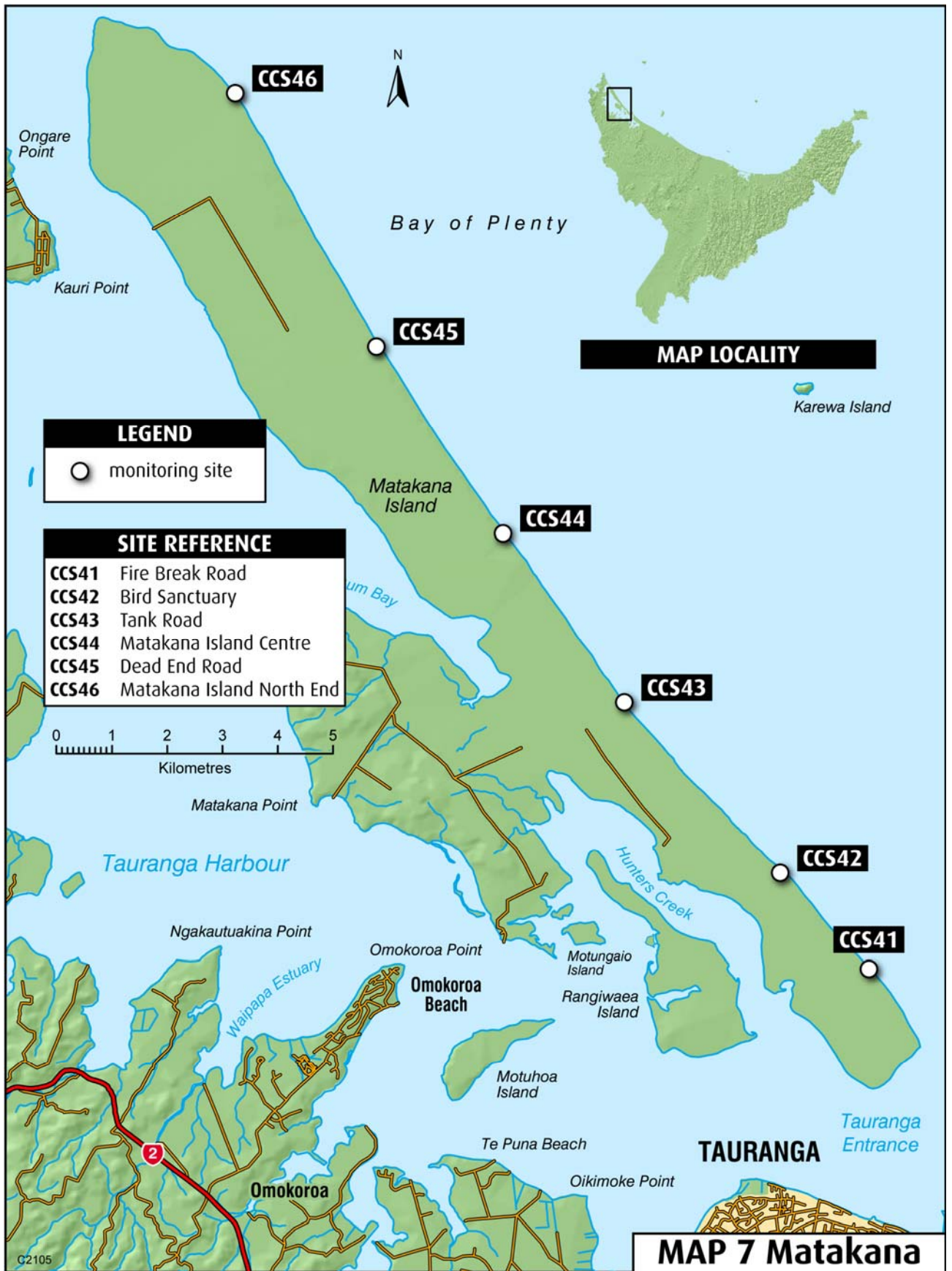


### 5.9 Matakana Beach system



### 5.9.1 Fire Break Road (CCS 41)

#### Discussion

This site is located 2km from the Tauranga Harbour tidal inlet at the southern end of the barrier island. The physical characteristics of this site are dominated by the ebb tidal delta and the sediment transfer between this delta and the adjacent open coast beach. The island is dominated by exotic forestry on the open coast side. This forestry occupies land right to the seaward edge of the frontal dune. In many places the foredune has been altered by trees falling onto the upper beach section.



Due to access issues and the lack of residential development on the open coast side of the barrier this site has only been profiled annually (typically in March).

