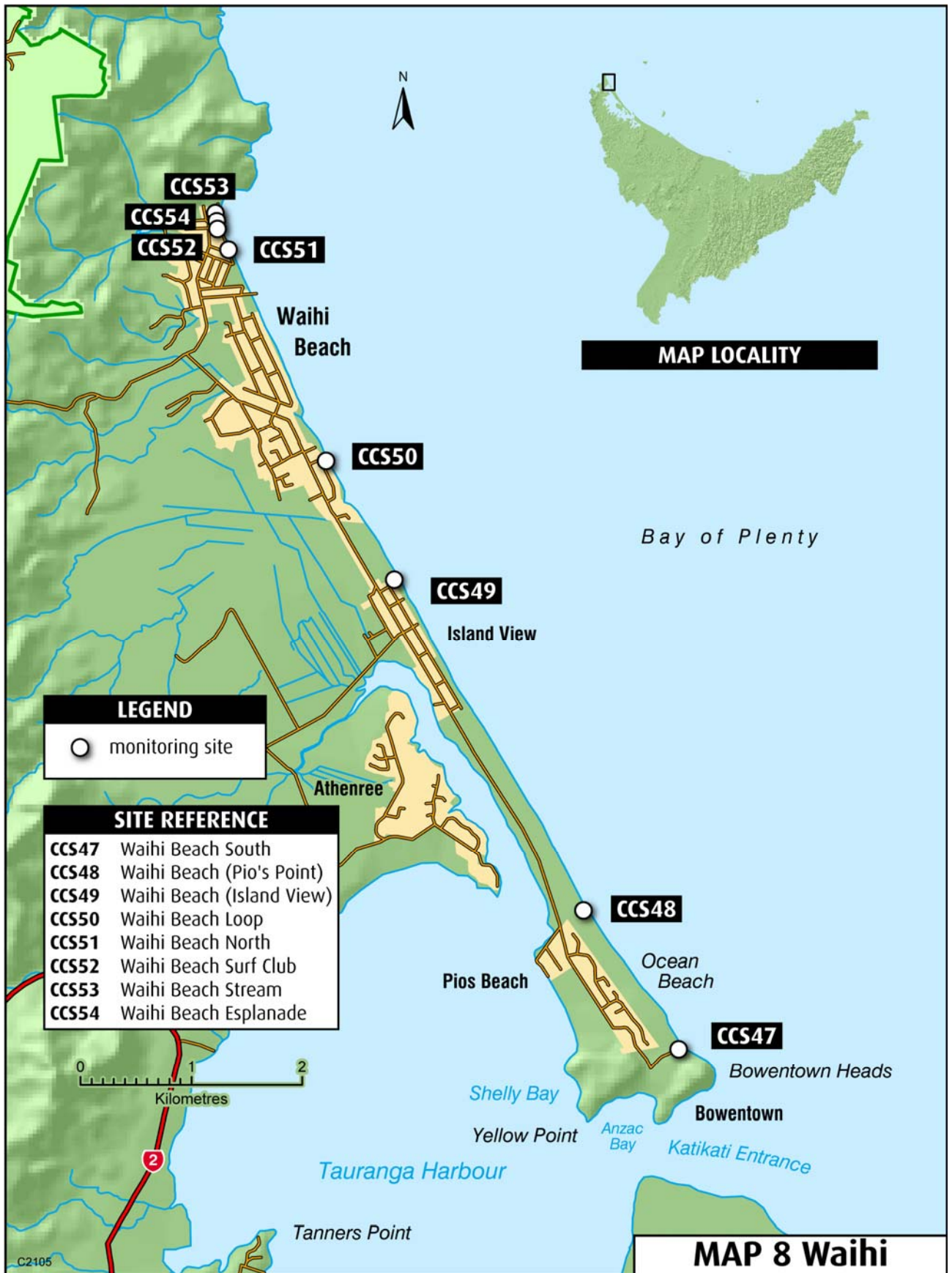


5.10 Waihi Beach system



5.10.1 Waihi Beach South (CCS 47)

Discussion

This site is located 500m northwest from the Bowentown entrance to the northern Tauranga Harbour. The site is strongly affected by the tidal inlet and associated localised circulation pattern with tidal flows through this inlet. Interaction of sediment between the ebb tidal delta and this section of beach is strongly linked. The frontal dune at this site has been modified dramatically by human activity. The site is located at a popular access point; historically this has not been well managed. Today a timber wall has been erected to try and halt foredune retreat. This work has also been supplemented with retiring sections of the dune and undertaking re-vegetation with native species. Eco Nomos Ltd (2003) stated a measure 19m of duneline progradation between September 1978 and April 1994.



The 2006 photograph shows a well vegetated frontal dune with a low spinifex vegetated slightly cut incipient dune in the foreground.

The profile history shows a wide band of movement in beach position evidenced by the maximum and minimum envelope location. The 1990 profile shows a healthy beach profile with a normally sloping frontal dune and a well developed berm. This has changed over the last 16 years with a landward movement of the frontal dune position and loss of beach sediment volume and expected beach features (berm) in 1996. The 2006 profile shows some recovery with an increase in elevation and the sign of early berm development.

The offshore profile record exhibits the effect of this sections close proximity to the ebb tidal delta. Marked sediment movement is shown to 1300m offshore at a depth of approximately - 8m.

The beach volume fluctuates in accordance with sediment moving to a from the ebb tidal delta and probably affected by an eddy forming in the lee of the Bowen town headland, no significant result is determined by the statistical test. The foredune position however does exhibit a statistically significant trend with erosion being dominant for the 16 years of record analysed. These results give a combined state of that heading towards erosion.

No early photograph (1970's) is available for this site.



CCS 47 Waihi Beach South

State: Erosion?

