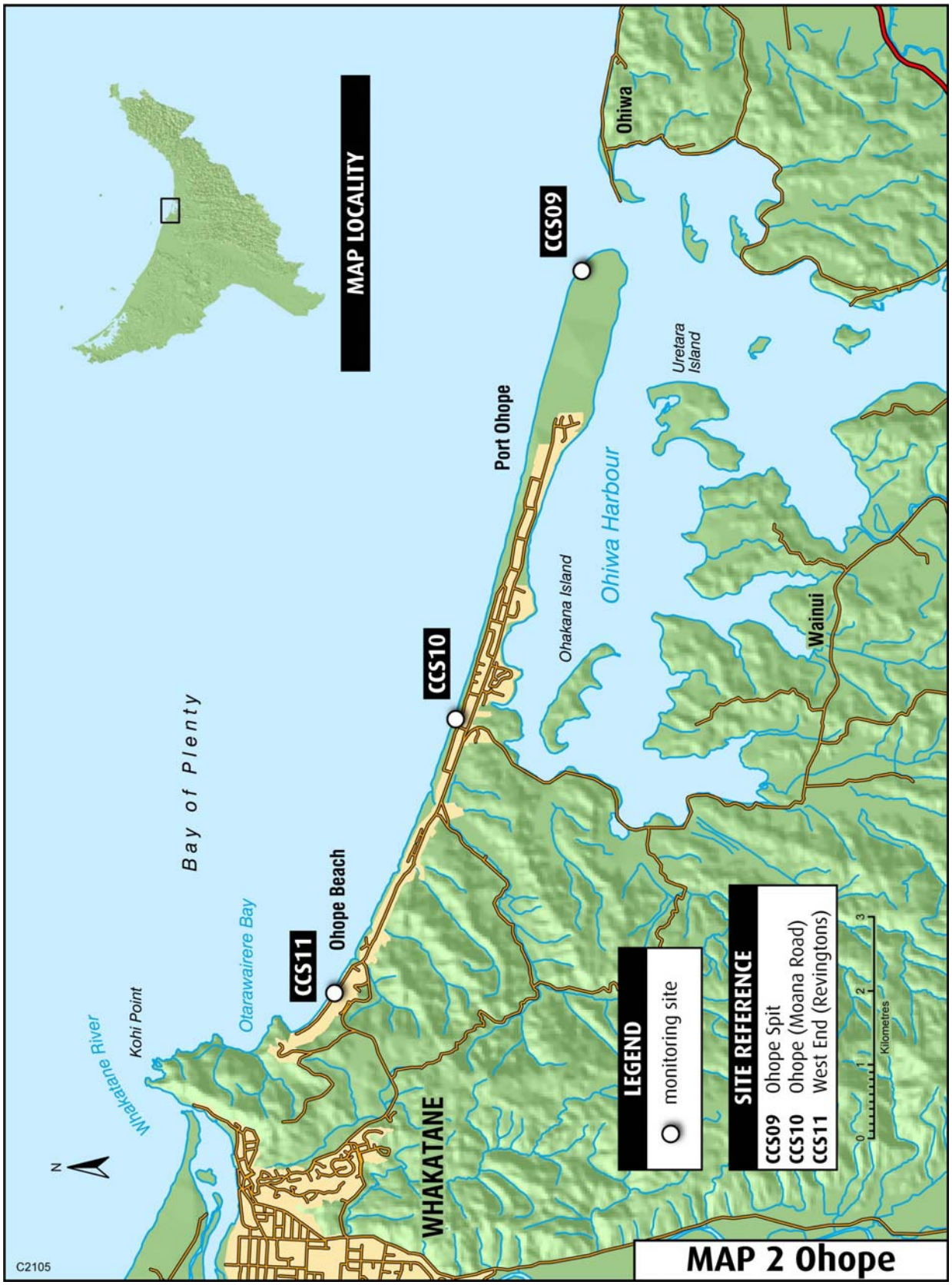
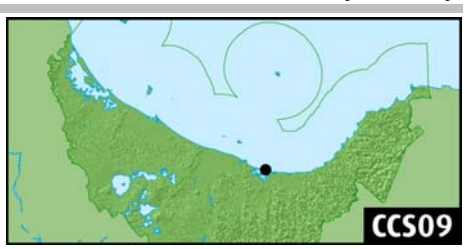
5.4 Ohope Beach system



