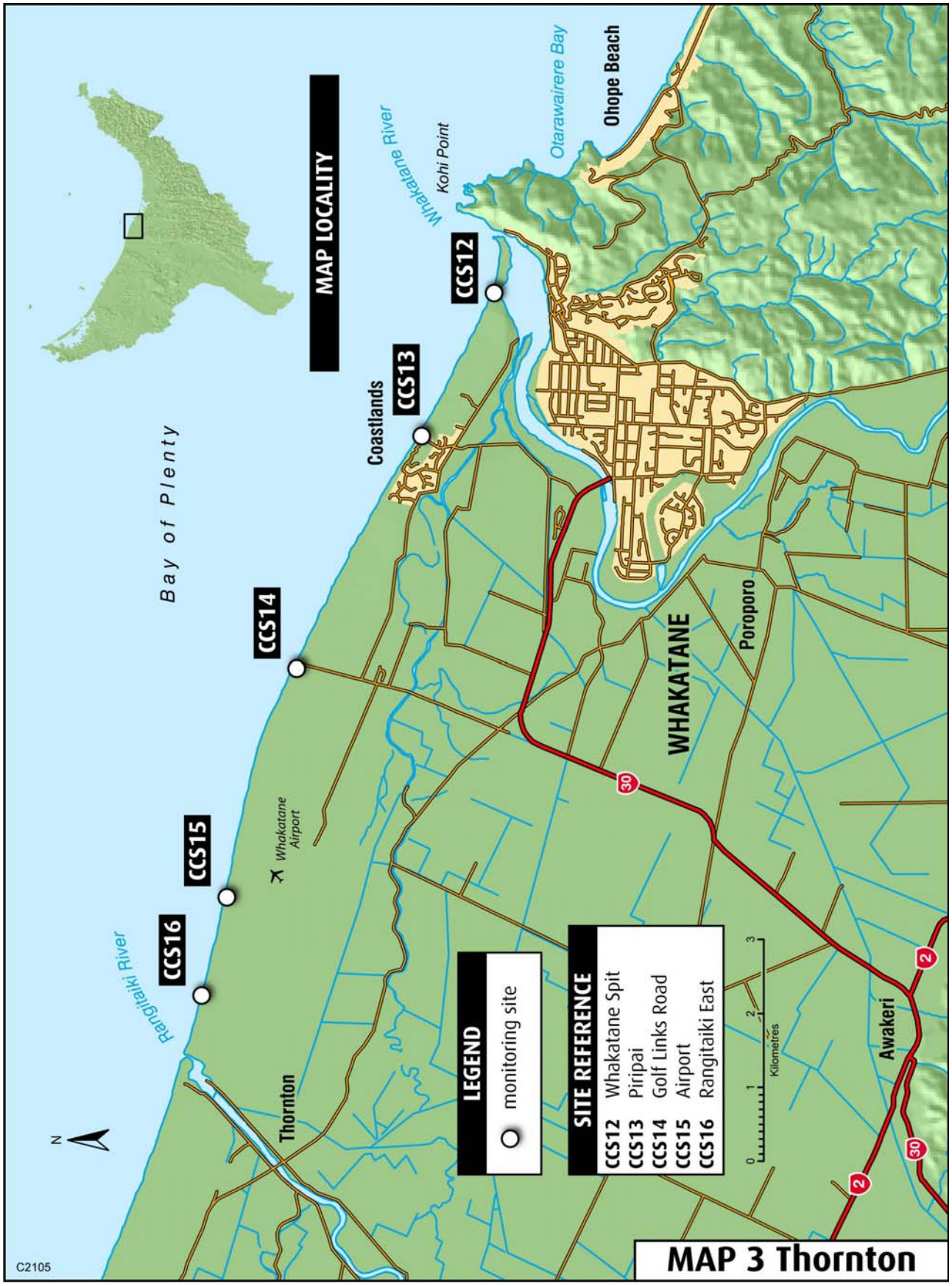
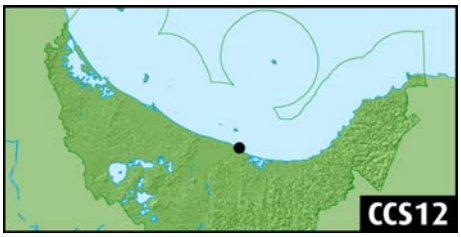
5.5 Thornton Beach system



5.5.1 **Whakatane Spit (CCS 12)**



Discussion

This site is located 700m to the west of the Whakatane River entrance. Healy (1983) used old survey plans and aerial photography to determine the movements of the Whakatane Spit. The analysis suggests the spit has been is a state of dynamic equilibrium since 1923.