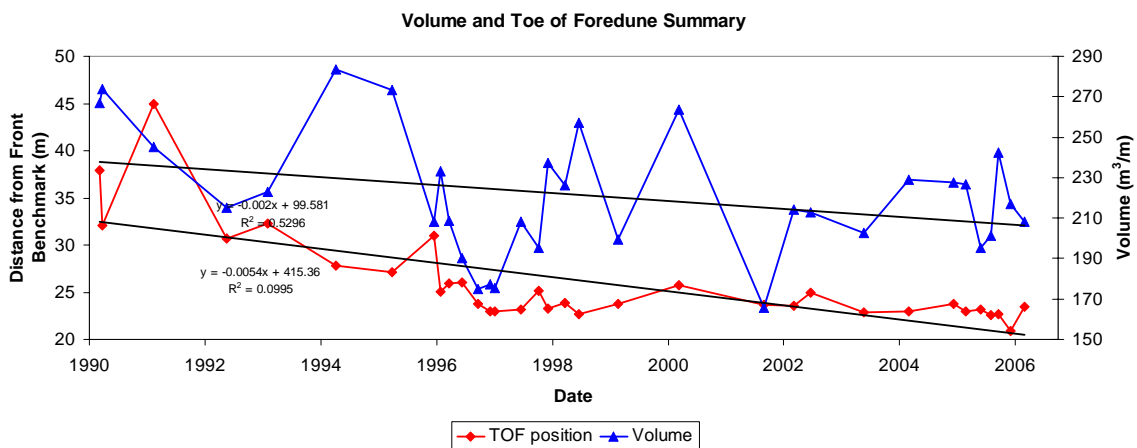
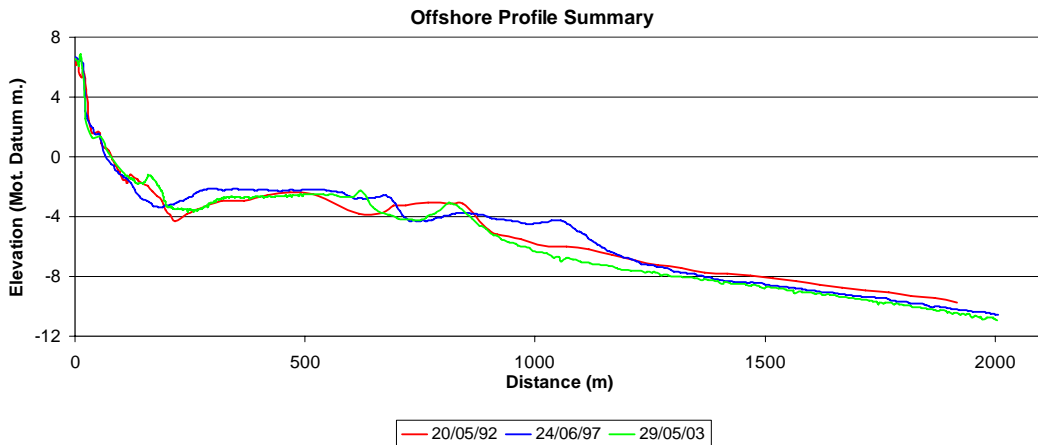
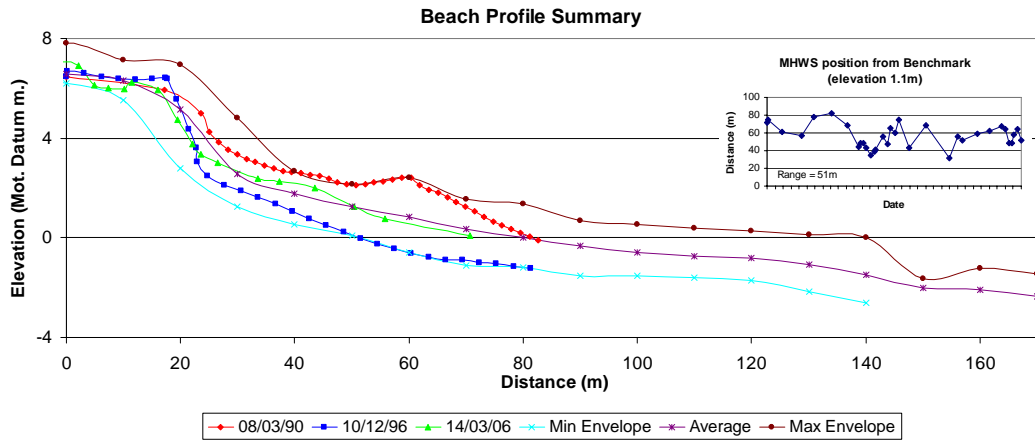
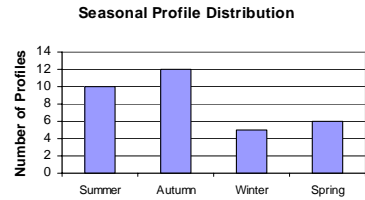
Location: NZMG 2774543E 6411088N

Period of record: 1990 – 2006

No. of profiles: 33

Morphodynamic type (Wright Short model): Rhythmic Bar and Beach

Volume p-level – 0.07 TOF p-level – 0.00



5.10.2 Waihi Beach (Pio's Point) (CCS 48)

Discussion

This site is located 2km to the northwest of the Bowentown entrance. Gibb (1994) states the section of beach from Ocean Beach to Island View is 4km long sand beach bordering a 250 to 750m wide tombolo of Pleistocene and Holocene dune complexes derived primarily from offshore sources. The 2006 photograph shows a gently sloping beach with no berm formation present. The foredune is currently in a state of erosion with undercut vegetation occupying a steepened face.



The profile history also reflects this steepened and eroded frontal dune. The 2006 profile has retreated by some 6m when compared with the more traditional frontal dune shape exhibited by the 1996 profile. The 1996 profile also shows a well developed berm which forms the maximum position the beach has been in at that elevation. The MHWS plot shows a variation of 33m for the 1.1m elevation.

The offshore profiles show an interesting pattern for this site. It is normally common for the profiles to "pinch out" or converge at a depth which normally marks the extent of typical sediment exchange caused by wave action. For this site all three profiles run parallel for the entirety of the survey. This could be the result of an origin datum issue which requires further analysis of the initial survey processing.

Both the volume and toe of foredune datasets show negative slope for the timeseries. Statistical significance tests show only the toe of foredune to be significant. These results give a state heading towards erosion for this beach section.

No early photograph (1970's) is available for this site.



CCS 48 Waihi Beach (Pio's Point)

State: Erosion?