The nearshore beach profile record shows a low tide terrace form. The early 1992 profile shows a very well developed berm which becomes absent in the later two representative profiles (1996 and 2006). These later profiles show a stable upper beach but a marked loss in the swash zone for the 1996 profile, with a steepening in this zone. The 2006 profile shows a recovery although the profile stops short of the MSL position. The MHWS position plot shows a variation on elevation of 31m over the 16 year period. These trends show that sediment supply at this site is dynamic and a result of exchanges with the nearby ebb delta.

This pattern of sediment flux is further reinforced by the offshore profile record with striking changes occurring to the seaward extent of each of these profiles. The 1992 profile shows an abrupt elevation decrease at 1600m. Variations in the profiles occurs all the way to 2500m (elevation -12m) unlike other sites along the coast where changes are less detectable once an elevation -8m is reached.

The trends in the toe of foredune position and beach volume are not statistically significant leading to a stable beach state. The toe of foredune position exhibited a strong seaward movement from 2000 to 2003 with a positional change of approximately +15m.

No photography is available for this site.

# CCS41 Fire Break Road

**State: Stable**

**Location:** NZMG 2788155E 6392681N

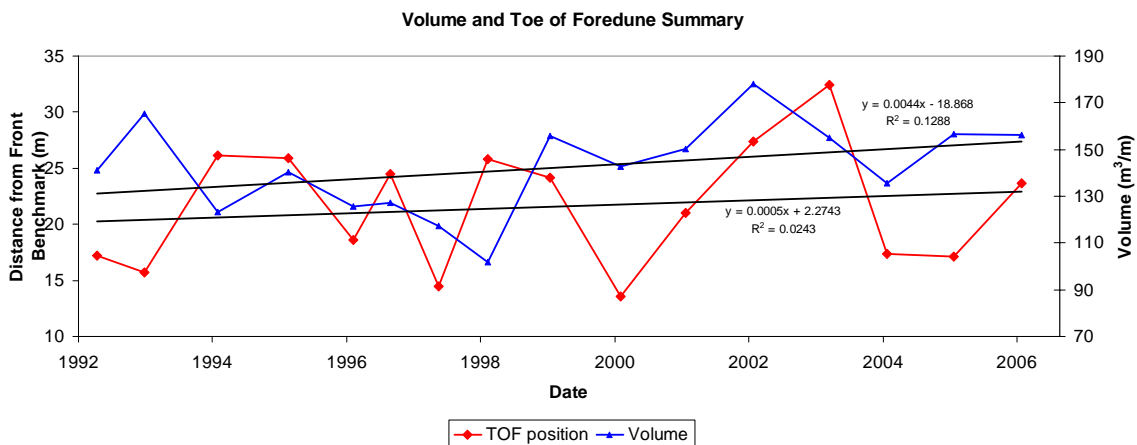
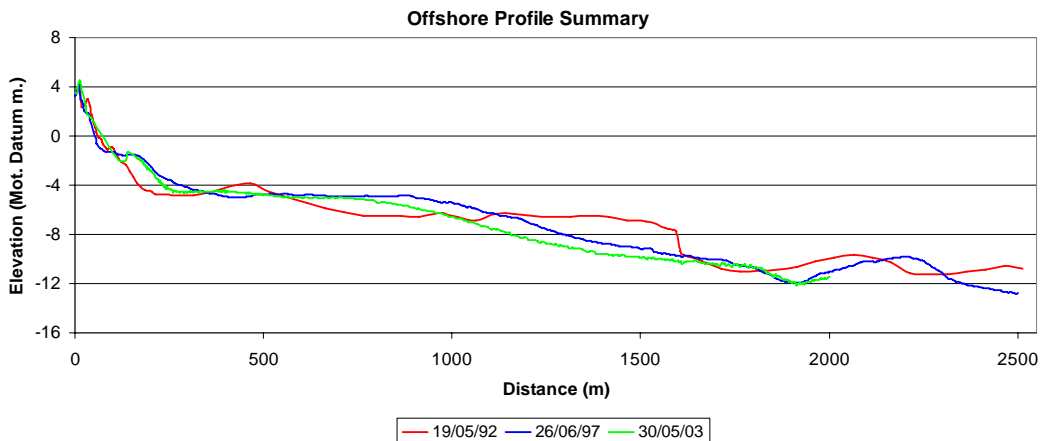
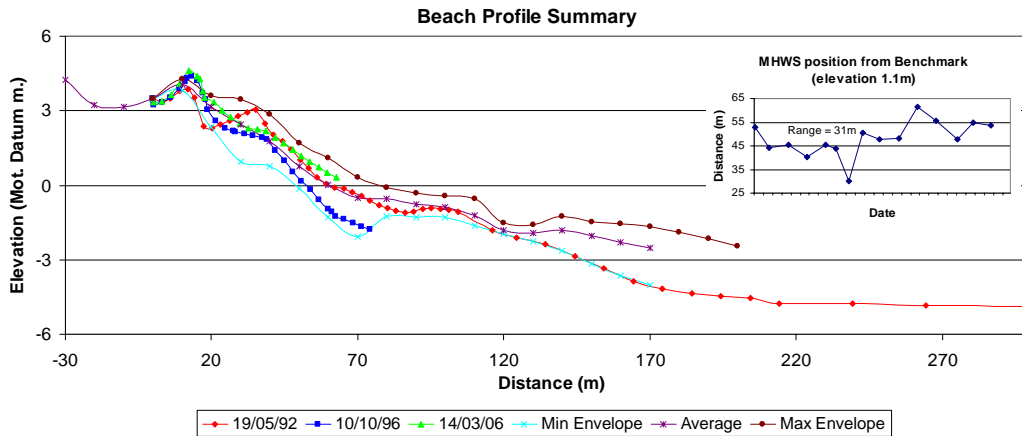
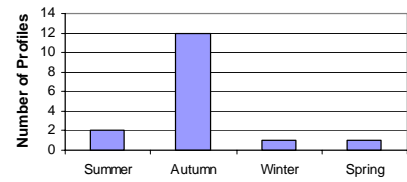
**Period of record:** 1992 – 2006

