

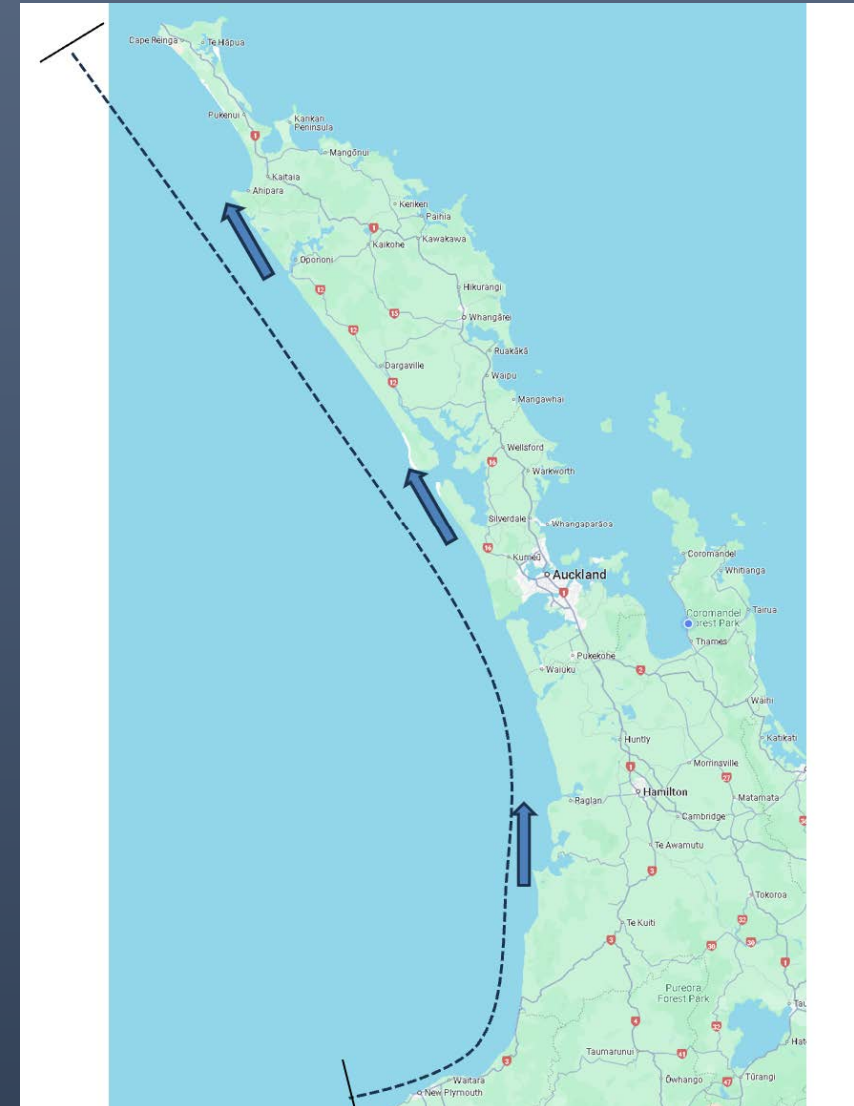
Coastal Erosion Ocean Foreshore: Port Waikato:

Presentation to Port Waikato Beachfront Landowners:
30 August 2024

Jim Dahm, Eco Nomos Ltd

Setting - Open West Coast Beaches

- High wave energy
- Wide, low gradient sandy beaches
- Part of a HUGE Inter-connected sand system - extending from Taranaki to Cape Reinga
- Waves result in net northerly longshore sand transport over time
- Sand appears to often travel in “slugs” or pulses of sediment (small to very large)
- Shorelines can experience significant changes over time scales up to centuries - complex
- Much uncertainty. Much of the science of the coast not yet done