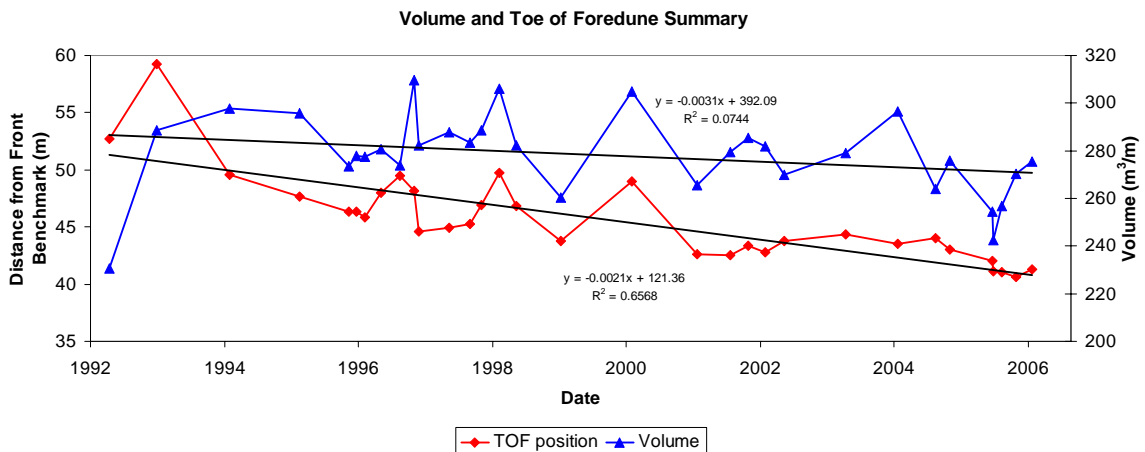
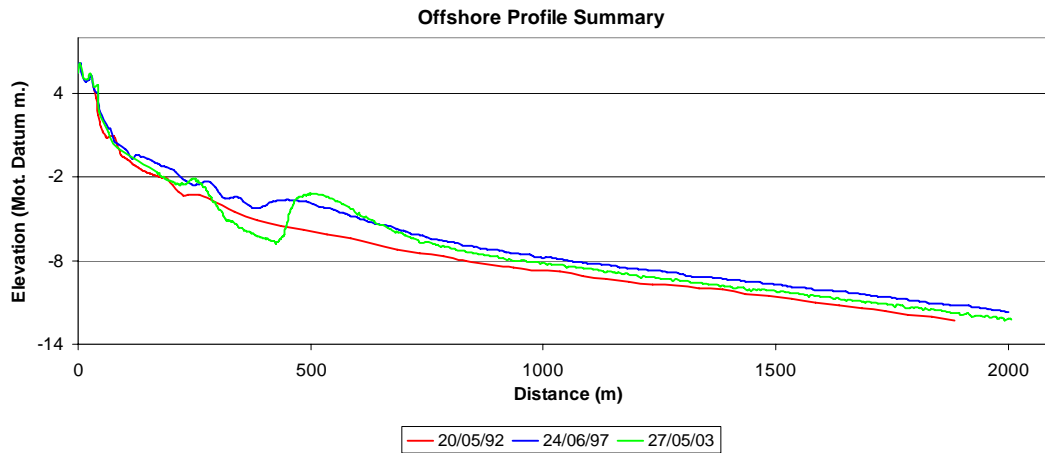
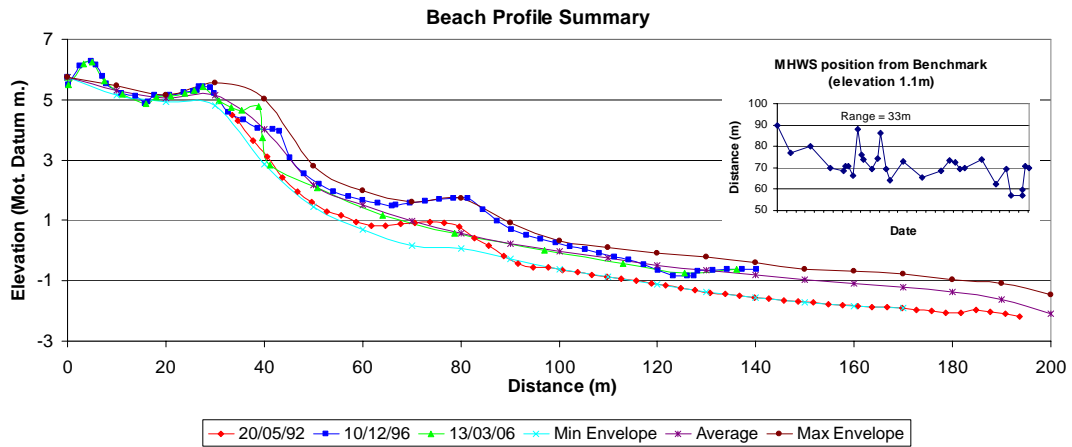
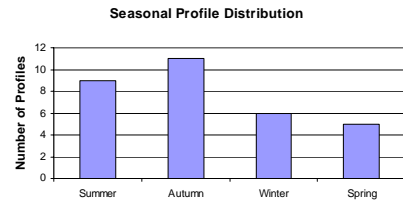
Location: NZMG 2773683E 6412344N

Period of record: 1990 – 2006

No. of profiles: 33

Morphodynamic type (Wright Short model): Longshore Bar and Trough

Volume p-level – 0.13 TOF p-level – 0.00



5.10.3 Waihi Beach (Island View) (CCS 49)

Discussion

This site is located approximately half way along the Waihi Beach system, 6km northwest of the Bowentown Entrance. Eco Nomos (2003) stated that in the area of Waihi Beach to the south of Island View, available data is limited and subject to significant uncertainties but suggests that (i) duneline fluctuations considerably exceed the scale of changes likely to be associated with storm cut and recovery, and (ii) the larger fluctuations evident in this area probably reflect the additional influence of deep, arcuate duneline embayments (see Stephens, 1996) and (at the southern end of the beach) the adjacent Bowentown ebb tide delta.



The 2006 photograph shows a beach with a well vegetated foredune and the development of an incipient dune in the foreground, no berm or low beach feature is present. This is also some evidence of cusp features present.

The profile history shows no remarkable characteristics. The 1996 profile shows a change in the upper beach position, although this is most probably the result of a slightly different survey line being used. The maximum/minimum envelope shows a reasonably confined range of vertical movement.