**No. of profiles:** 16

**Morphodynamic type (Wright Short model):** Low Tide Terrace

**Volume p-level – 0.17      TOF p-level – 0.57**

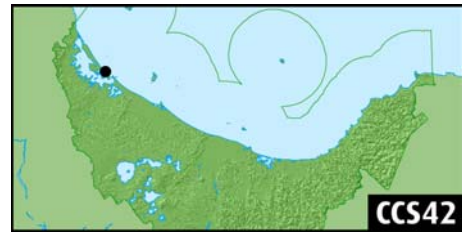
Seasonal Profile Distribution



### 5.9.2 Bird Sanctuary (CCS 42)

#### Discussion

This site is located 4km from the Tauranga Harbour tidal inlet. Like CCS41 and the other four sites on the barrier, this site is backed by exotic pine forestry.



The profile history plot shows a pattern of erosion, with 40m of landward movement of the foredune. The MHWS position shows a range of 49m of movement. The envelope plots show this section of beach to be in its most landward position for the 14 years of measured record.

The offshore profiles show a large dominant offshore bar structure which varies in position by several hundred metres. The size of this bar is a reflection of the state of the upper beach (erosional) and would be partially affected by sediment supply for the tidal delta. The 1992 profile diverges at depth suggest erroneous data for the seaward section. The 1997 and 2003 profiles converge at a depth of -8m, 800m offshore.

The statistical analysis shows strong test results for both beach volume and toe of foredune position, coupled with negative slopes; the resulting trend for this profile section is one of erosion.

No photography is available for this site.