Port Waikato Sand Spit – Ocean Coast Shoreline Change 1940s to Present

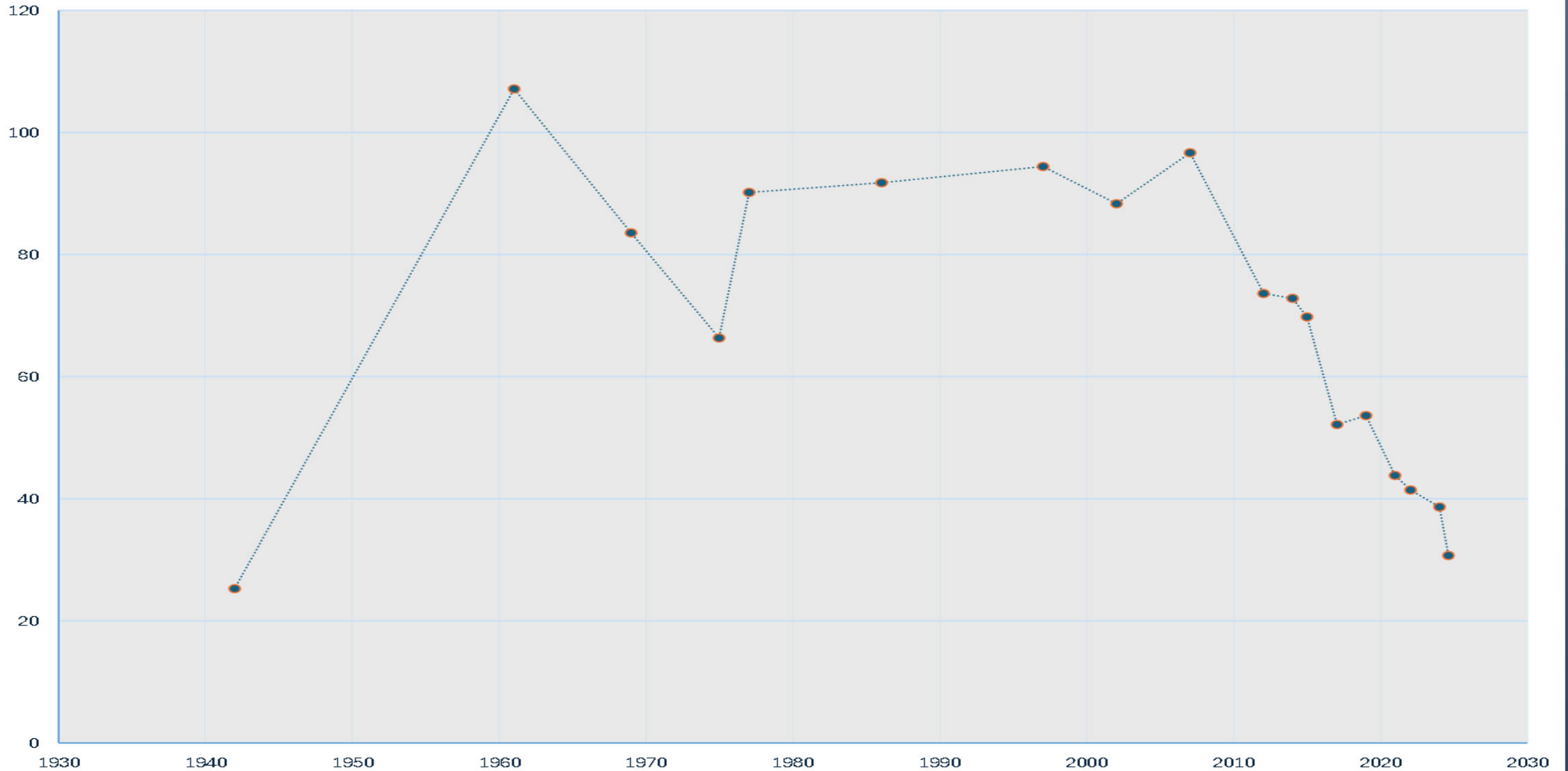
Shoreline change 1942-2007 on early 2024 Aerial



Shoreline change: Township: 1942-early 2024

Port Waikato Carpark – Shoreline Change 1942-2024

Port Waikato Carpark - Average Shoreline Change 1942-2024 (Draft)



Shoreline Changes 1940s to Present

1942 to 1960s

- advanced by 70-80 m (typically about 70m)
- *May have started advancing before 1942 (no data earlier)*

1960s to 2008 (46-47 years)

- Some fluctuations but typically remained 60-70+ m seaward of 1942 position

2008 to Present (Aug 2024)

