

Coastal Response to Sea Level Rise

Coastal response to changing sea levels will have strong geographic variation due to differences in morphology, affected by geology, tide, waves and relative supply of sediment. Evidence of different modes of coastal response to sea level rise is available from stratigraphic sequences, combined with modern observations of coastal dynamics.

Conceptual models for coastal response to sea level rise remain under scientific development, with most projections based on simpler sediment dynamics than demonstrated by nature.

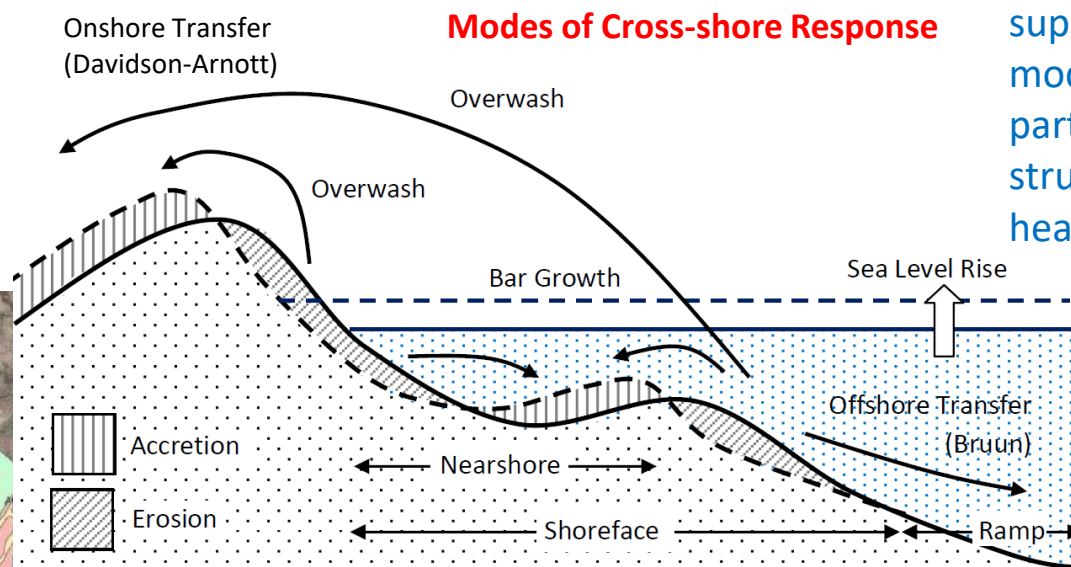
Two widely used conceptual models are developed through assumption that the coast will respond through cross-shore adjustment. Response to both models is influenced by coastal geometry, but in both cases, it is typically in the range of 25-100 m of coastal retreat per metre of sea level rise.



The assumption of cross-shore response is not supported by either stratigraphic sequences or modern observations of coastal change, particularly where there are geological structures causing compartments (e.g. headlands or substantial reefs).

Localised response to sea level rise is also expected to occur where coastal landforms facilitate sediment supply or storage, including nearshore sandbars, estuaries and tidal creeks. Estuaries without sufficient marine sediment influx will 'drown'.

Response of coastal dunes to sea level rise may involve breaching of low dunes, or reactivation of aeolian transport for larger dunes, with consequent sediment loss from the beach.



Cross-shore adjustment to sea level rise is potentially enhanced where nearshore features substantially affect the distribution of wave energy over the shoreface, including reef-protected shores, wide sub-tidal terraces or perched beaches.