# CCS 42 Bird Sanctuary

State: Erosion

Location: NZMG 2786546E 6394424N

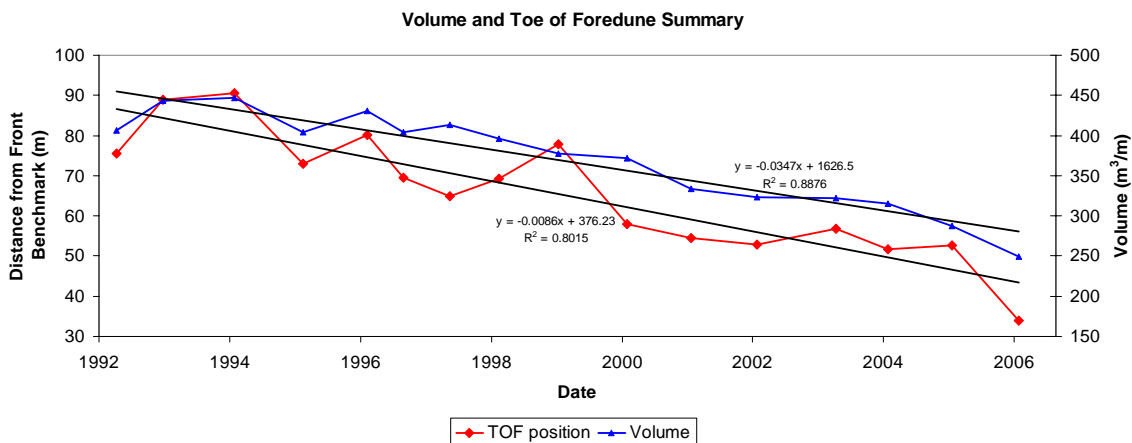
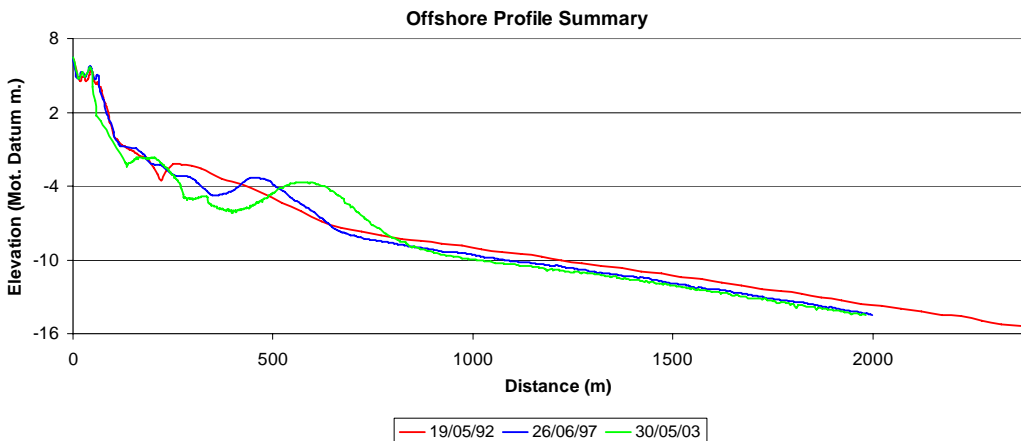
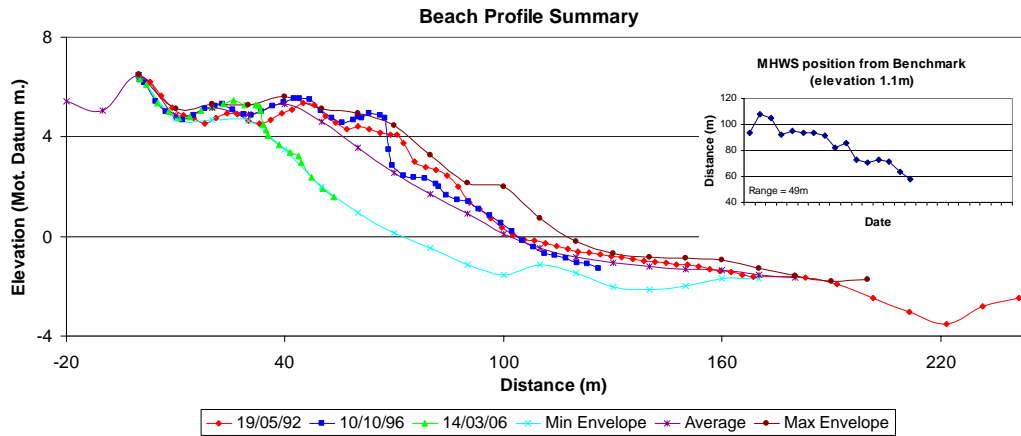
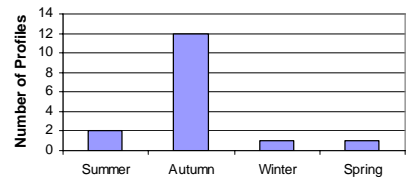
Period of record: 1992 – 2006

No. of profiles: 16

Morphodynamic type (Wright Short model): Transverse Bar and Rip

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

Seasonal Profile Distribution



### 5.9.3 Tank Road (CCS 43)

#### Discussion

This site is located 7km from the Tauranga Harbour tidal inlet in the middle section of the barrier.



The profile record for this site shows a reversal of the patterns exhibited by CCS42. The latest 2006 profile shows the beach to be at its most seaward position in the last 14 years although the profile finishes unusually short of the normal minimum MSL finishing position. The 1996 profile is the most landward position in the recorded dataset following a period of erosion where the berm and mid beach zone experienced sediment loss. The MHWS position plot also reflects this trend but more recently is showing a positive seaward position.

The offshore profiles show similar patterns and slopes for the entirety of the measured section (up to 2km offshore). Slight divergence at depth is shown in the 1992 plot. Convergence of all three profiles occurs shortly after the less dynamic offshore bar section approximately 500m offshore at a depth of approximately -6m.

The statistical analysis of the volume record and toe of foredune position indicates a *state heading towards accretion*. The test result for the volume is strong coupled with a positive regression slope. The variability in the toe of foredune position results in a less significant test result.

No photography is available for this site.

### CCS 43 Tank Road

State: Accretion?