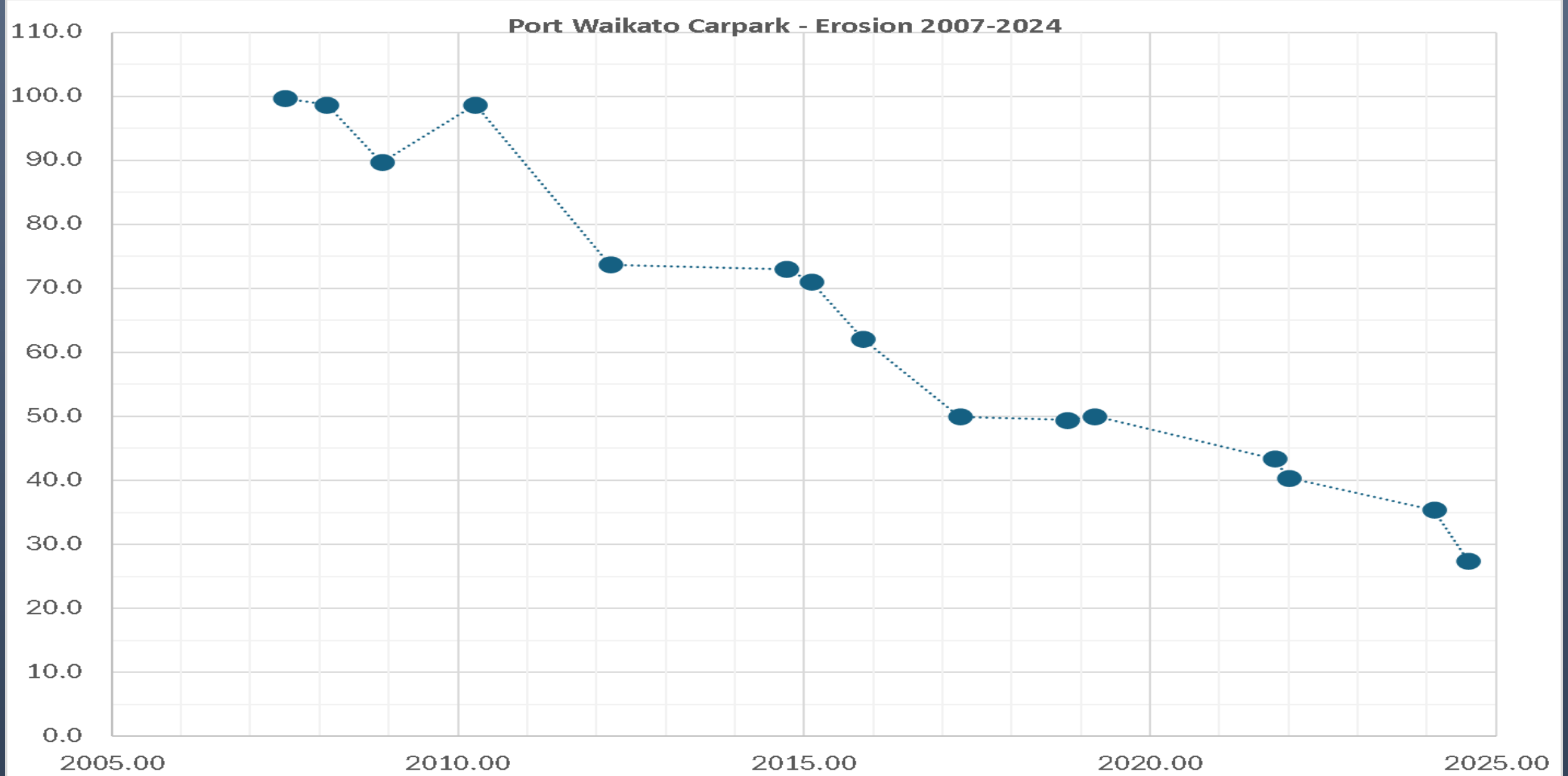
- Rapid erosion
- Now just seaward of 1942 position
- Scale of the erosion is fairly consistent along the entire ocean foreshore

Cause of these changes is uncertain. However, overall, it has the appearance of a large slug/pulse of sediment moving northwards