5.4.1 **Ohope Spit (CCS 9)**



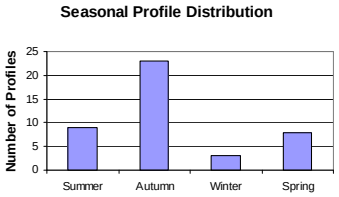
Discussion

The site is located 200m to the west of the Ohiwa Harbour entrance. The Ohope Spit evidently formed rapidly through longshore drift in the late Holocene (c. 2000 calendar years BP) Richmond et al. (1986); Beanland & Berryman (1992). Murdoch (2005) has proposed a new mid-Holocene evolutionary model. The model is based around new radiocarbon ages obtained from subsurface shells, in situ tree stumps, together with tephrochronology and investigations of buried soil horizons. The spit attained its current (historical) length by 4190 cal. yrs B.P. based on a shell date of this age near the spit's eastern end. A dominant feature is the series of six well vegetated sub parallel dune ridges that recurve on the distal eastern end towards the harbour (Julian, 2006).

Ohiwa and Ohope Spits appear to be in a state of dynamic equilibrium, as Ohiwa Spit is now in a state of strong accretion; the Ohope Spit is currently in a *state of strong erosion*. This trend is highlighted in the profile summary and the statistical analysis. Conversely, Gibb (1994) when reporting on the trend for 1944-1994 stated a shoreline advance of approximately 200m.

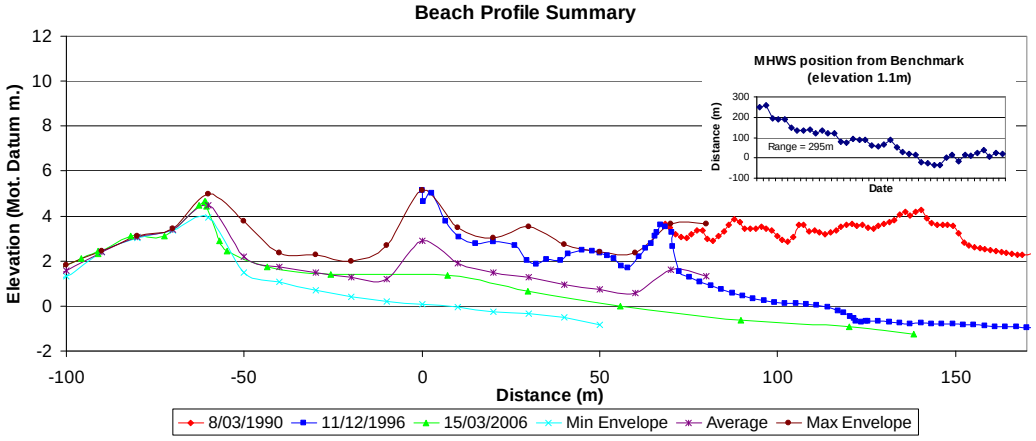
The offshore profiles show a significant loss of the sand when comparing the 2003 against the 1992 profile. A dominance of El Nino conditions (Figure 4.1) would result in an increased eastward drift and a resulting loss of material from the Ohope Spit and corresponding renourishment of the Ohiwa Spit/Bryans Beach section (as evidenced in Section 5.3.8).

