

# REGIONAL ESTUARY MONITORING PROGRAMME

## WHY ARE ESTUARIES IMPORTANT?

Estuaries are important areas for people culturally, commercially and recreationally. They are one of the most sensitive coastal areas, and are at risk from human activities. Estuaries are major receiving environments for sediment, nutrient and water from the land, so can be affected by catchment activities.

Intertidal sand and mudflats occupy significant areas of the estuaries in the Waikato region. For example, approximately 70 per cent of Whaingaroa (Raglan) Harbour's total area consists of intertidal flats. They support diverse and abundant animal communities, providing important habitats for many fish, birds and sediment-dwelling organisms.

Sediment-dwelling organisms (animals such as shellfish, crustaceans and marine worms) have been widely used as indicators of estuary health in environmental monitoring programmes. These organisms are important because they cycle nutrients between the sediment and water, stabilise and rework sediments, and are an important food resource for birds, fish and crabs. They respond predictably to many kinds of natural and human-induced stresses. Changes in the number of species and/or the number of individual animals may point to impacts from local-scale pressures like pollution, and broad-scale pressures like increased sediment from land use and catchment activities.

## WHAT'S INVOLVED IN THE PROGRAMME?

Waikato Regional Council's Regional Estuary Monitoring Programme (REMP) began in April 2001, and focuses on sediment-dwelling organisms and sediment characteristics (the amount of mud, shell and microalgae present) as indicators of estuarine health. It is a long term monitoring programme currently carried out in three estuaries – the southern Firth of Thames, Whaingaroa (Raglan) Harbour and Tairua Harbour.

## WHAT IS THE PROGRAMME'S OBJECTIVES?

REMP is a state of the environment monitoring programme. The main objective of the programme is to monitor the health of the region's estuaries. Sediment-dwelling organism communities and sediment characteristics are used as indicators of estuarine health. By monitoring at a number of sites we aim to build up an overall picture of the state of our region's estuaries. Long-term monitoring is essential to be able to detect any trends in estuarine health.



Okete Bay, Whaingaroa (Raglan) Harbour



Sampling in Tairua Harbour



Measuring sediment levels, Firth of Thames

## WHAT METHODS ARE USED?

Five sites in the southern Firth of Thames, three sites in Whaingaroa (Raglan) Harbour and five sites in Tairua Harbour are monitored annually.

At each site 10 replicate sediment cores are taken to sample sediment-dwelling organisms. Sediment samples are also collected for analysis of grain size, total organic carbon, total nitrogen, chlorophyll a and phaeophytin concentration.

Organisms are sieved, sorted and species are identified and counted.

To measure sediment bed levels, square concrete tiles (30x30cm) were buried in the sediment at a depth of approximately 20cm. Knitting needles are used to measure the depth of sediment over each of the plates.

## WHAT DO THE RESULTS SHOW?

Marine worms and bivalves (shellfish) are the two most common groups of animals found at all sampling sites.

Overall the sampling indicates that the Firth of Thames, Whaingaroa (Raglan) and Tairua harbours are relatively healthy, with high biomass and diversity of animals at the sampling sites.

Sediment mud content ranges from 2-14 per cent in Tairua Harbour, 5-30 per cent in Firth of Thames and 25-55 per cent in Whaingaroa (Raglan) Harbour.

Sediment level measurements show that although estuaries are experiencing sedimentation in some areas, the patterns of sedimentation are highly variable. Reasons for this variability could include the movement of bedforms across the seabed, variations in current speed between spring and neap tides, and seasonal changes in water flow, wind and waves.

## FUTURE MONITORING

Continued monitoring will be important to detect any changes in sediment-dwelling organism communities and sediment properties.

We plan to expand the monitoring programme to other estuaries in the Waikato region in the future.



A bloodworm – a sediment-dwelling organism – Photo: Barry O'Brien

## MORE INFORMATION

### Contact

You can contact our coastal science team on Waikato Regional Council's freephone 0800 800 401 or by emailing [info@waikatoregion.govt.nz](mailto:info@waikatoregion.govt.nz)

### Publications

View, download or order the following publications at [www.waikatoregion.govt.nz/Publications](http://www.waikatoregion.govt.nz/Publications)

Regional Estuary Monitoring Programme 10 year trend report: April 2001 to April 2011, Waikato Regional Council Technical Report 2014/41

### Web

[www.waikatoregion.govt.nz/REMP/](http://www.waikatoregion.govt.nz/REMP/)

[www.waikatoregion.govt.nz/TR201441/](http://www.waikatoregion.govt.nz/TR201441/)

[www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Coasts/Natural-character-and-biodiversity/co1-keypoints/](http://www.waikatoregion.govt.nz/Environment/Environmental-information/Environmental-indicators/Coasts/Natural-character-and-biodiversity/co1-keypoints/)