The profile record shows a significant change for the period 1990 to 1996, during this period the section volume has been increasing at a rate of ~26m^3/m/year with a shoreline advance of ~8m/year.

The offshore profiles measured in 1997 and 2003 show stability in the nearshore zone, this pattern turns to marked deposition in the zones, 600-1200m and 1400-1800m offshore. The upper elevation of these two deposition lobes matches the profile measured in 1992. This deposition would be the result of pulses of sediment supplied to the coast from the Whakatane River during periods of elevated flow.

The statistical tests performed on the volume and toe of foredune datasets didn't meet the significance level, hence a *state of stable* has been proposed for this site.

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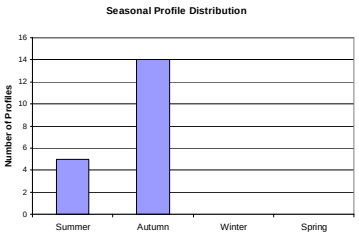
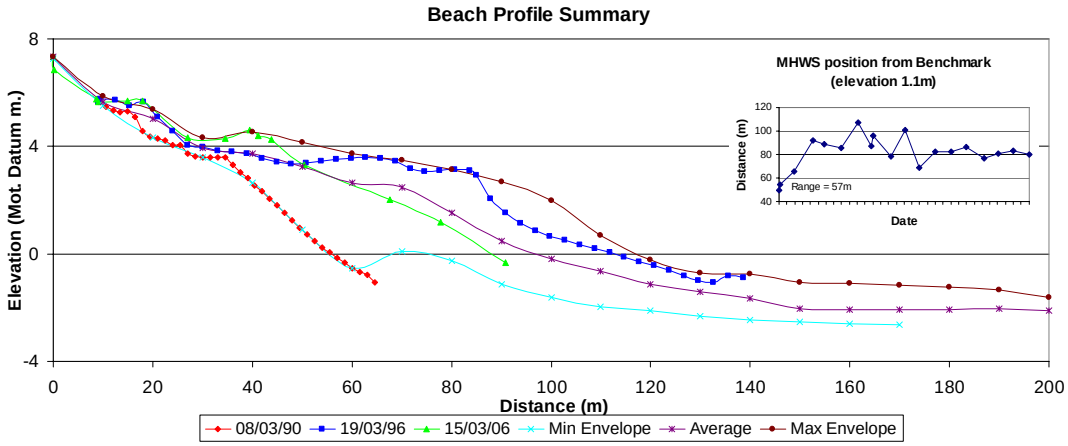
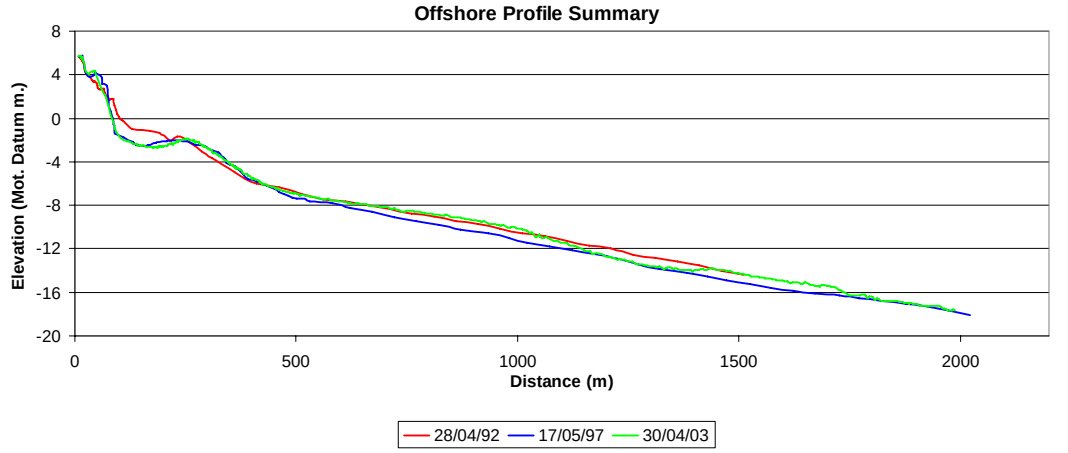
CCS 12 - Whakatane Spit