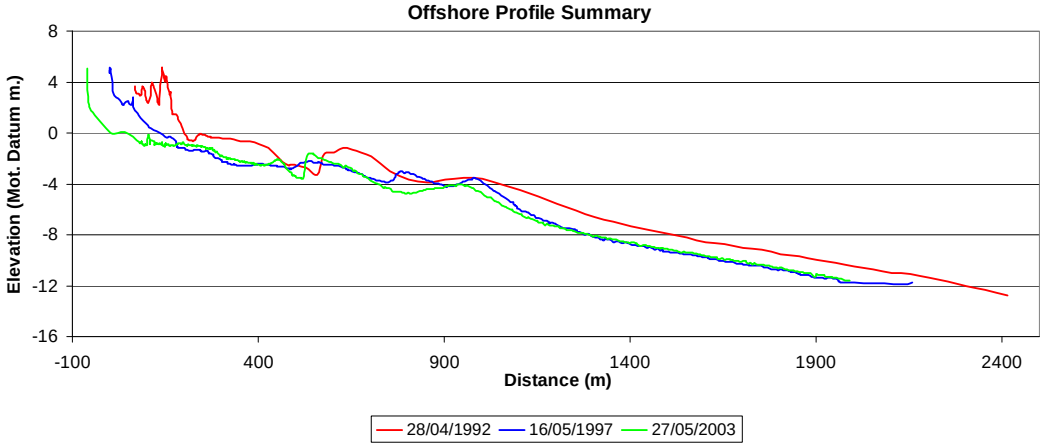
CCS 09 - Ohope Spit

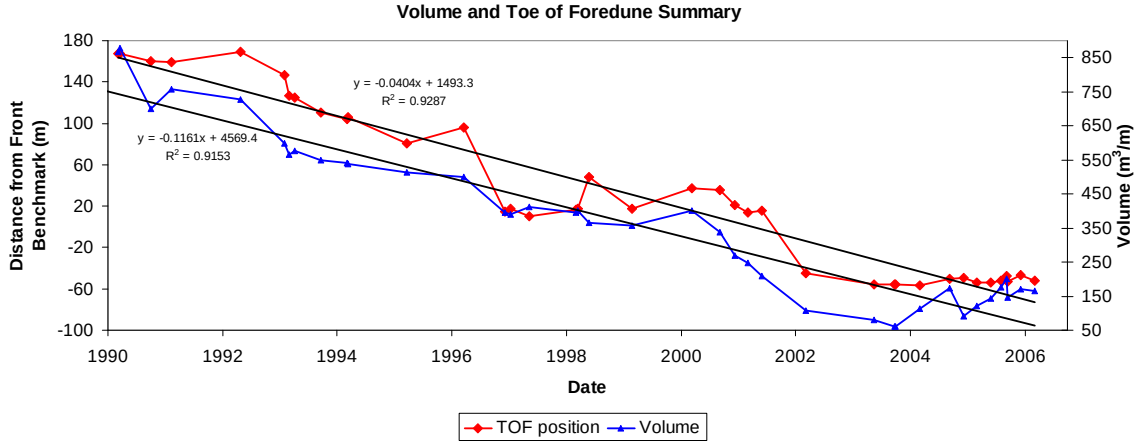


State: Erosion

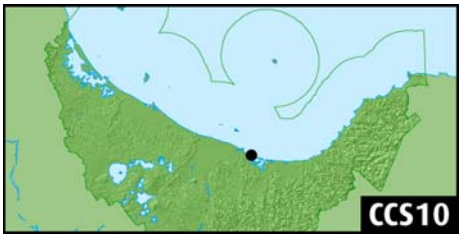
Location: NZMG 2873878E 6348979N
Period of record: 1990 – 2006
No. of profiles: 39
Morphodynamic type (Wright Short model): Longshore Bar and Trough
Volume p-level – 0.00 **TOF p-level.-.**0.00







5.4.2 **Moana Street (CCS 10)**



Discussion

This site is located 7km from the Ohiwa Harbour entrance. Like CCS9, the photographic evidence shows that a significant landward beach position change has occurred along this section of the Spit. Faceted dune scarps exhibiting deficient vegetation growth along central Ohope Beach and Ohope Spit provide visual evidence of an actively eroding beach profile (Julian, 2006).

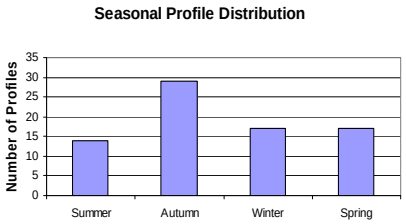
Investigation of the profile summary shows a landward retreat of the frontal dune at this site. This trend is supported by the MWHS plot showing a 44m horizontal range at a fixed elevation of 1.1m.

