

Low Lying, Late Quaternary, Marine Terraces of Cape Liptrap, Australia

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Cape Liptrap presents an interesting problem because it sits on a passive continental margin but displays features that are indicative of a tectonically active region. The predominant tectonic features that are present are uplifted marine terraces and faults. It is necessary to determine what process is causing uplift and deformation of these terraces because their existence challenges current ideas about the tectonic setting of Cape Liptrap. Marine terraces form at sea level. They are formed as sand and pebbles abrade a rocky shoreline by wave action. Clasts wear away the rock at sea level and create flat or gently sloping platforms. The specific character of these platforms depends on the rock type that is being eroded, the amount of time that relative sea level remains constant and the force of the wave action that is causing the erosion. Raised terraces were caused by uplift of the land or a drop in sea level or a combination of the two. It is important to determine whether the land level rose or the sea level fell or if both occurred.

The two low lying raised marine terraces of Cape Liptrap present evidence for recent tectonic deformation on the Australian passive Margin. The oldest terrace (terrace 1) was formed 122 ± 13 ka and the youngest terrace (terrace 2) was formed $5,570 \pm 40$ yBP. One hundred twenty two thousand years ago sea level was approximately 5.5 meters higher than it is today. The terrace that formed at that time must have been horizontal at + 5.5 m. Presently, that terrace can be observed at 7.25 m and 2.1m. The deformation in this area is centered around the Waratah Fault which creates a gentle anticline. It is causing subsidence in throughout the area evidenced by its being found around 4m. The deformation caused by the fault is more exaggerated in the northeast part of Cape Liptrap. On the Yanakie isthmus subsidence is apparent as the 122 ka terrace is found at 2.1m above sea level, meaning that the area has subsided 3.4 m from 122 ka.

Terrace 2 that was given an isotopic date of $5,570 \pm 40$ yBP and was found at 2 meters above sea level. Near the Liptrap Fault it was found at a little over 3 meters above sea level revealing deformation in the area. There is evidence from many locations around Australia for a ~2m sea level highstand at approximately 6,000 yBP indicating that there has been little deformation of this terrace on Cape Liptap. This terrace was not observed on the Yanakie Isthmus and it can be inferred that if the terrace was formed in the area during the 6000 yBP highstand it would now be submerged. The extent of this submersion could show the temporal extent of deformation by the Waratah Fault before and after the 6000 yBP highstand.