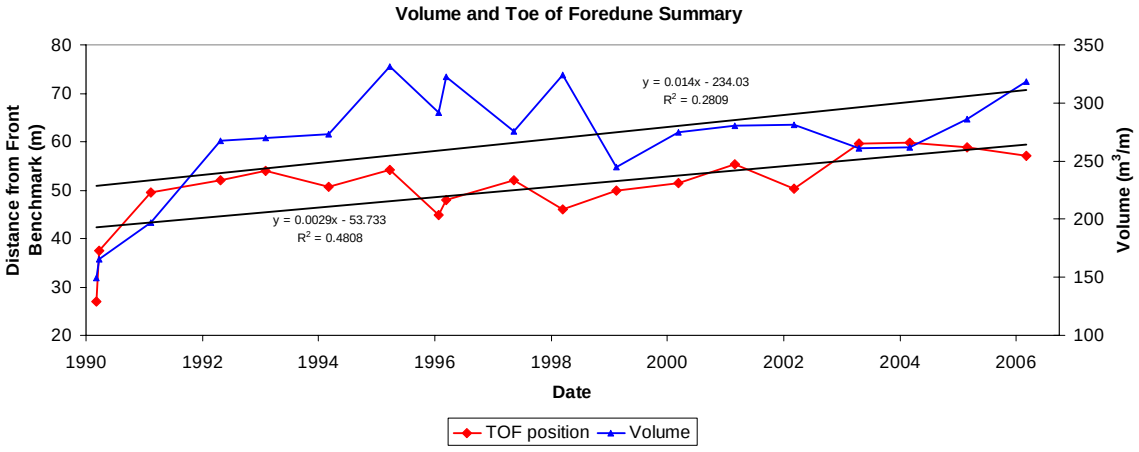


State: Stable

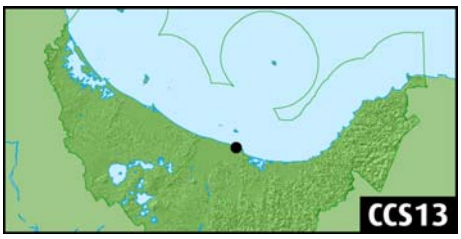
Location: NZMG 2861755E 6354371N
Period of record: 1990 – 2006
No. of profiles: 19
Morphodynamic type (Wright Short model): Transverse Bar and Rip
Volume p-level – 0.02 **TOF p-level –** 0.00







5.5.2 **Piripai (CCS 13)**



Discussion

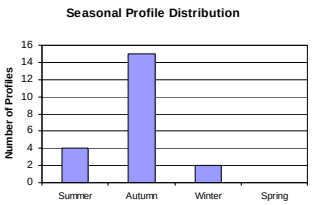
This site is located at the end of Ohuirehe Road, 2.8km to the west of the Whakatane River entrance. A rate of shoreline advance of 0.3m/yr since the Tarawera eruption in 1886 was reported by Pullar & Selby (1971). Gibb (1994) reported toe of foredune advance for the period 1944 to 1994. Healy (1976a) considered that progradation had ceased at Piripai and that the most dominant trend in the last 30 years was for net erosion with the greatest retreat occurring within minor embayment's that change their location along this section of beach (Tonkin & Taylor, 2002).

The profile summary shows the development of an incipient dune which is well vegetated (see Photograph 2006) with *spinifex*.

The offshore profiles show a variety of patterns. The 1992 profile has no offshore bar present, investigation of the onshore profile shows it to be in a eroded state. This lack of offshore bar is common to both adjacent sites signalling an erosion state for this section of beach pre 1992.

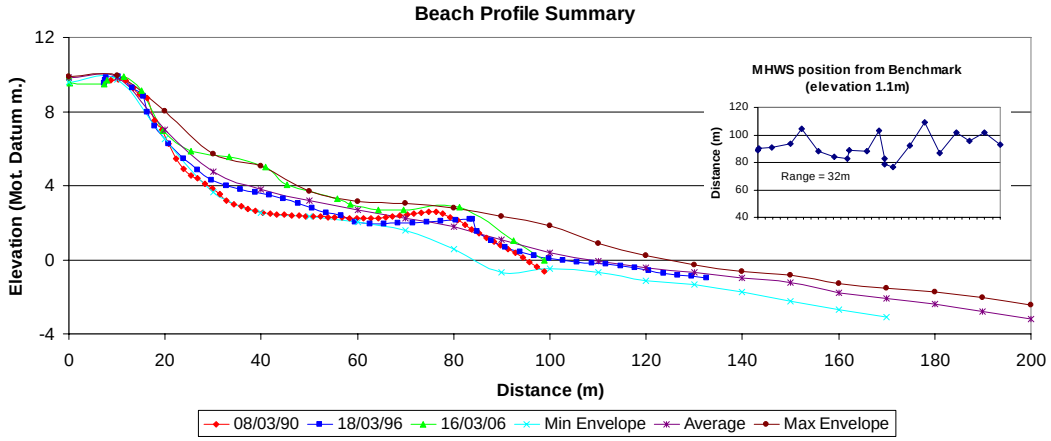
Statistical analysis shows a significant trend in the volume data set. The trend of the toe of foredune dataset is not as strong and hence a *trend towards accretion* has been proposed for this site for the period of record 1990 to 2006.

