

# Storm Erosion and Recovery



Erosion and recovery cycles occur on sandy coasts as a result of variation in weather and tidal conditions. During storms large quantities of sand can be rapidly removed from the beach and dune, with subsequent slower recovery occurring under less energetic conditions.



onshore. Often >50% of beach erosion is recovered within 1-2 weeks. Sometimes high tides are needed to fully rebuild the beach elevation.

Dune recovery is slower, usually through wind-blown transport and typically 1-5m<sup>3</sup>/m per year. It can take years or even decades to recover after a severe storm.

Sand moved further away, into bars, offshore, or around headlands, does not return directly. In these situations, beach recovery is often reliant on seasonal alongshore sediment transport.



Prediction of erosion hazard often uses cross-shore models, such as SBEACH, based on equilibrium profiles and wave energetics.

However, storm processes can also include:

- Transfer into nearshore bars
- Onshore movement through wave runup
- Alongshore sand transfer
- Offshore deposition through rip currents
- Bypassing around headlands or structures

The relative importance and 3-D spatial distribution of processes varies with coastal morphology, including presence of rock.

Recovery speed is influenced the location where sand was moved to and energy available in non-storm conditions.

Beach profile flattening typically recovers rapidly, with background swell pushing sand



Assessment of sand redistribution after a storm can suggest likely rates of recovery and indicate potential need for coastal management responses.

During severe storms, erosion can cause 20 to 200m<sup>3</sup> loss of beach and dune per metre along shore. Much of this is due to beach face flattening. Storm erosion over 1-2 days can be substantial compared with typical seasonal rates of littoral drift.