Location: NZMG 2783722E 6397525N

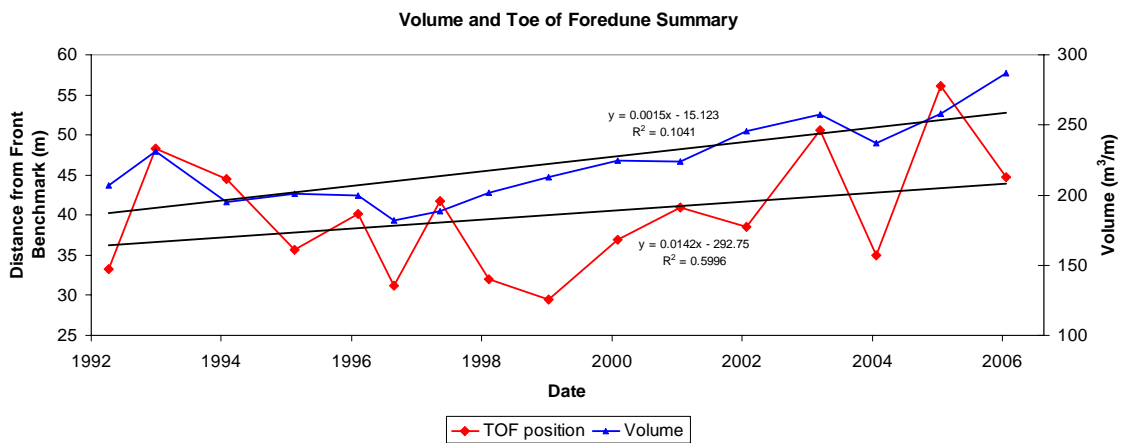
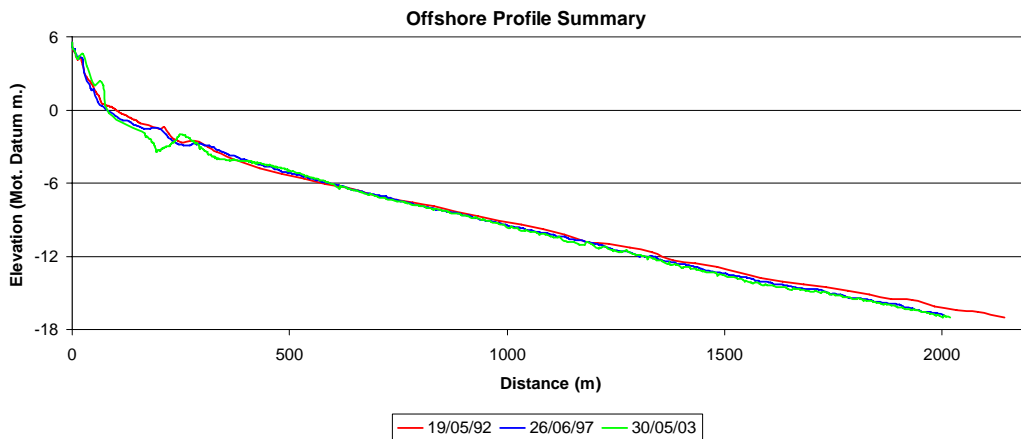
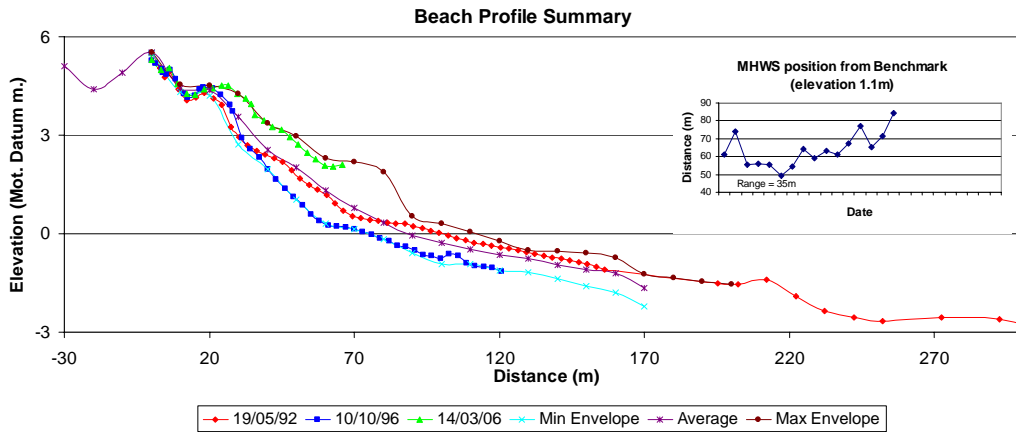
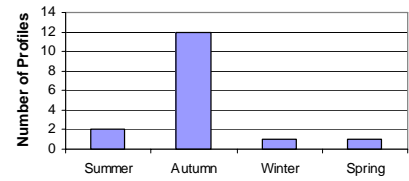
Period of record: 1992 – 2006

No. of profiles: 16

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

Volume p-level – 0.00 TOF p-level – 0.22

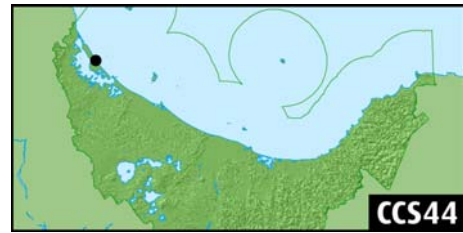
Seasonal Profile Distribution



#### 5.9.4 Matakana Island Centre (CCS 44)

##### Discussion

This site is located 12km from the Tauranga Harbour tidal inlet in a central position along the barrier island.