The offshore profiles show bar movement in the zone within 400m of the shore. The 1997 and 2003 profiles converge at -6m, approximately 600m offshore.

The volume and toe of foredune record both show positive slopes, however both show no significant trend when the statistical test is applied, therefore a state of stable has been derived for this section for the last 16 years of profiling record.

No early photograph (1970's) is available for this site.



CCS 49 Waihi Beach (Island View)

State: Stable

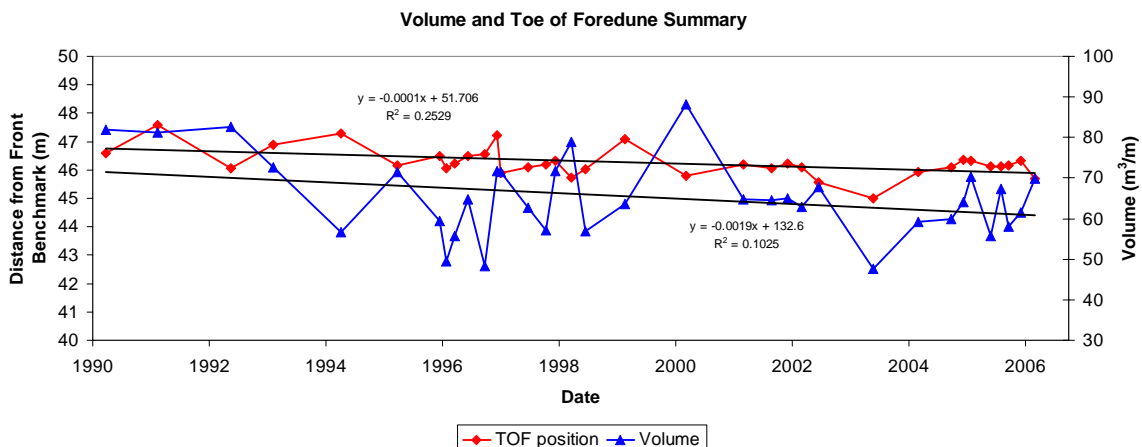
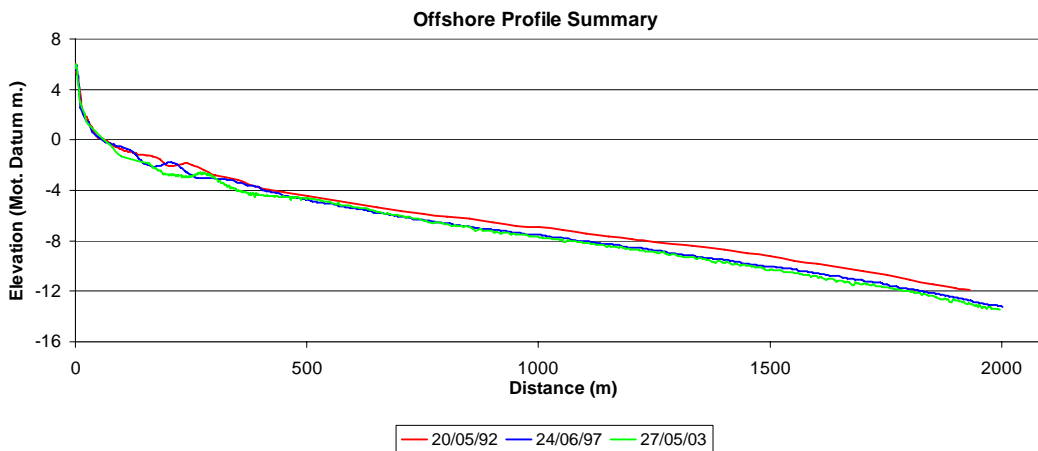
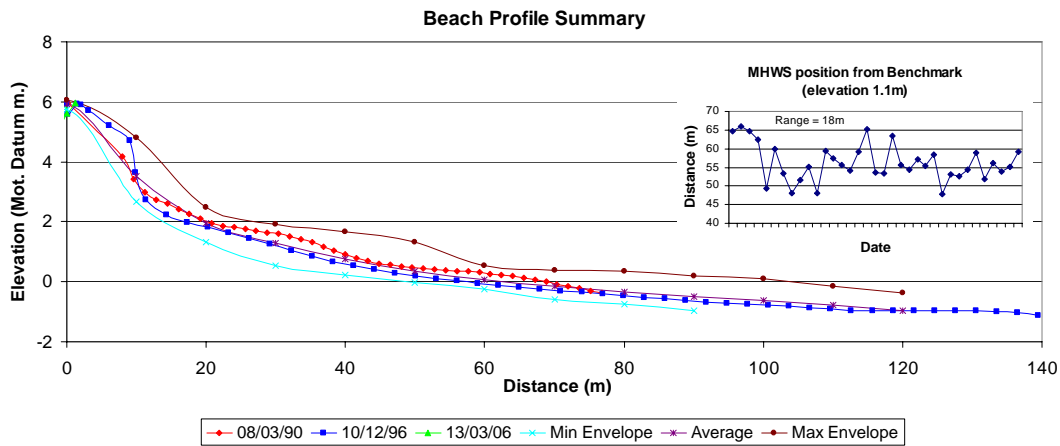
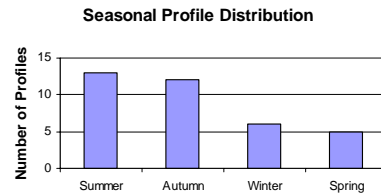
Location: NZMG 2771978E 6415346N

Period of record: 1990 – 2006

No. of profiles: 35

Morphodynamic type (Wright Short model): Longshore Bar and Trough

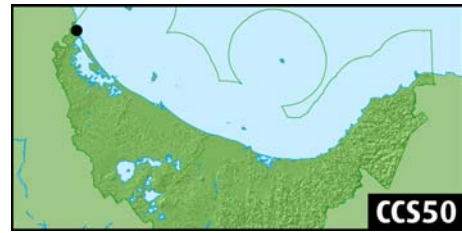
Volume p-level – 0.06 TOF p-level – 0.15



5.10.4 Waihi Beach Loop (CCS 50)

Discussion

This site is located 4km from Rapatiotio Point. The site is in front of the residential development at The Loop and is equidistant between Two and Three Mile Creeks. This section of beach has a several metre high rock revetment present (along with the remnants of an older timber wall) as shown in the 2006 photograph.



