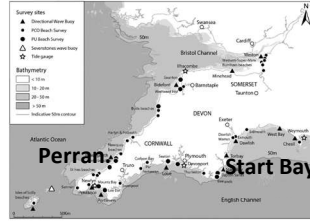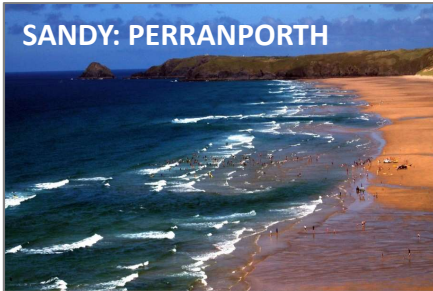# Observational Research on Sandy and Gravel Beaches

Why observe our beaches? In order to predict coastal response to extreme storms and long term change.

Locations: **Sandy** and **gravel** beaches are important beach types on the UK coast, exemplified by Perranporth and Start Bay.

SANDY: PERRANPORTH

GRAVEL: START BAY

- **Location:** Cornwall, exposed north coast, 3.5 km long embayment, with rocky cliffs and large dunes.
- **Sediment and morphology:** Medium sand, wide dissipative beach with rip channels at low tide.
- **Waves**: High-energy (average >2 m in winter), shore-normal (wave crests parallel to shore).
- **Impacts:** Extreme winter storms, erode beach and dunes. Only 50% recovery since 2013/14 storms.

- **Location:** Devon, east-facing 10 km embayment, including Slapton Sands, barrier and lagoon system.
- **Sediment and morphology:** Gravel, mostly 2 mm – 1 cm. Steep, often narrow beach
- **Waves:** Moderate (0.5-1 m), with bi-modal storms (westerly and easterly) up to 4 m. High wave angle to shore.
- **Impacts:** Long term alongshore sediment movement (south to north), extreme erosion at Hallsands, damage to seawall at Torcross, widening of beach at Blackpool Sands.

Ongoing Survey Program: Multi-method surveys at regular intervals to capture beach erosion and accretion.

Topographic Surveys (monthly)

Drone surveys (6 monthly)

Single-beam bathymetry (quarterly)

Multibeam Bathymetry (annual)

Storm surveys: High intensity hydrodynamic and morphological observations to identify key processes.

- **Acoustic Doppler Current Profilers (ADCPs)**
- **Pressure Transducers**
- **Video**
- **High-frequency topographic surveys**

Outcomes: Time-series' of morphological change are compared to wave forcing, and merged bathy-topographic data are used to generate conceptual models of erosion and recovery for different beach types.
By understanding beach response, we can better prepare for future impacts.

Scott *et al.* (Marine Geology, 2016)