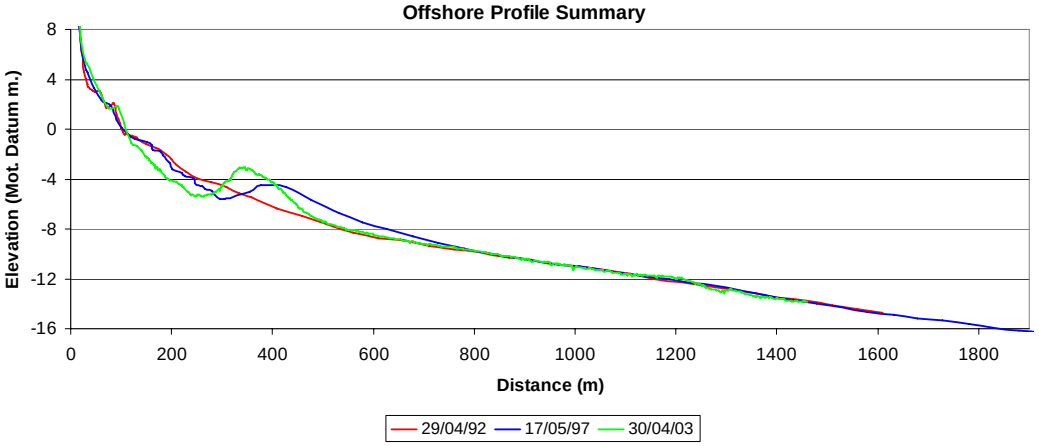
CCS 13 - Piripai

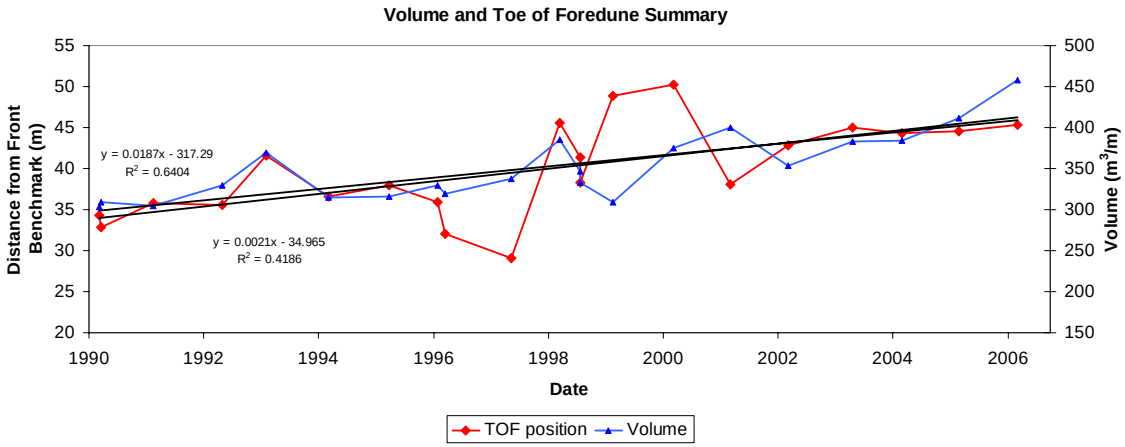


State: Accretion?

