## **Thames-Coromandel District SMPs** What are our Coastal Hazards?

The hazards that have been examined in more detail as part of this exercise are coastal inundation and coastal erosion. Key processes associated with coastal inundation and coastal erosion hazards are illustrated here. Information on tsunami, cliff/slope instability and flooding hazards can be found at tcdc.govt.nz/coastal (see the SMP Scoping Report).

**Coastal inundation** occurs due to several oceanic processes (shown) below) that cause sea levels to increase over short time frames (hours to days) due to tides and storms (see Fact Sheet #3) and over long time frames (decades) due to sea level rise (SLR) (see Fact Sheet #4). These processes are different between the Coromandel Peninsula's east coast region, that faces the Pacific Ocean, and west coast, within Hauraki Gulf/Firth of Thames.

The different components of measured sea level, namely the predicted astronomic tide, storm surge (SS) and sea level anomaly (SLA), are illustrated



in the figure below. While the August 2009 storm surge ranked as a 5 year annual recurrence interval (ARI) event it occurred during neap tides and hence measured sea level was not significant (see Fact Sheet #4).



**Coastal erosion** is caused by wave attack on the beach, dunes and cliffs, particularly when sea levels are high (high tides coupled with storm surge). The energy from large waves is released in the nearshore zone as waves break and 'runup' the beach. Depending on their size, breaking waves can exert significant forces capable of eroding sand (transporting it offshore) and cliffs, relocating large boulders and damaging any infrastructure.



The cross-shore location of the beach-profile and shoreline, and their movement associated with sea level rise, long-term landward retreat (recession) and storm erosion events is illustrated here.

Whangapoua before and after a storm in 2008. View looking from centre of beach on June 2007 before the storm and after on November 2008 (images from Dahm and Gibberd, 2009).