The profile history reflects the presence of this engineering works as a means of providing stability to the upper section of beach. As a result of the revetment the “dune” position has remained stable for the period of record. The vertical position of the mid to lower beach profile changes markedly as a result of negligible sediment transfer from the upper beach to maintain the equilibrium beach profile. The vertical envelope moves approximately 1.5m for this profile site. This movement means that during periods of lower beach elevation no dry beach is present during the upper portion of the tidal cycle.

The offshore profile record shows moderate bar development in the 1997 and 2003 profiles. These two profiles converge at -5m at a distance of approximately 500m from the shoreline.

The statistical tests give results indicating stability for this beach profile site.

No early photograph (1970's) is available for this site.



CCS 50 Waihi Beach Loop

State: Stable

Location: NZMG 2771362E 6416419N

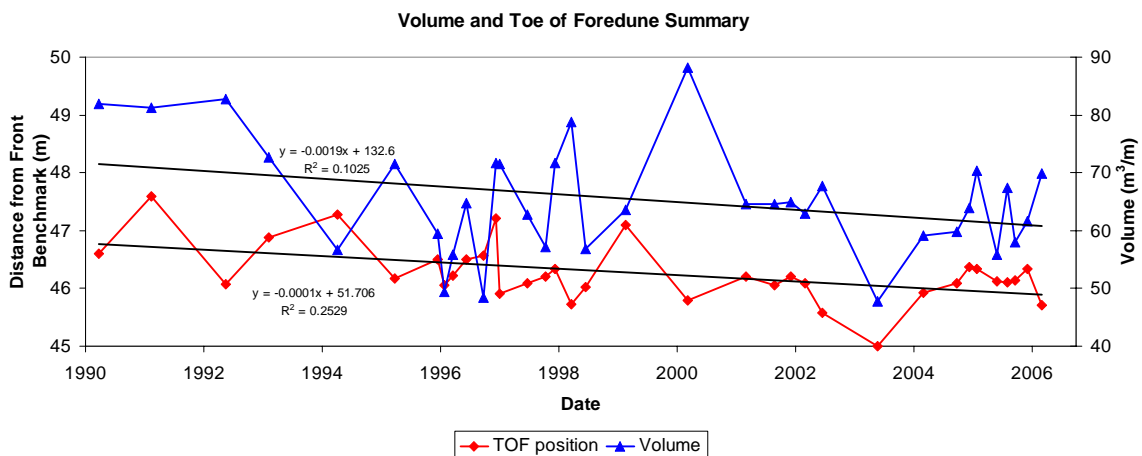
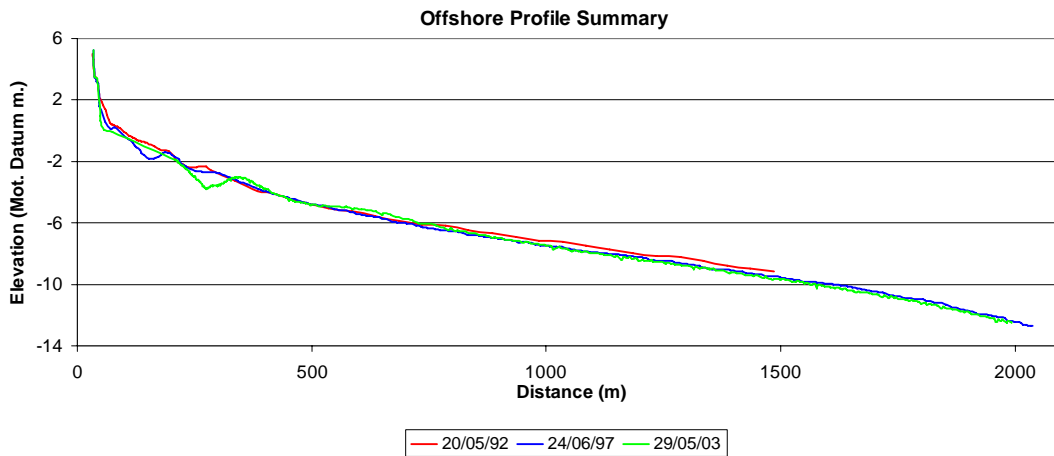
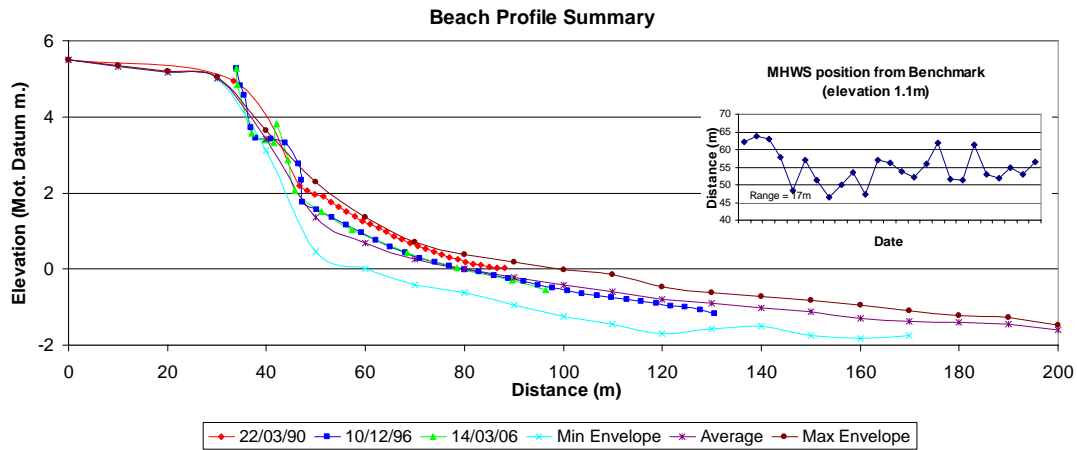
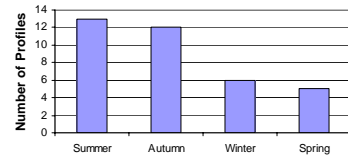
Period of record: 1990 – 2006

No. of profiles: 35

Morphodynamic type (Wright Short model): Seawall modified

Volume p-level – 0.06 TOF p-level – 0.00

Seasonal Profile Distribution



5.10.5 Waihi Beach North (CCS 51)

Discussion

This site is located at the southern boundary of the popular Waihi Beach. A 5 m high frontal dune is present at this site which is vegetated by a mixture of exotic and native species. An incipient dune has also formed and is presently colonised by a dense cover of spinifex. The 2006 photograph shows a 15m wide high tide beach.



