

Harbours, estuaries and beaches 2007/08

Key points:

- Testing of sediments from the Wellington Harbour sea floor found elevated concentrations of stormwater-derived contaminants.
- The Porirua Harbour is moderately eutrophic (nutrient rich) and has a moderate risk of sedimentation accumulation, signalling that there is room for improvement in the health of the harbour.
- The ecological condition of the Whareama Estuary is "fair" to "good" but the very muddy and poorly oxygenated sediments are not ideal for plants and animals.
- Castlepoint Beach is in good ecological condition.

What happened in 2007/08?

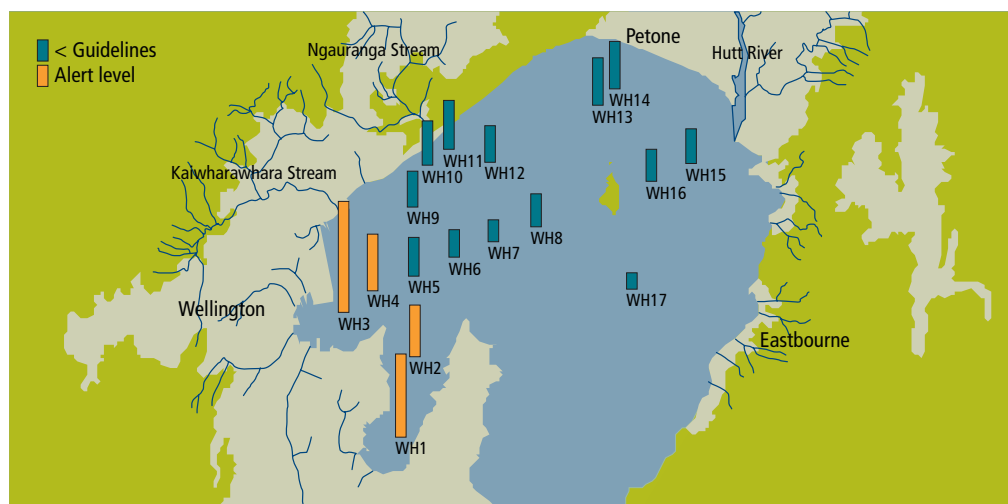
Wellington Harbour sediment quality investigation

We collected samples of sea floor sediment and benthic fauna (animals that live on or in the sea floor) from 17 locations in Wellington Harbour in late 2006. This was the first comprehensive survey of sediment quality in over 20 years, and provides an up-to-date picture of contaminant levels and the animals that live on or in the sea floor.

Tests on the sediment samples completed in 2007/08 revealed the presence of contaminants – such as heavy metals, organochlorine pesticides, polycyclic aromatic hydrocarbons (PAHs), and antifouling compounds. The highest contaminant concentrations are found in inner Lambton Basin and Evans Bay where some – including lead, copper, zinc, PAHs and the pesticide DDT – are above the "alert" levels of the national sediment quality guidelines. These areas of the harbour offer little flushing of contaminants and so act as natural sinks where contaminants accumulate over time.

Although the contaminated sediment poses little risk to people, most of the contaminants tested are persistent and toxic and could have adverse effects on sea floor marine life. Fortunately, our examination of the benthic fauna didn't show any clear evidence of harm. However, we don't know what the effects are on individual species or in areas closer to shore where sediment contamination will be higher.

Contaminants that run off hard surfaces such as roofs, roads and footpaths when it rains are a major contributor to the harbour seabed contamination. This urban runoff flows into roadside gutters and drains, then discharges into the harbour via stormwater outfalls or urban streams.



Average concentrations of total copper found in the surface sediments at 17 sites in Wellington Harbour (sampled in late 2006). Bars coloured orange indicate that copper is at a level where adverse biological effects could possibly occur and signal the need to limit further contamination. The primary sources of copper in urban stormwater are vehicle brake pad wear and architectural uses such as copper spouting.