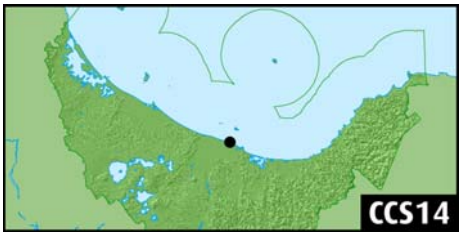
Location: NZMG 2859819E 6355350N
Period of record: 1990 – 2006
No.of profiles: 21
Morphodynamic type (Wright Short model): Transverse Bar and Rip
Volume p-level – 0.00 **TOF p-level –** 0.02







5.5.3 Golf Links Road (CCS 14)



Discussion

This site is located at the end of Golf Links Road, 700m east of the apex of the eastern cuspate foreland caused by wave refraction around Moutohora (Whale) Island (7km offshore). Aerial photography (2003) shows the back dune area is punctuated with a network of 4 wheel drive tracks. This dune system is approximately 50m wide. Both photographs exhibit a low frontal dune with a sparsely vegetated face. The 2006 photograph highlights a storm debri line at the base of the frontal dune.

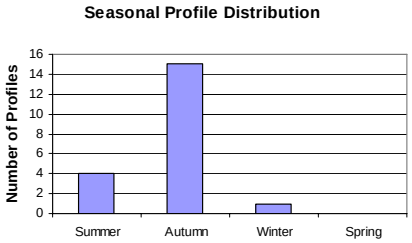
The profile summary shows the latest profile exhibiting loss in the lower and mid beach areas when compared with the average. The accumulation in the 2006 profile on the crest of the dune is probably the result of the survey not undertaken on the benchmark orientated shore normal line.

The offshore profile shows a similar pattern to that exhibited at CCS13. A small poorly defined bar is present in 1992, contrasted by well developed bar/trough structures in 1996 and 2003.

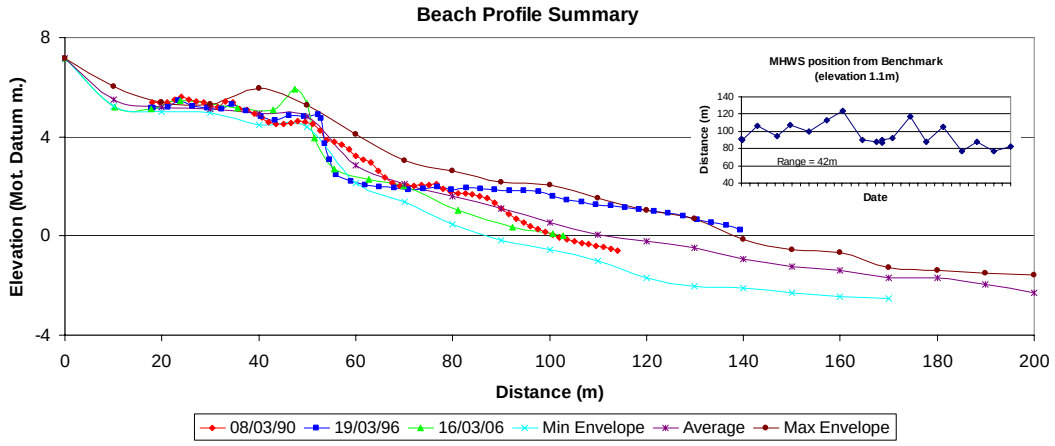
The volume and toe of foredune chart shows a seaward movement of the toe from 1992 to 1996 but since then the position of this feature has been moving landward (approximately 20m). The trend in the volume is not as strong which exhibits variation around a shallow sloping trend line. The proposed trend for this period of record is a *movement towards erosion*.

