1990-2100.

Because many of our communities are situated on or near the coast, climate change has major significance for Gisborne District.

It is possible that the frequency and intensity of storms may increase in the Southern Hemisphere, and therefore coastal erosion caused by waves and swell may increase.

Storm surges occur when winds and low barometric pressure combine to temporarily elevate the ocean level to up to a metre above the predicted tide level. Storm surges increase the possibility of inundation of coastal properties and affect river mouths by causing water to back up. Sea-level rise will gradually increase the risk of inundation by storm surges.

Tsunami of limited size and extent have occurred along our coastline at least three times in the past 100 years. Sea level rise will not increase the frequency of tsunami; they are generated by geological events. However sea-level rise will increase the risk of inundation of coastal land by a tsunami.

It is impossible to quantify the amount of shoreline retreat that may occur for a given rise in sea level, however it is generally accepted that climate change will increase shoreline erosion for sandy beaches, particularly 'bounded' beaches like Wainui with low to no dunes. The width of the present foreshore or beach may not be sufficient to accommodate this erosion.

'Hard' coastal protection works such as seawalls are not the answer as they cut off supplies of sand to the beach and cause accelerated erosion in front of the walls, worsening the overall erosion. Erosion at the end of the wall is also increased.

The sandy, accreting (building-up) beaches of Poverty Bay may continue to accrete, but more slowly, depending on whether sediment supply from the Waipaoa River can keep pace with its removal by coastal erosion. This will depend on many factors including change in storm frequency and intensity in the hill country, vegetation changes and changes to the rivers and their beds.

Sea level rise will continue for several centuries, even if greenhouse gas emissions are stabilised. Erosion of sandy beaches is therefore likely to continue well beyond this century.

Erosion of cliffs that comprise sedimentary rocks and clays/silts will probably continue at similar or slightly higher rates. Cliffs with a gravel or boulder beach at the base (that acts as a buffer) may experience no changes to current cliff retreat rates.

Te Tapuwae o Rongokako Marine Reserve

Te Tapuwae o Rongokako Marine Reserve, 16km north of Gisborne, protects a piece of coastline of approximately 2,450 hectares, extending offshore from a four-kilometre golden sand beach.



The reserve was established in 1999 as a result of years of work by joint applicants Ngati Konohi and the Department of Conservation. It is named for the footprint of Rongokako, an ancestor

of East Coast tradition, whose footprint is embedded in one of the rocky structures of the marine reserve. In the five years since establishment, marine life in the reserve has already measurably flourished.

The reserve is the subject of scientific study to quantify the recovery within a fully protected area. It is apparent there are major changes taking place in the abundance of various species. In particular, crayfish have become so numerous within the reserve their feelers can sometimes be seen emerging from the water at low tide. The size classes of crayfish within the reserve show a marked increase compared with crayfish caught outside the protected area.

Marine reserves, like national parks, protect both marine life and every natural feature found within the reserve. People are encouraged to visit and observe sea life within the reserve, but the rule is strictly no-take.

Te Tapuwae o Rongokako contains eight distinct habitat types including inshore reef, rocky intertidal platforms and sediment flats. The reserve contains kelp forests, home to numerous fish species such as scarlet wrasse (puwaiwhakarua), scorpionfish, sweep (hui) and leatherjackets (kokiri). Sponges, hydroids, anemones, soft corals and sea squirts inhabit the rock faces and overhangs. On the intertidal reef there are snails, barnacles, crabs and seaweeds.

Numerous bird species may be seen at various times: gannets, New Zealand dotterels, oystercatchers, terns, penguins and gulls have all been seen feeding within the reserve. New Zealand fur seals, dolphins and whales are regular visitors.



Above: Dept. of Conservation Marine Scientist Debbie Freeman, measuring a crayfish from the reserve.

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Te Tapuwae o Rongokako is a very special area, of which local people are justifiably proud. Marine biodiversity will continue to flourish, allowing future generations to observe life within the sea, and science to discover the natural interactions amongst marine species, which it has never been possible to study locally before.

Tuahene Point restoration project

There are several significant restoration projects being undertaken by private individuals, groups and Trusts involving coastal land in Gisborne District. One such project is the protection and enhancement of Tuahene Point, managed by the Tuahene Point Ecological Trust.



Tuahene Point is a spectacular headland with dramatic cliffs on the Poverty Bay side and steep, erodible hill country extending down to the sea on the Wainui side. The ruins of an old light-house are



Above: Project convenor Sandy Bull shows Alan White, Biodiversity Fund Manager (DOC) the planting to date.

at the seaward tip of the headland. The land is owned by the Bell Family and in 2003 was registered as a QEII Open Space Covenant. Approximately one kilometre of fencing was required to retire 25 hectares of land from grazing, enabling planting to begin in July 2003. Funding was obtained from QEII and the Ministry of Forestry for fencing and from the Department of Conservation towards the purchase of native plants. The Gisborne District Council assisted by carrying out animal pest control prior to volunteers planting 1,400 native trees at the northern end of the point in 2003, and 2,000 (including pohutukawa) in 2004.

Project convenor Sandy Bull says restoration of the Point is a big job. The terrain is rugged and steep, so it is not easy to carry plants and equipment to where they are needed. The area required spot-spraying before plants could go in. Because of the scale of the planting, post-hole borers were used.

Tuahene Point is exposed to strong salt-laden winds and dries out in summer. Hardy plant species were chosen including karo, coprosma, tutu, flax, ngaio and pohutukawa.

Animal and weed control is ongoing and managed by Sandy on a voluntary basis, with assistance from Council staff. To December 2004, 187 animal pests have been trapped and shot including hares, cats, mustelids, rodents, magpies, rabbits and hedgehogs.

Sandy believes this is a very worthwhile project, which is enhancing one of our iconic coastal features. Wildlife will benefit, and erosion of the steep faces will be reduced by revegetation.

There are no walking tracks in the covenant, however it is accessible from the southern end of Wainui Beach. Dogs are not allowed in the covenant.