Whareama Estuary and Castlepoint Beach monitoring

Ecological assessments of the Whareama Estuary and Castlepoint Beach were carried out in January. Based on the National Estuary Monitoring Protocol, they included an assessment of sediment grain size and chemistry, and sediment-dwelling plants and animals. The key findings were:

- Whareama Estuary: overall the intertidal habitat is generally in “fair” to “good” condition but the very muddy and poorly oxygenated nature of the sediments are a concern as they create poor conditions for plants and animals. Excessive inputs of sediment are largely a natural phenomenon given the erosion-prone mudstone soils in the catchment. Four sediment plates have been placed in the estuary and will be read annually to provide a measure of sedimentation rates.
- Castlepoint Beach: the intertidal habitat is generally in good condition. The beach sediments consist of well-oxygenated sands and support animals commonly found in exposed beach environments, such as crustaceans and beetles.

Porirua Harbour surveys

Last summer we carried out a survey of the types of vegetation and substrate (e.g. mud, sand, gravel) in the intertidal areas of the Porirua Harbour. We also undertook an ecological assessment at two intertidal sites within each arm of the harbour, the Onepoto Arm and the Pauatahanui Arm.

The surveys showed that both arms of the harbour are moderately eutrophic (nutrient rich), meaning that there is a greater likelihood of nuisance growths of sea lettuce and other algae. When assessed in December 2007, approximately 70 per cent of the inter-tidal area of each arm had at least some algal cover.

Both arms of the harbour have a moderate risk of sediment accumulation and so sediment plates were buried at five intertidal (between low and high tide) and subtidal (below low tide) locations to enable sedimentation rates to be monitored. Excessive sediment entering the harbour is not desirable because it may lead to infilling with mud, reducing the harbour’s biodiversity, recreational and other values.

We are concerned about the loss of habitat, particularly in the Onepoto Arm which has minimal saltmarsh vegetation. Sediment in the southern end of the Onepoto Arm also has the highest heavy metal concentrations, a result of contaminant inputs from urban stormwater.

The types and number of organisms living in and on the sediment indicate that the harbour is still in reasonable condition, but ongoing management and monitoring is required of nutrients and sediment entering the harbour from subdivision sites, urban stormwater and agricultural runoff.



Burying sediment plates in the Porirua Harbour. The depth to each sediment plate will be measured each year, allowing us to determine the rate of sedimentation.



Measuring the depth of oxygenated sediment in a sediment core sample from the Porirua Harbour. The greater the depth of oxygenated sediment, the better the conditions for plant and animal life in the sediment.

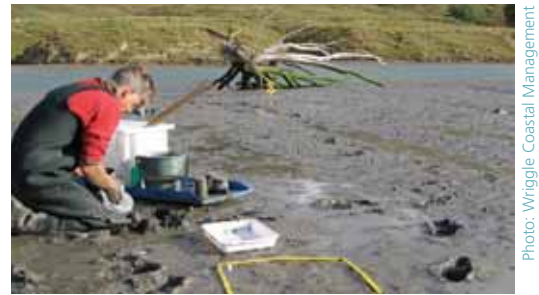


Photo: Wriggle Coastal Management

One of the monitoring sites in the Whareama Estuary, on the eastern Wairarapa coast. At each site, sediment samples are collected for laboratory testing and the algae and animals living in and on the sediment are identified and counted.

Lake Onoke assessment

An ecological assessment of Lake Onoke carried out in September 2007 identified the lake as being in a relatively poor condition, reflecting the high level of past modification for drainage. The lake is at moderate risk of further degradation from a range of stressors – such as stock grazing, vehicle damage to Onoke Spit dune vegetation, and high nutrient, sediment and pathogen inputs from land use intensification.

Greater Wellington is looking to implement a programme to monitor the health of the lake in 2009.

What is Greater Wellington doing?

- Regularly monitoring microbiological water quality at 77 coastal sites (see *Recreational water quality* report card).
- Periodically monitoring sediment quality and ecological health in sensitive estuarine and harbour environments, particularly those likely to be impacted by urban stormwater.
- Reviewing the Regional Policy Statement, with a view to promoting low impact urban design and improved management of stormwater discharges.

What can you do?

Save the drain for rain: Stormwater drains go from the roadside directly to streams or the coast. Never put rubbish, paint, oil or any other waste into stormwater drains. Paints (oil and water-based) and thinners are toxic to aquatic life, and discolour streams and coastal water.

More information

The information on this card is a summary of the more detailed 2007/08 annual coastal monitoring report, which is available on our website at www.gw.govt.nz/envreports

If you would like to know more about the coast, visit our website or contact:

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