The profile history shows a tighter grouping of profiles with less variability at this site when compared with sites to the east on the barrier island. The 2006 profile is the most seaward of the recorded dataset.

The offshore profiles also reflect this pattern of low variability; once again the 1992 profile diverges with depth and should thus be used with caution. The 1997 and 2003 profiles mirror each other for the entirety of the profiles out to the endpoint at ~2000m offshore. Only slight offshore bar development is shown to occur at this site and is a reflection of the stable nature of the onshore profile sections.

Statistical p-tests and also regression analysis shows that this section of beach is in a stable state.

No photography is available for this site.

# CCS 44 Matakana Island Centre

State: Stable

Location: NZMG 2781534E 6400587N

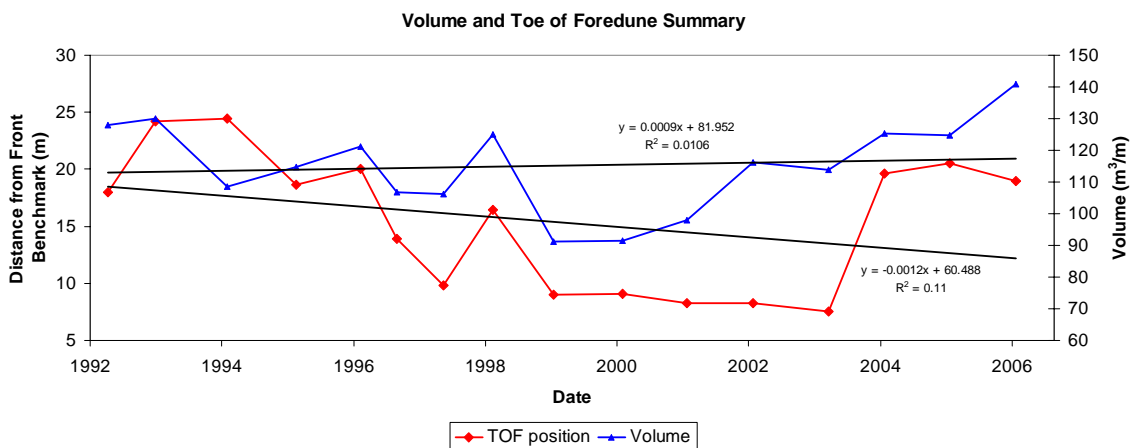
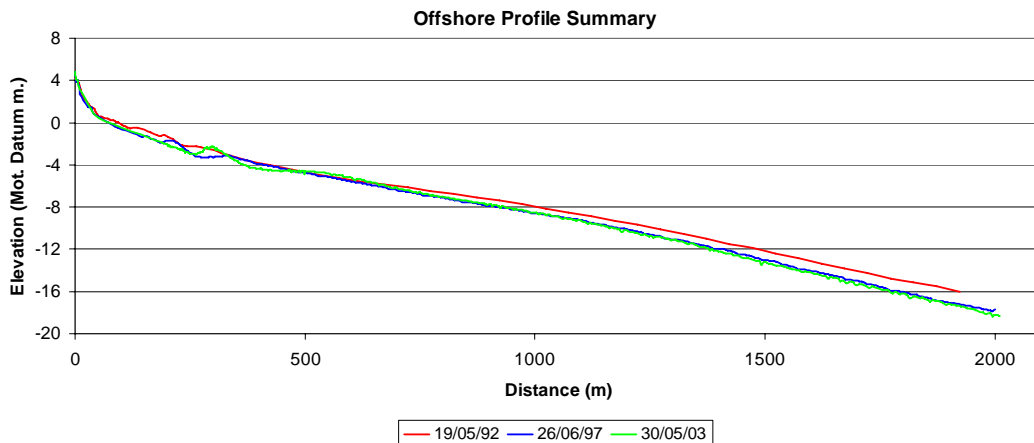
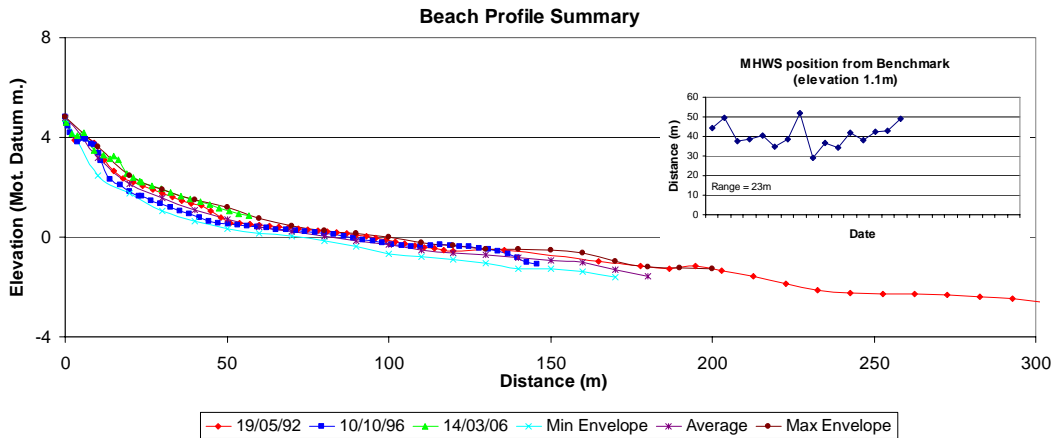
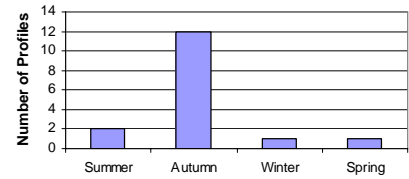
Period of record: 1992 – 2006