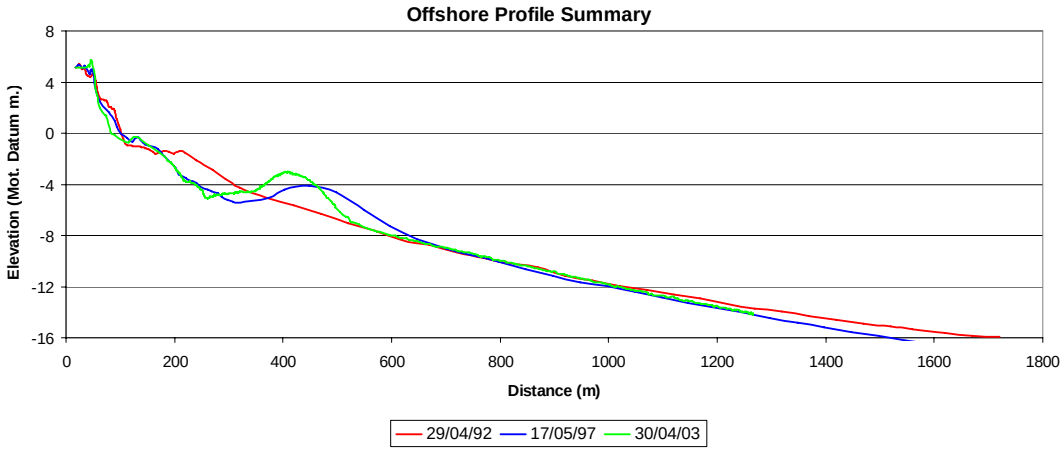
CCS 14 - Golf Links Road

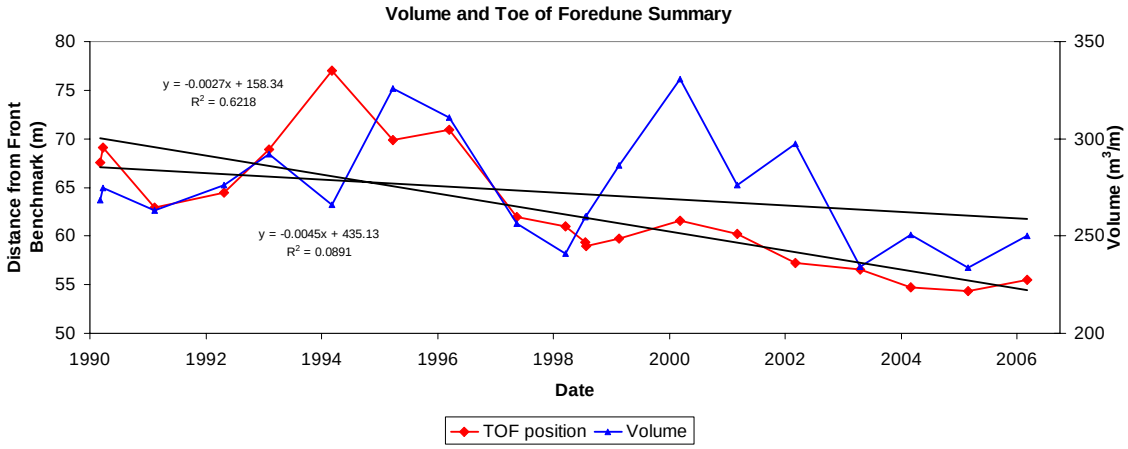
State: Erosion?



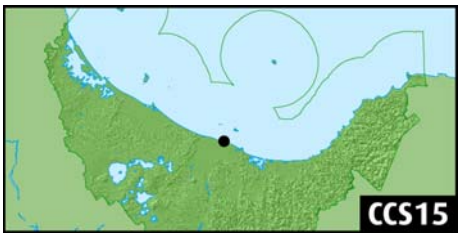
Location: NZMG 2856683E 6357038N
Period of record: 1990 – 2006
No. of profiles: 20
Morphodynamic type (Wright Short model): Low Tide Terrace
Volume p-level – 0.20 **TOF p-level –** 0.00