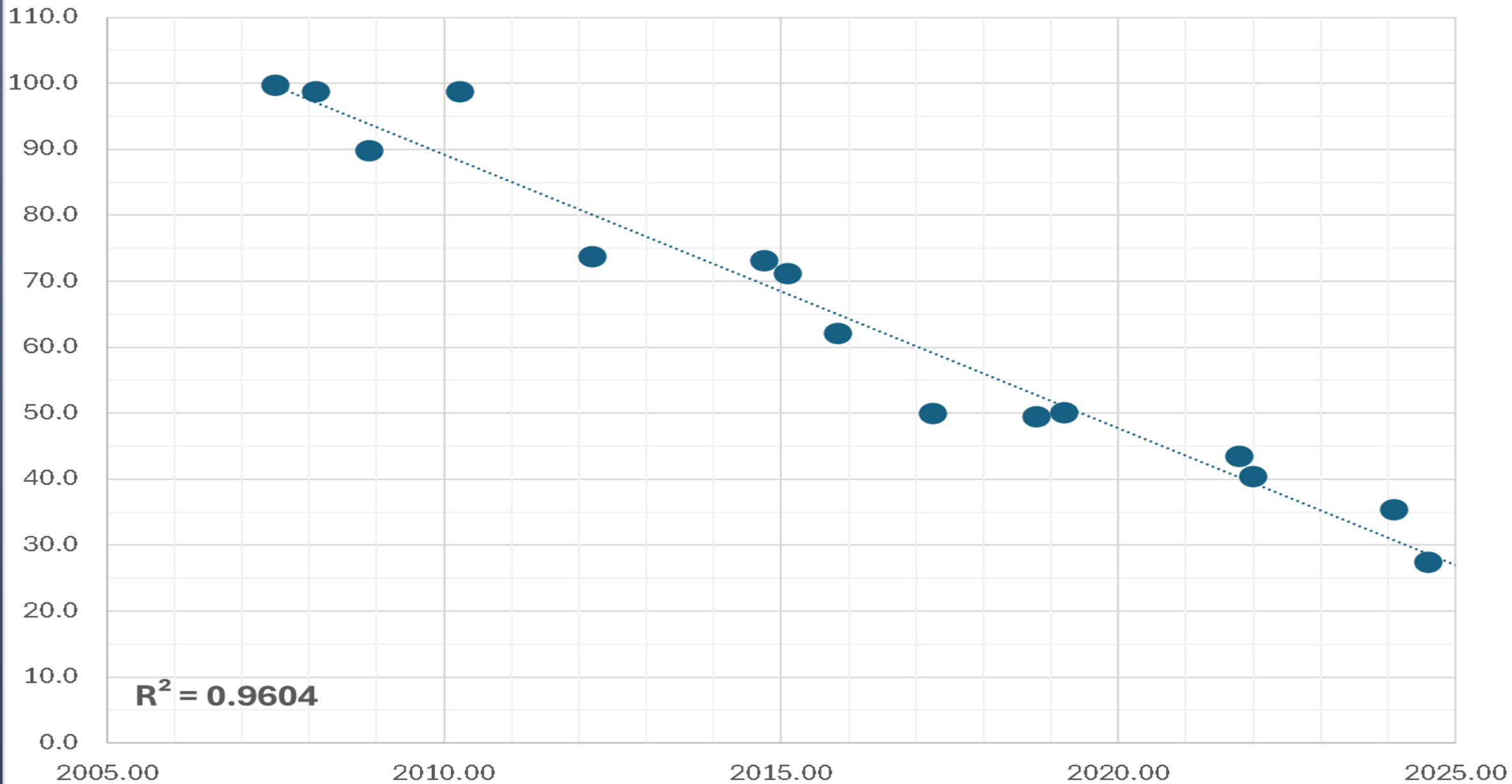
Port Waikato Township
Coastal Erosion 2008-to Present