No. of profiles: 16

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

Volume p-level – 0.71 TOF p-level – 0.29

Seasonal Profile Distribution



### 5.9.5 Dead End Road (CCS 45)

#### Discussion

This site is located 7km from the Tauranga Harbour northern entrance at Bowentown.



The profile history shows a tighter grouping of profiles with less variability at this site when compared with sites to the east on the barrier island. The 2006 profile is the most seaward of the recorded dataset.

The offshore profiles also reflect this pattern of low variability. All three profiles converge at -7m. Interestingly they then diverge at 1200m and continue to for the remainder of the measured profile. Only slight offshore bar development is shown to occur at this site and is a reflection of the stable nature of the onshore profile sections.

Statistical p-tests and also regression analysis shows that this section of beach is in a *stable state*.

No photography is available for this site.

# CCS 45 Dead End Road

**State: Stable**

**Location:** NZMG 2779249E 6403986N

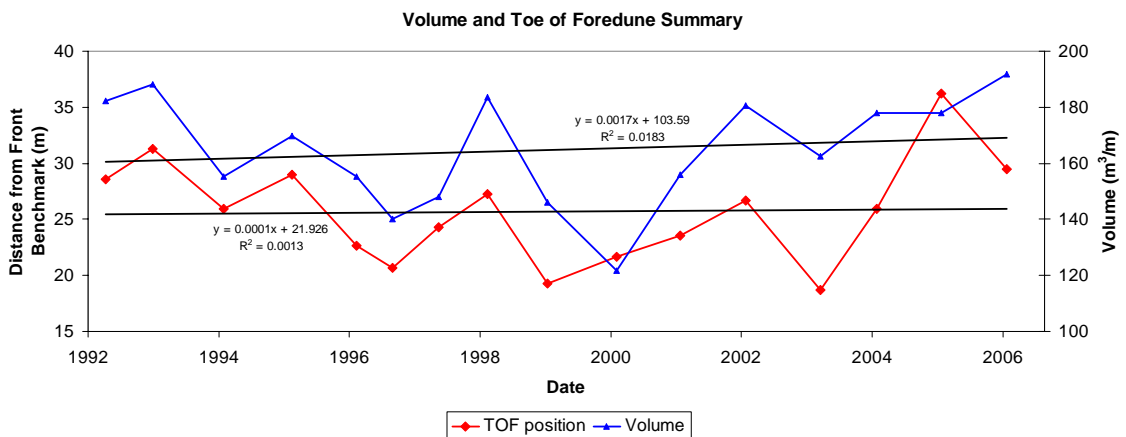
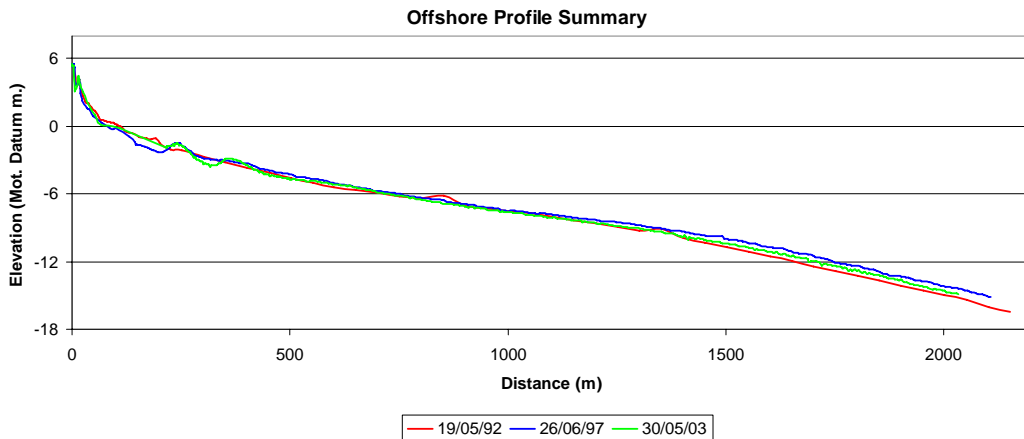
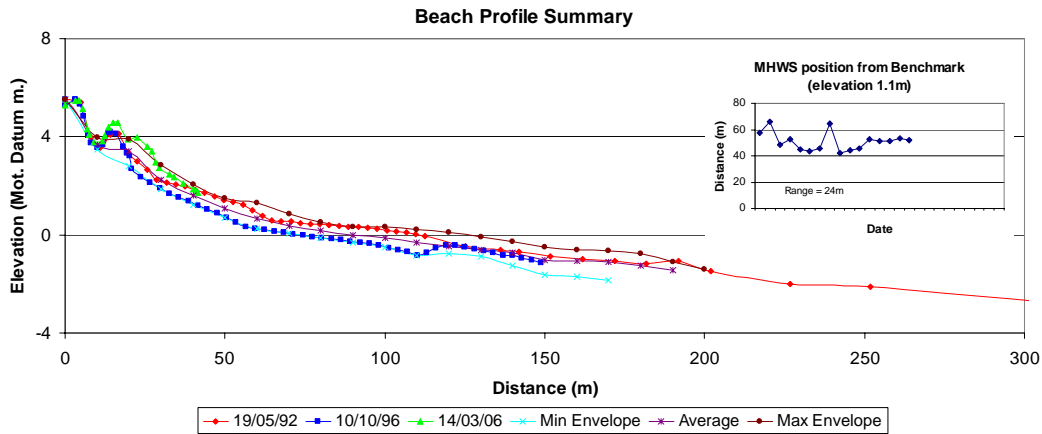
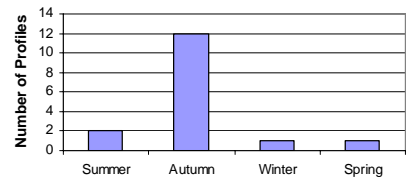
**Period of record:** 1992 – 2006

**No. of profiles:** 16

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

**Volume p-level – 0.62      TOF p-level – 0.90**

Seasonal Profile Distribution



### 5.9.6 Matakana Island North End (CCS 46)

#### Discussion

This site is located 3km from the Tauranga Harbour northern entrance at Bowentown. The site is affected by the tidal inlet and the dynamic nature of the associated ebb tidal delta and the eastern orientated lateral channels that develop. The geology of the headland provides a nature barrier and restriction to any movement of the entrance to the northwest. This restriction means often tidal flows are directed towards the monitoring site.



