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## Ground Penetrating Radar of a beach ridge system on Phra Thong Island, Thailand reveals repeat Late-Holocene tsunami events on a background of falling sea level

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This study examines ground penetrating radar (GPR) records of beach ridge stratigraphy as a proxy for reconstructing regional sea-level and tsunami histories in the tropics. We present topographically corrected GPR profiles on a prograded coast in Phra Thong Island, Thailand where we 1) identify downlap points marking the boundary between foreshore / beachface and upper shoreface facies and use this as past sea-level marker and 2) identify 'cut and fill' packages in the upper fill that we infer to be records of past erosion and recovery following repeated tsunami events. Optically Stimulated Luminescence (OSL) dates collected at locations slightly offset from the same profile line were incorporated to create the temporal record. The shore-normal GPR record shows ~0.82 m fall in the sea-level between 2659±139 years BP to 367±27 years BP that is consistent with other proxy based sea-level curves obtained in the region. The early part of the record (before ~2600 years) presents a period of rapid progradation and relatively stable sea level conditions. From ~2600 years BP to ~2200 years BP the record shows a steeper fall in sea level followed by a relatively stable to slightly falling phase between ~2200 years BP and ~550 years BP. Finally, for the seaward side, between ~550 years BP and ~350 years BP, the record indicates falling relative sea-level. The cut and fill packages suggest that Phra Thong has experienced 5 tsunami events in the last 2600 years including two events in close succession around 500 years ago that are recorded in the most landward part of the sequence. This study confirms that the study of tropical beach ridge systems using GPR and OSL techniques can be highly effective for reconstructing regional sea-level trends and tsunami histories through the Common Era and beyond.