The profile history shows a tight grouping of representative profiles for this site. The minimum envelope however highlights that at certain times this section of beach can exhibit a marked negative vertical translation. Lower beach features are typically subtle at this site with no prominent berm development evident in the record.

The offshore profile record shows strong similarity between the three measured surveys. The convergence of all three occurs 1km offshore at -6m. No dominant bar development is evident which is common for all the sites in the Bay of Plenty which are located in the lee of rocky headlands (i.e CCS11).

The toe of foredune position for this site has remained statistically stable for the last 16 years. This trend is also applicable to the beach volume timeseries, although more variation is exhibited, particularly during the period 1991 to 1995. This combined analysis gives an overall state of stable for this beach profile site.

No early photograph (1970's) is available for this site.



CCS 51 Waihi Beach North

State: Stable

Location: NZMG 2770479E 6418326N

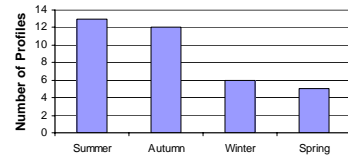
Period of record: 1990 – 2006

No. of profiles: 34

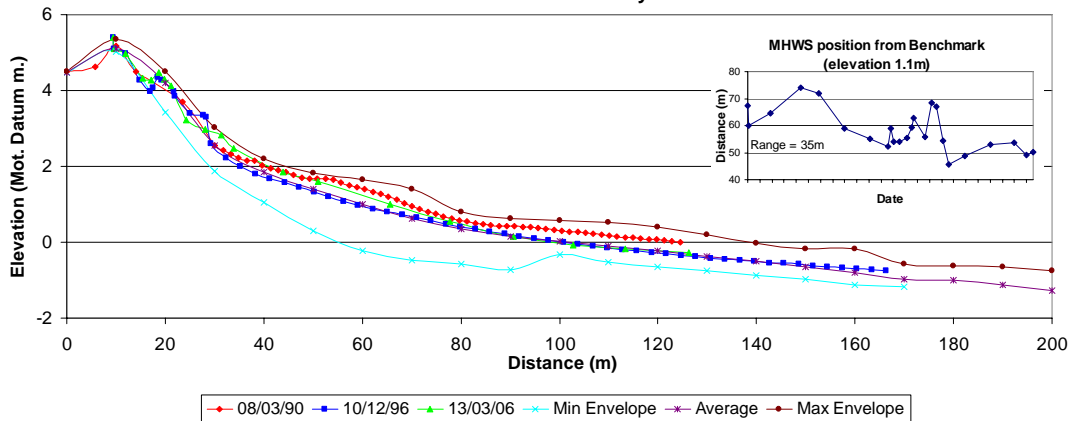
Morphodynamic type (Wright Short model): Dissipative

Volume p-level – 0.50 TOF p-level – 0.44

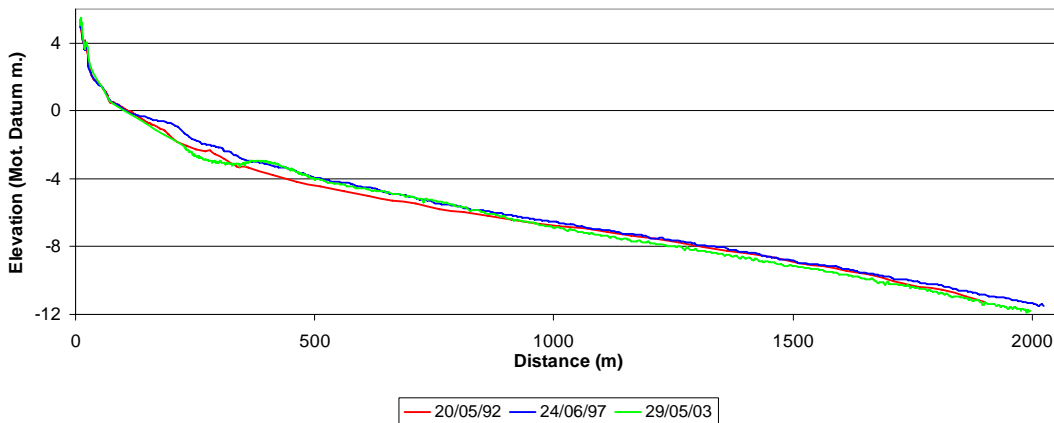
Seasonal Profile Distribution



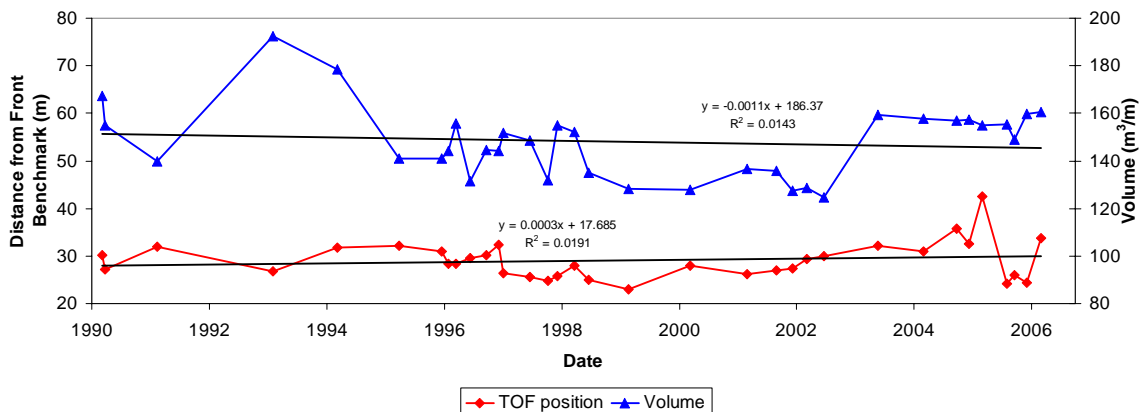
Beach Profile Summary



Offshore Profile Summary



Volume and Toe of Foredune Summary



5.10.6 Waihi Beach Surf Club (CCS 52)

Discussion

This site is located at Waihi Beach at The Esplanade. The site was installed in 1998 as part of a monitoring programme focussing on an area where significant Dune Care work was to be undertaken. The profile origin for this site is located in an area that has been fenced to deter human traffic and planted with a range of native species.



