

## Executive Summary

This is the second report detailing the results of the coastal monitoring network initiated by Environment Bay of Plenty in 1990 as part of its Natural Environment Regional Monitoring Network (NERMN) programme. A total of 53 sites are profiled on an annual basis within the current coastal monitoring programme. Some selected sites are monitored quarterly; others are monitored as necessary, i.e. after storm events or where a beach is considered to be of significant concern to the public due to impacts on private property.

Over the course of a year along the Bay of Plenty coastline, changes in the beach morphology result from “cut and fill” processes. The movement of sediment from this process is dependant on wind and wave action as well as sediment properties. These seasonal changes are superimposed on short and long term processes which act to produce periods (tens of years) of erosion, accretion and dynamic equilibrium.

Wave action is the dominant forcing process causing changes in erosion and accretion patterns along the Bay of Plenty coastline. Wave conditions in the Bay of Plenty are moderately influenced by the El Niño Southern Oscillation. More stormy conditions than average tend to occur during La Niña periods, which are associated with an increase in northeasterlies in the New Zealand region. During El Niño years, where a higher occurrence of southwesterlies occurs, wave conditions in the Bay of Plenty are somewhat reduced although episodic extra-tropical cyclones still occur. Given that since 1998 we have entered a negative phase of the Interdecadal Pacific Oscillation where neutral or La Niña conditions may be more likely to occur, it is possible that the Bay of Plenty region may experience increased rates of erosion over the next 20 to 30 years, similar to that experienced in the late 1960s and early to mid 1970s (Bell et. al., 2006).

Over the period of the physical coastal NERMN (typically 16 years of data to date), 53 sites have been monitored to access changes in beach profile position and beach volume.

The overall beach state (Table 1) generally shows common patterns per reported beach system. This is not unexpected as typically these beach systems are affected by sources of localised sediment influx from fluvial sources or are separated by a number of natural obstructions, such as:

- hard-rock coastline north of Waihi Beach
- northern Tauranga Harbour entrance
- southern Tauranga Harbour entrance
- Mount Maunganui
- Town Point, Maketu
- Kohi Point headland, Whakatane
- Ohiwa Harbour entrance

These features punctuate the general direction of littoral drift in the Bay of Plenty of north west to south east flux, though there are areas where the direction of net sediment movement has been modelled to be orientated towards the north west (Bell et. al., 2006; Phizacklea 1993). Littoral drift is the main mechanism by which sediment is supplied to a beach; it is also a value that is difficult to measure directly.

Table 1 Beach state for the NERMN beach profile sites.

Beach system	CCS site	Site Name	Beach state
Hikuwai	1	Opape East	Stable
	2	Waiaua River West	Erosion?
	3	Tirohanga Stream West	Erosion
	4	Hikuwai West	Erosion?
	5	Waiotahi Beach East	Erosion
	6	Waiwhakatoitoi	Erosion?
	7	Waiotahi Spit	Accretion?
	8	Ohiwa Spit	Accretion
Ohope	9	Ohope Spit	Erosion
	10	Ohope	Erosion
	11	West End	Erosion?
Thornton	12	Whakatane Spit	Stable
	13	Piripai	Accretion?
	14	Golf Links Road	Erosion?
	15	Airport	Erosion?
	16	Rangitaiki East	Stable
Matata	17	Rangitaiki West	Stable
	18	Lawrences Farm	Stable
	19	Tarawera East	Accretion?
	20	Matata Domain	Stable
	21	Matata	Accretion?
	22	Murphy's Motor Camp	Stable
	23	Pikowai Motor Camp	Erosion?
	24	Otamarakau	Erosion
Pukehina	25	Rodgers Road	Erosion?
	26	Pukehina Trig	Erosion
	27	Pukehina West	Erosion
	28	Pukehina Middle	Erosion
	29	Pukehina West	Erosion
	30	Makatu Headland	Erosion?
Papamoa	32	Kaituna River East	Accretion?
	33	Kaituna River West	Erosion
	34	Taylor Street	Erosion
	35	Papamoa Beach	Accretion?
	36	Papamoa	Accretion?
	37	Papamoa Surf Club <sup>1</sup>	Accretion?
	38	Te Maunga	Erosion
	39	Mount Maunganui East	Erosion?
	40	Mount Maunganui	Accretion?
Matakana <sup>2</sup>	41	Fire Break Road	Stable
	42	Bird Sanctuary	Erosion
	43	Tank Road	Accretion?
	44	Matakana Island Centre	Stable
	45	Dead End Road	Stable
	46	Matakana Island North	Erosion
Waihi	47	Waihi Beach South	Erosion?
	48	Waihi Beach- Pio's Point	Erosion?
	49	Waihi Beach Island View	Stable
	50	Waihi Beach Island	Stable
	51	Waihi Beach North	Stable
	52	Waihi Beach Surf Club <sup>1</sup>	Accretion?
	53	Waihi Beach Stream <sup>1</sup>	Accretion
	54	Esplanade Road <sup>1</sup>	Accretion

Note: 1 – data is from 1998 - 2006, 2 – data is from 1992 - 2006

Results from this report show that the following beaches are showing trends of erosion for the period 1990-2006:

- Ohope Beach
- Pukehina Beach
- Southern area of Waihi Beach
- Central section of Hikuwai Beach

A continuation of this NERMN is important in the management regime of this coastal area. There are increasing pressures (development and recreational) in this coastal environment. The profile monitoring provides a baseline dataset for determining the physical state of these beach systems. Additional increasing pressures such as sea level rise further enforce the requirement for this monitoring to continue. A future monitoring schedule has been outlined in Chapter 6 of this report which will allow for timely and representative information to be collected and analysed.