5.5.4 **Airport (CCS 15)**



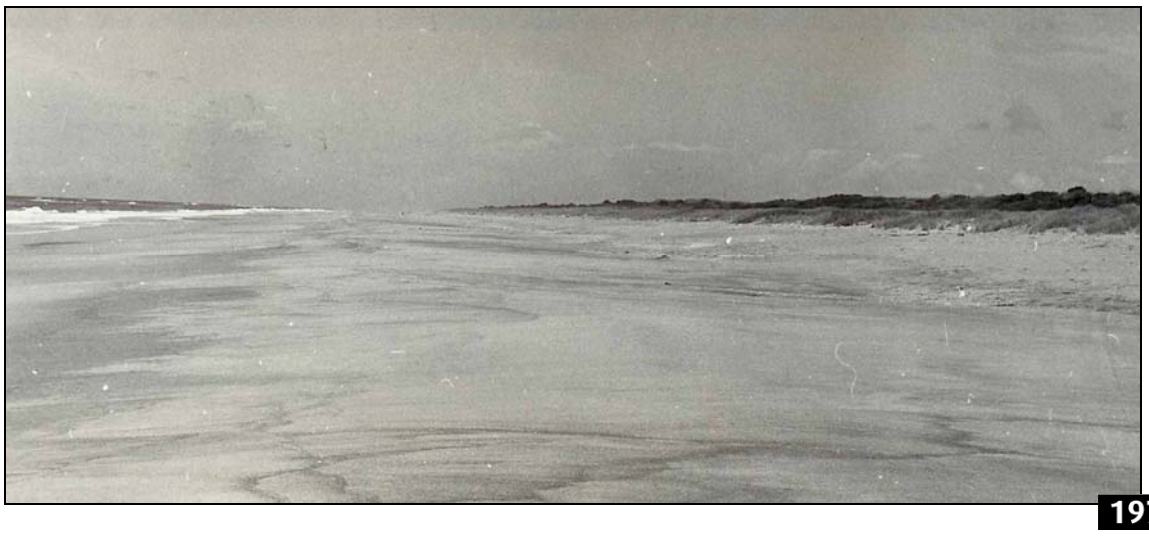
Discussion

This site is located 2.3 km east of the Rangitaiki River entrance. This section of coast (which includes CCS14), located in the lee of Moutohora (Whale) Island, shows long term progradation due to the wave shadow effect from the island and sediment supply from both Whakatane and Rangitaiki rivers (note the Rangitaiki River sediment contribution has diminished since the construction of the mid catchment Matahina Dam, commissioned in the late 1960's).

The profile summary shows a landward retreat of the foredune for the period of record. The 2006 profile mimics the average for the mid and lower beach sections. The 1996 profile shows seaward development of the frontal dune. The MHWS position shows a horizontal variation of 26m during the period of monitoring.

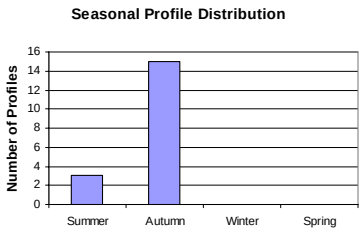
The offshore profile record show offshore bar and trough features in the 1992 and 1997 profiles. These features have disappeared in the 2003 survey.

The statistical analysis shows no significant trend in the volume record. The toe of foredune position shows a significant negative trend for this site. The state for this site has been proposed as a *trend towards erosion* for the period of record. Gibb (1994) gave the following summary for this section of beach - long-term trend (1944-1994) of shoreline advance of approximately 55m, ranging from 33 to 77m, with short-term fluctuations of 30 to 40m.