The profile history shows a low angle beach with no berm development. The frontal dune has undergone some change in shape due to the early Dune Care work. The envelope plots shows less than 1m of vertical movement in the upper beach profile, widening to 1.5m as the profile approaches MSL. The MHWS plot also reflects this variation with a period between 1999 and 2002 showing the 1.1m elevation to be in a more landward position, indicating a short period of sediment depletion.

No offshore profiles have been measured at this site.

The statistical analysis shows that for the toe of foredune position and the beach volume datasets there is a *pattern of stability* for the 8 years of record.



CCS 52 Waihi Beach Surf Club

State: Accretion?

Location: NZMG 2770380E 6418534N

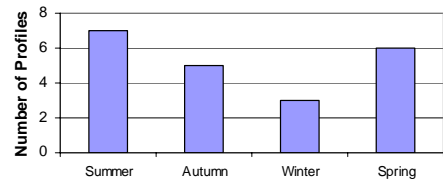
Period of record: 1998 – 2006

No. of profiles: 21

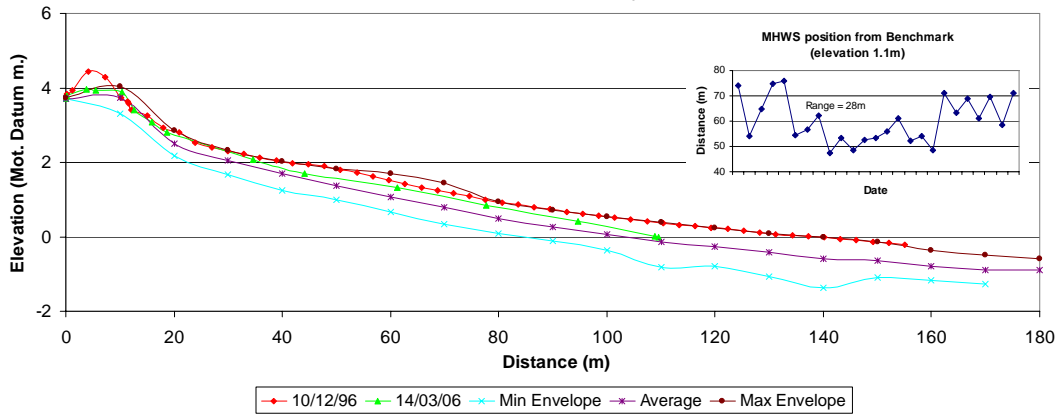
Morphodynamic type (Wright Short model): Dissipative

Volume p-level – 0.25 TOF p-level – 0.00

Seasonal Profile Distribution

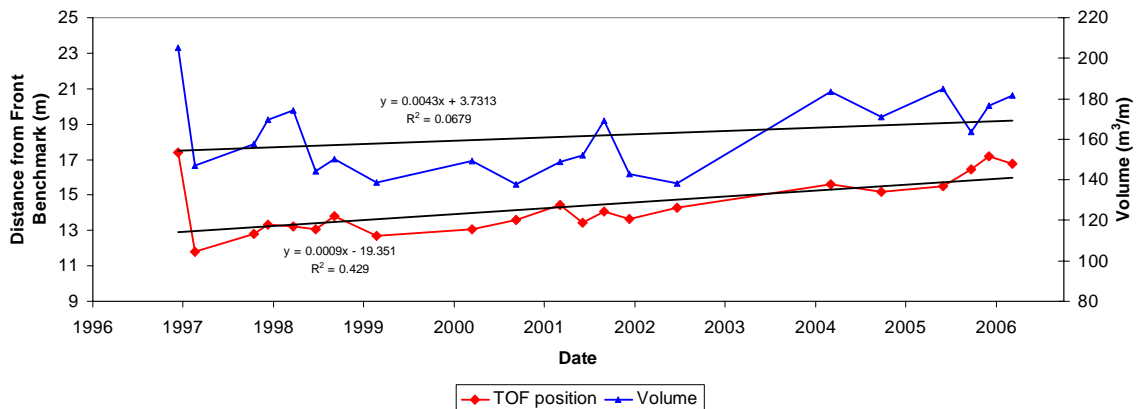


Beach Profile Summary



No offshore profiles have been measured at this site.

Volume and Toe of Foredune Summary



5.10.7 Waihi Beach Stream (CCS 53)

Discussion

This site is the western most of the beach profile monitoring sites. The site is located at the western end of The Esplanade on the eastern side of the small stream. Like CCS 52 this sites origin is located in a Dune Care fenced area planted with native vegetation.



The profile history shows the earthworks undertaken to develop a dune at the beginning of the Dune Care programme. As with the other two sites in this area the beach exhibits a low angle with a wide high tide beach present. No berm feature is present for the majority of the time although the maximum envelope plot does show evidence of sand accumulating in a berm shape approximately 70m from the benchmark.

No offshore profiles have been measured at this site.

The statistical analysis shows that for the toe of foredune position and the beach volume datasets there is a *pattern suggesting accretion* for the 8 years of record.