Gibb (1994) states that this 3km-long sand beach borders Holocene sand dunes at the Katikati entrance to Tauranga Harbour. The foredune is 30 to 50m wide and decreases in height westwards from 4.8 to 2.5m above MHWS. Subject to wind erosion, overtopping and inundation from storm wave runup of 4 to 6m and the effects of channel migration near the entrance. Long-term trend (1923-1994) of shoreline advance of 55 to 60m, reversing to a trend of shoreline retreat of 65 to 140m at the entrance. Short-term shoreline fluctuations increase from 30 to 50m, up to 150 to 300m near the entrance in response to channel migration.

The profile history at this site shows a landward retreat for the 14 years of measurements. The magnitude of this retreat is approximately 70m. The 1992 profile shows the presence of a developed berm, this feature however has been lost from the two other representative profiles as the beach undergoes rapid and dominant erosion.

The offshore profiles show a very active offshore bar region to 900m offshore. This offshore section would bisect the eastern edge of the ebb tidal delta. The convergence of all three profiles occurs at approximately -8m.

Statistical analysis shows strong negative trends for both parameters giving an overall *state of erosion* for the period of record.

No photography is available for this site.

### CCS 46 Matakana Island North End

State: Erosion

Location: NZMG 2776685E 6408571N

Period of record: 1992 – 2006

No. of profiles: 16

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

Volume p-level – 0.03 TOF p-level – 0.12