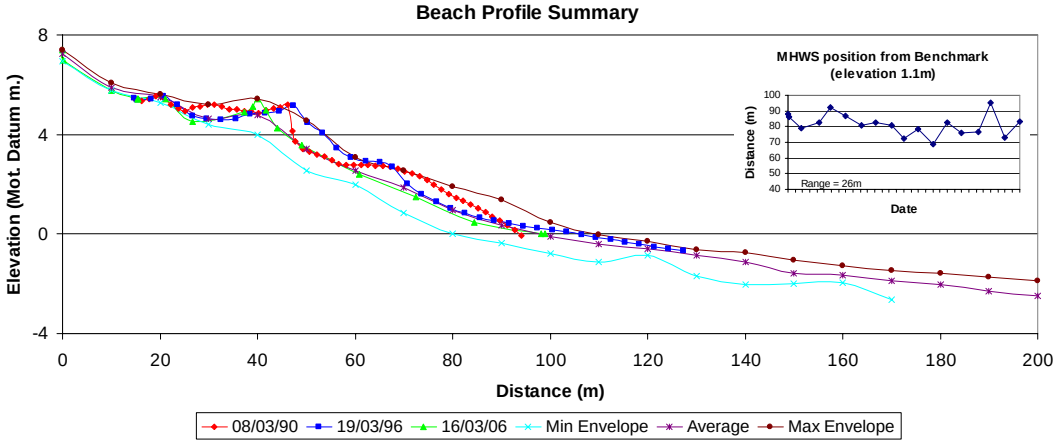


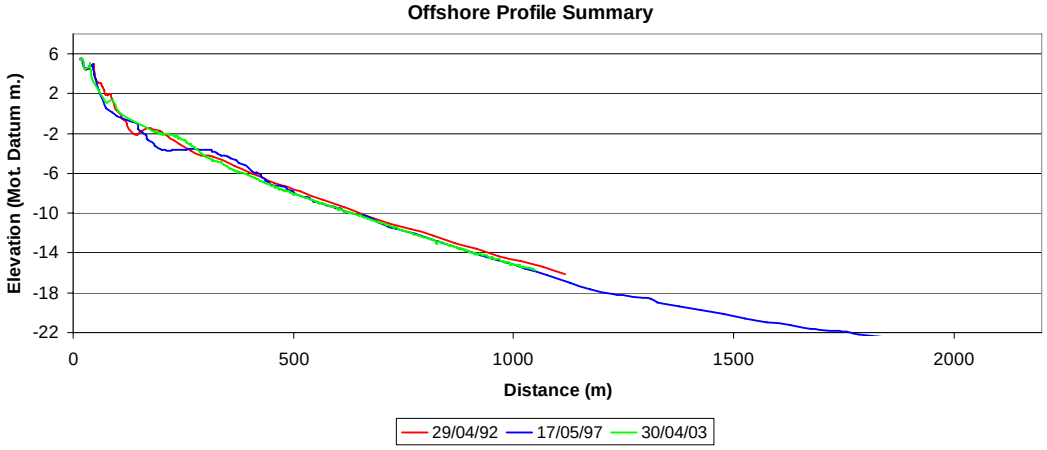
CCS 15 - Airport

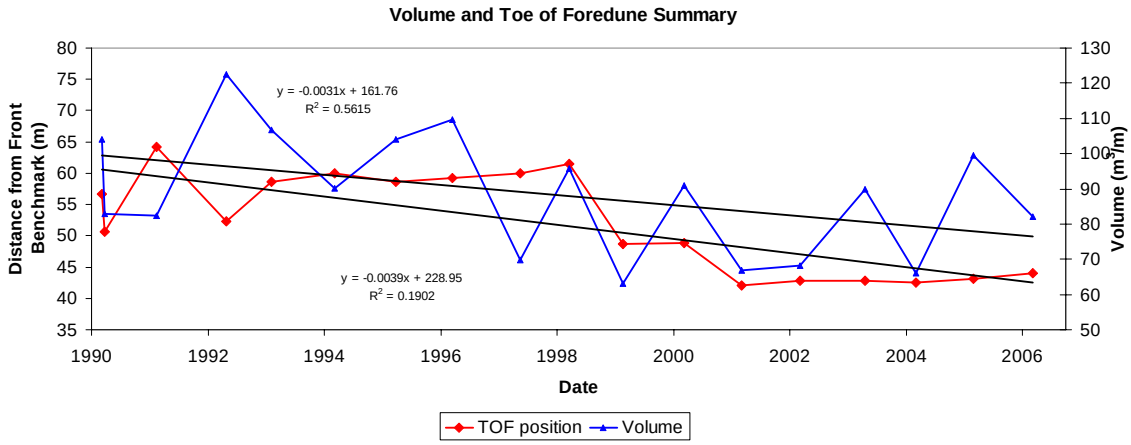
State: Erosion?



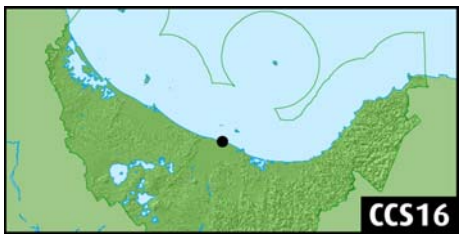
Location: NZMG 2853588E 6357978N
Period of record: 1990 – 2006
No.of profiles: 18
Morphodynamic type (Wright Short model): Longshore Bar and Trough
Volume p-level – 0.07 **TOF p-level –** 0.01







5.5.5 **Rangitaiki East (CCS 16)**



Discussion

This site is located 850m to the east of the Rangitaiki River entrance. At this site the dune system width is approximately 100m wide and is backed by the Thornton Lagoon. A network of 4 wheel drive vehicle tracks is also present surrounding this site. Early photography shows a well developed berm and a moderately vegetated frontal dune (some areas of wind erosion is present). The 2006 photograph shows a similar vegetation state and a storm debris line at the base of the frontal dune.

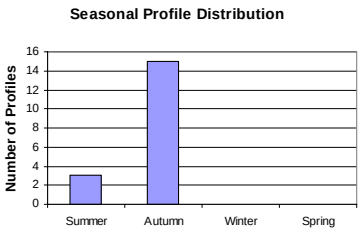
The profile record shows a landward retreat of the steep faceted dune face between 1990 and 1996. This has reversed with the 2006 profile showing redevelopment of the frontal dune in a seaward position.

The offshore profiles all exhibit bar and trough structures. The position of landward edge of the offshore bar has varied by up to 200m. Initial convergence occurs at -8m.

The statistical test shows no trend for either of the reported parameters. This site has determined *stable* for the period of record. Gibb (1994) stated a long-term trend (1922-1994) of shoreline advance of 45 to 120m, largely from training of the river mouth, with short-term fluctuations of 30 to 40m for this section of beach.

CCS 16 - Rangitaiki East

State: Stable



Location: NZMG 2852261E 6358320N
Period of record: 1990 – 2006
No. of profiles: 18
Morphodynamic type (Wright Short model): Transverse Bar and Rip
Volume p-level – 0.78 **TOF p-level –** 0.80