The offshore profile record shows the seaward movement of sediment and the development of a sizable offshore bar. Dissipative beaches normal do not normally exhibit marked offshore bars but in this erosive state material could well be stored some distance offshore.

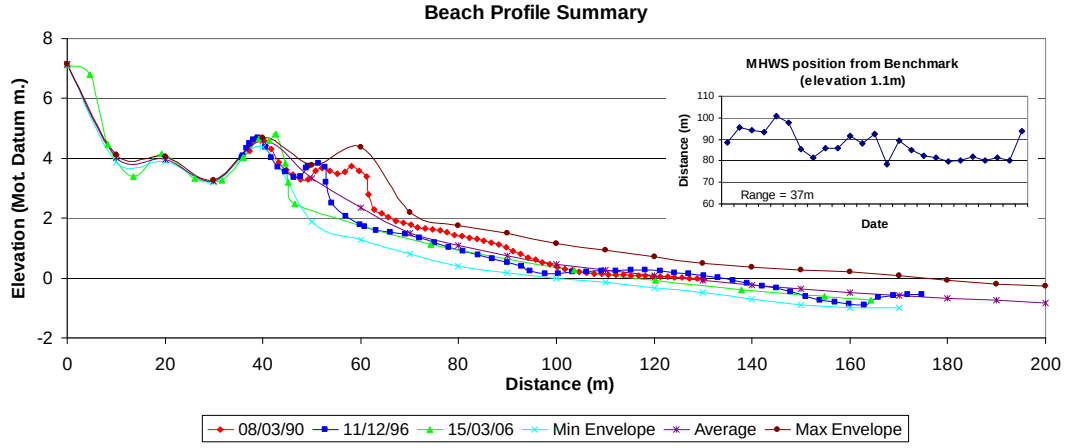
Statistical analysis of the toe of foredune position and beach volume show strong negative sloped trends indicating a *state of erosion* for this site. As with CCS9, Gibb stated a long-term trend (1944-1994) of shoreline advance of approximately 65m, ranging from 45 to 80m for this section of beach.