CCS 53 Waihi Beach Stream

State: Accretion

Location: NZMG 2770450E 6418040N

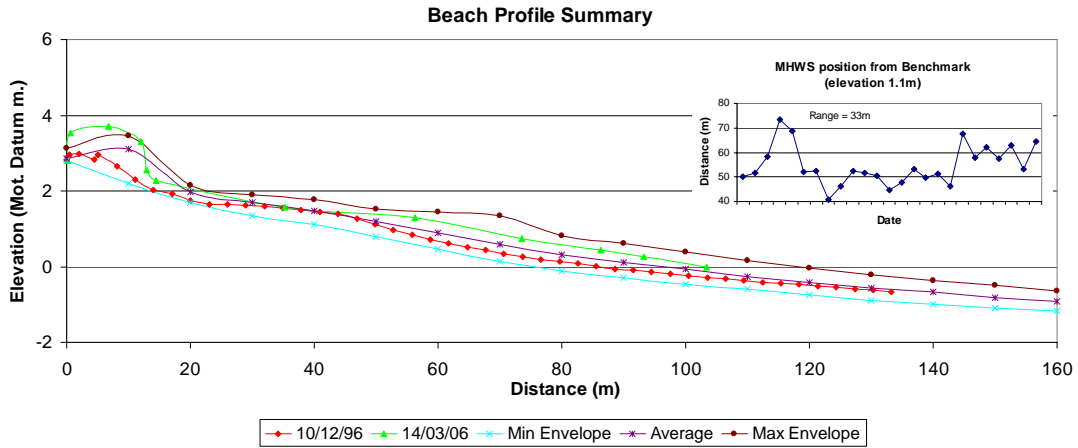
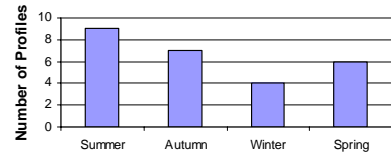
Period of record: 1998 – 2006

No. of profiles: 26

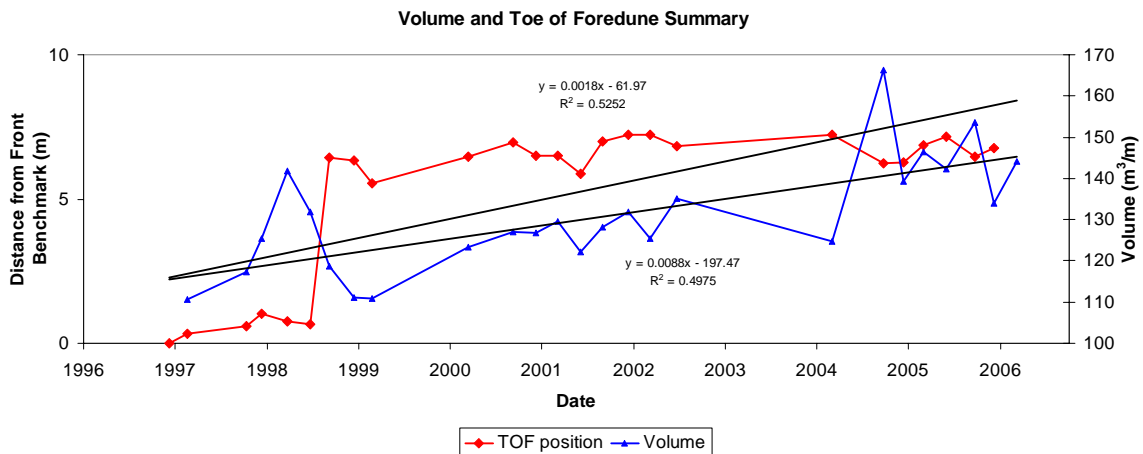
Morphodynamic type (Wright Short model): Dissipative

Volume p-level – 0.00 TOF p-level – 0.00

Seasonal Profile Distribution



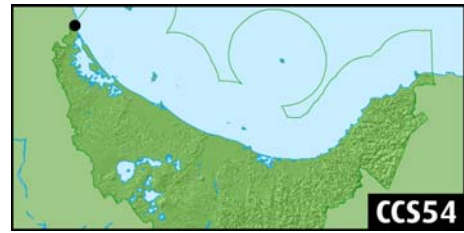
No offshore profiles have been measured at this site.



5.10.8 Waihi Beach Esplanade (CCS 54)

Discussion

This site is the western most of the beach profile monitoring sites. The site is located at the western end of The Esplanade on the eastern side of the small stream. Like CCS 52 this sites origin is located in a Dune Care fenced area planted with native vegetation.



The profile history shows the “earthworks” undertaken to develop a dune at the beginning of the Dune Care programme. As with the other two sites in this area the beach exhibits a low angle with a wide high tide beach present. No berm feature is present for the majority of the time although the maximum envelope plot does show evidence of sand accumulating in a berm shape approximately 70m from the benchmark.

No offshore profiles have been measured at this site.

The statistical analysis shows that for the toe of foredune position and the beach volume datasets there is a pattern of accretion for the 8 years of record.



CCS 54 Waihi Beach Esplanade

State: Accretion

Location: NZMG 2770230E 6418030N

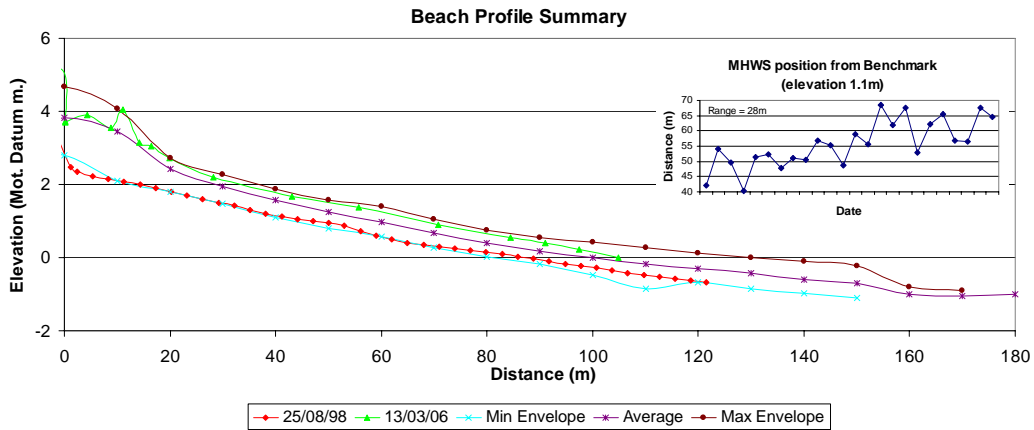
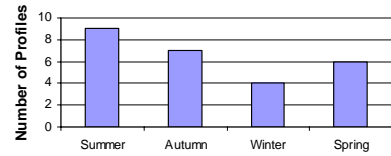
Period of record: 1998 – 2006

No. of profiles: 24

Morphodynamic type (Wright Short model): Dissipative

Volume p-level – 0.00 TOF p-level – 0.00

Seasonal Profile Distribution



No offshore profiles have been measured at this site.