Shoreline change: Township: 1942-early 2024

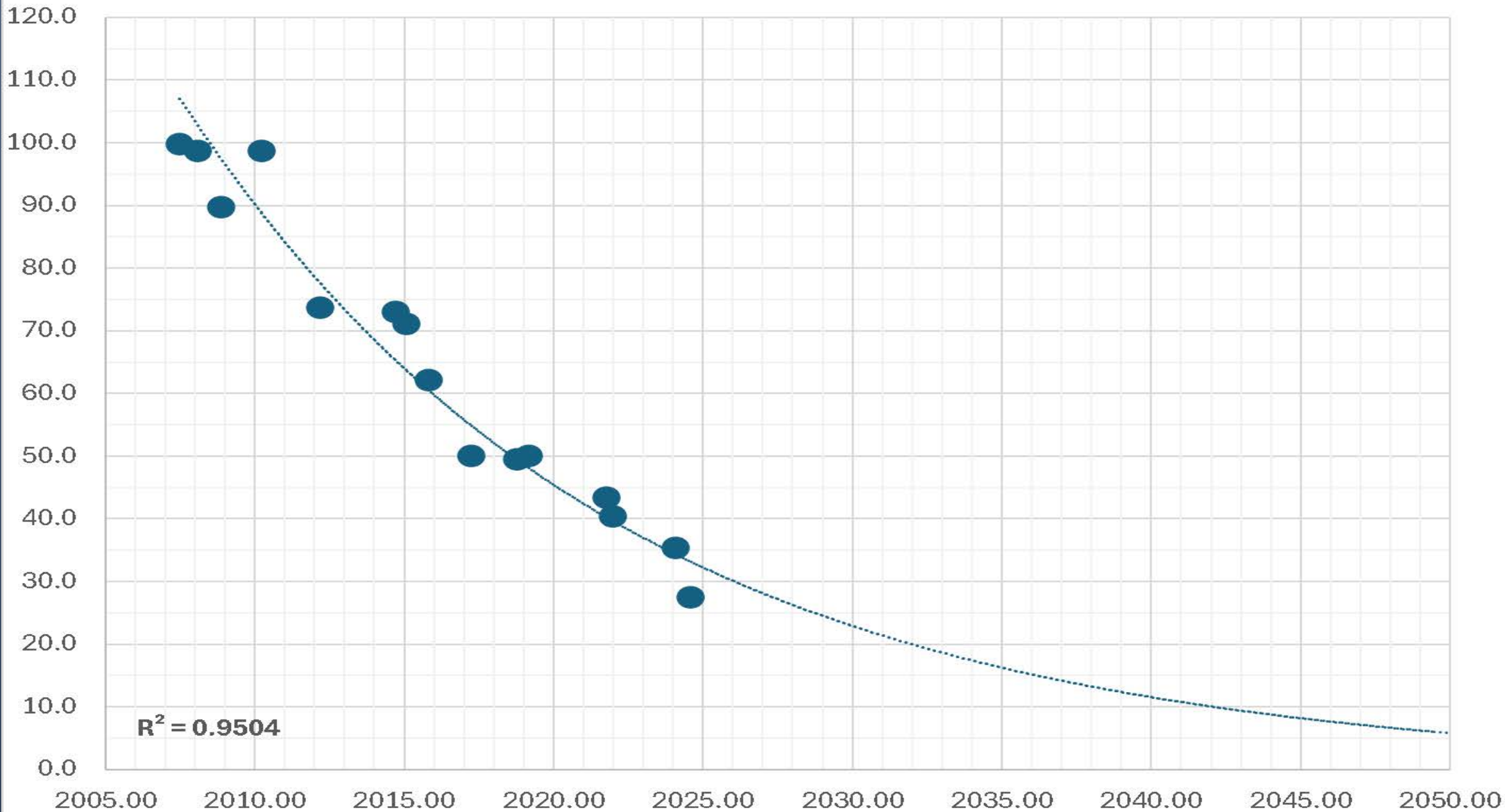
Port Waikato Carpark – Erosion 2008/10-2024 (DRAFT)



Port Waikato Carpark - Erosion 2007-2024: Best Fit Linear (Draft)



Port Waikato Carpark - Erosion 2007-2024: Best Fit Exponential (Draft)



Port Waikato Township Erosion: Summary 1

- Rapid erosion (about 70m) since 2008/11 – similar scale along the entire ocean shoreline of the spit (about 3.4 km length)
- Erosion occurred in phases during which periods significant erosion can occur (e.g. about 20-25m in 2-3 years)
- Interspersed with quiet periods (often 2-3 years) with little to no erosion
- Average rate of erosion is still high, though may be decreasing

Port Waikato Township Erosion: Summary 2

- Future projections based on existing data
 - Projections, not predictions (i.e. based on extrapolating past trends)
 - **“Worst likely”** – erosion at same average rate as the last 15-17 years
 - Projects average erosion of 4m/yr for periods of 5 years or more
 - For periods <5 years, need to allow for erosion phases
 - **“Best likely”** – erosion is decreasing over time
 - But still projects at least 15-20m further erosion before 2050
 - Can't rule out a better outcome – but no evidence for this at present
 - Still finalising these projections – above figures are DRAFTS
 - **Monitoring is important – refine/improve projections over time**

Port Waikato Carpark - Erosion Projections: Present "Worst Likely" and "Best Likely" (DRAFT)