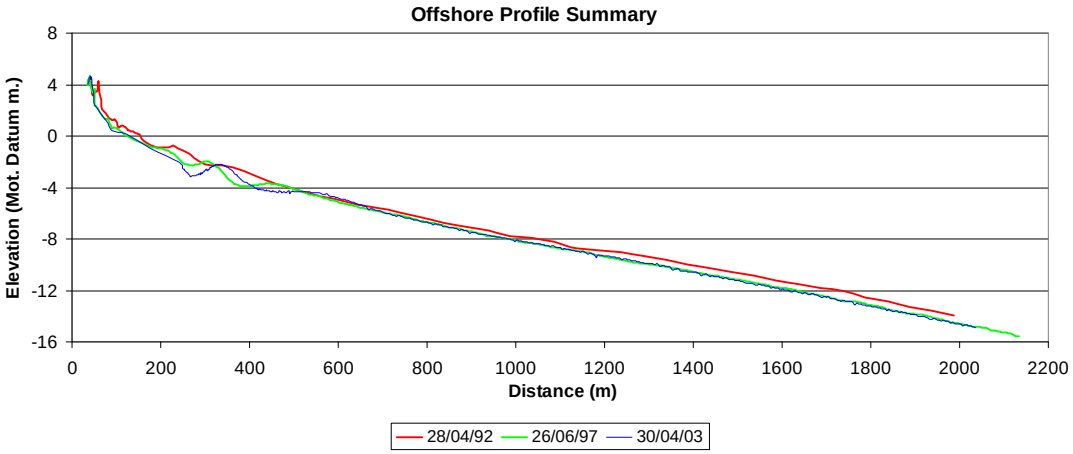
CCS 10 - Moana Street

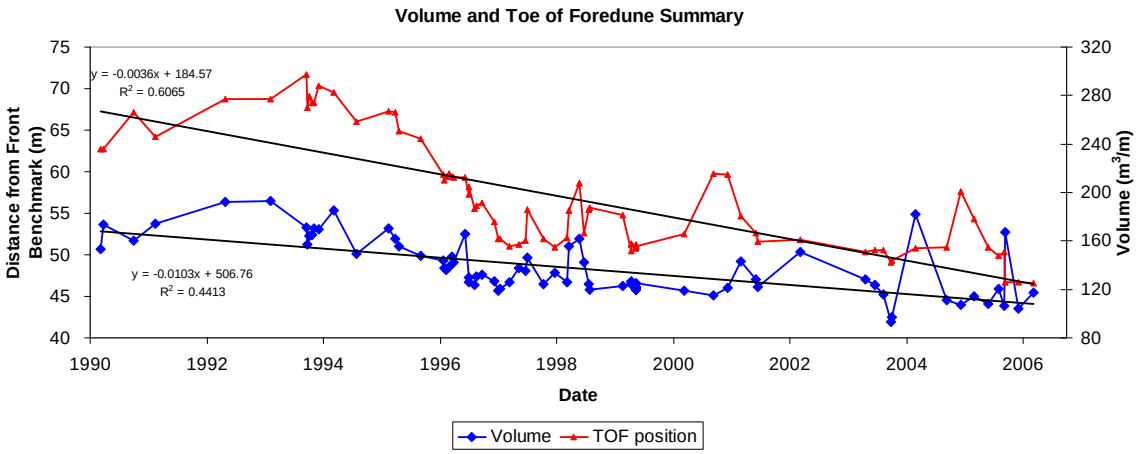
State: Erosion

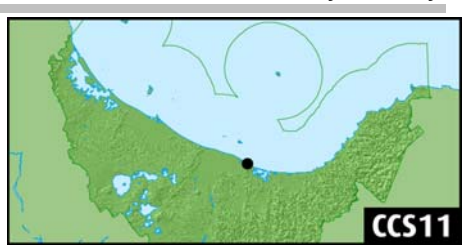


Location: NZMG 2867816E 6350682N
Period of record: 1990 – 2006
No. of profiles: 77
Morphodynamic type (Wright Short model): Dissipative
Volume p-level – 0.00 **TOF p-level –** 0.00









5.4.3 **West End (CCS 11)**

Discussion

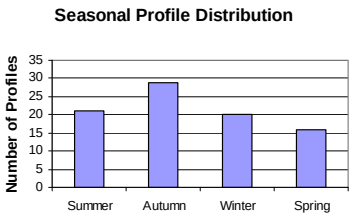
This site is located 800m to the east of the Kohi Point headland. This section of Ohope Beach has a north-north east aspect. Steep cliffs shelter the beach from south and south easterly winds (Saunders, 1999). The photographic history shows a well vegetated low profile upper beach area. The 2006 photograph shows the effects of several significant storms and the introduction of a number of exotic vegetation species.

The profile summary shows the retreat of the frontal dune position. Most of this landward movement occurred during the three events listed in Table 3.1 (January 1996, December 1996 (Cyclone Fergus) and January 1997 (Cyclone Drena)). Not only was there a horizontal retreat measured, but also a significant reduction in beach elevation, as material was removed off the upper beach. The offshore profiles show no significant offshore bar (sand reservoir). When discounting the divergent 1992 profile (700 – 1700m offshore) the remaining two profiles converge at -6m.

The statistical analysis shows a significant retreat in the toe of foredune position. The volume record is markedly different for the period 1999 to 2003 when there was significant vertical growth in the beach profile. The state proposed for this site is *heading toward erosion*. As with the other Ohope Beach sites, Gibb (1994) when analysing an earlier period of record calculated a long-term trend (1944-1994) of shoreline advance of approximately 15m for this section of beach.

CCS 11 - West End

State: Erosion?



Location: NZMG 2864107E 6352323N
Period of record: 1990 – 2006
No. of profiles: 85
Morphodynamic type (Wright Short model): Dissipative
Volume p-level – 0.91 **TOF p-level –** 0.00