Coastal Monitoring Update

Clive Moon

Principal Engineer (Coastal & Flood Risk Management)

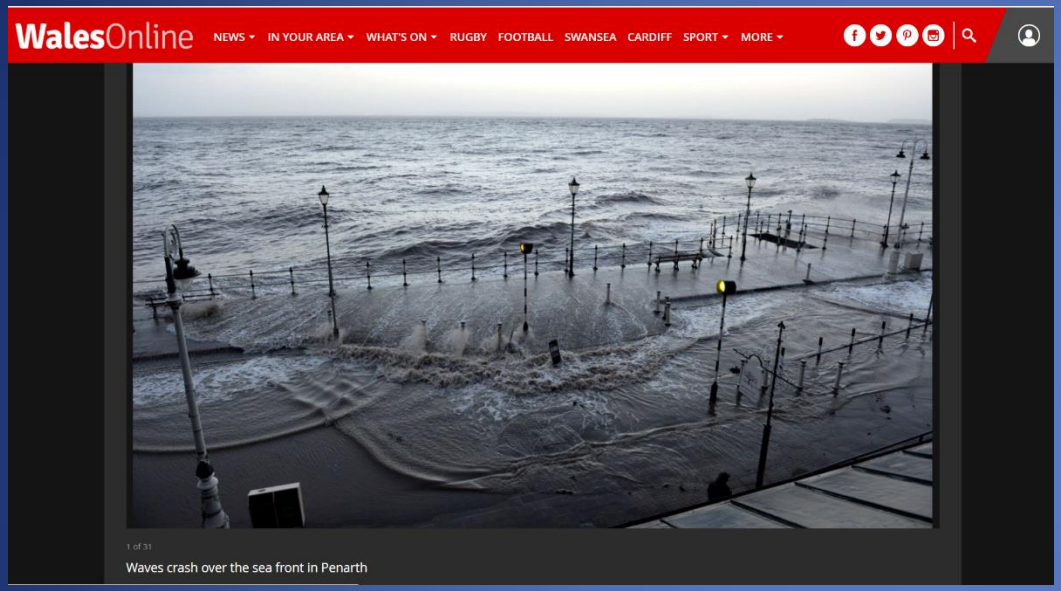
Coastal Monitoring

- Background to monitoring
- Summary of monitoring techniques
  - Topographic profile surveys
  - Drone Surveys
  - LiDAR Surveys
  - Multi-beam Bathymetric Surveys
- Localised sites
- Future Aims

Background to Monitoring

- Various roles and responsibilities:
  - Lead Local Flood Authority
  - Coastal Erosion Risk Management Authority
  - Landowner
  - Highway Authority
- 45 kilometres of coastline
- Predominantly cliffed coast line
- Developed areas focus of monitoring

Background to Monitoring



https://www.walesonline.co.uk/incoming/gallery/storms-hit-the-welsh-coastline-6467593

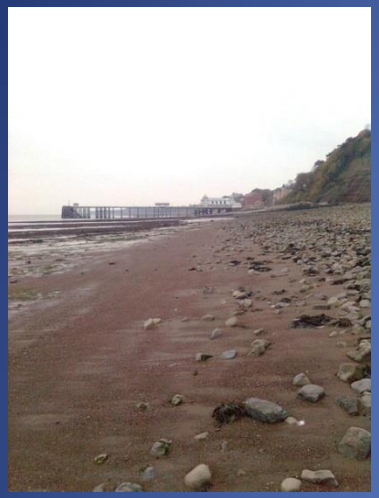
http://www.bbc.co.uk/news/uk-wales-15629729

Background to monitoring

Beach Profile Locations

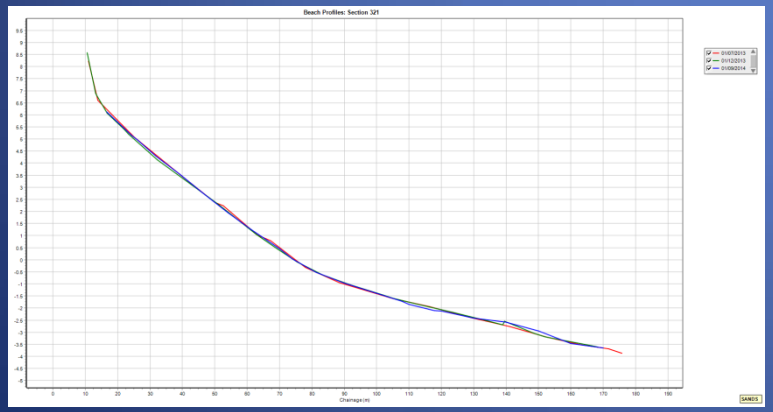
Topographic Beach Profile Locations

RTK-GPS topographic profiles



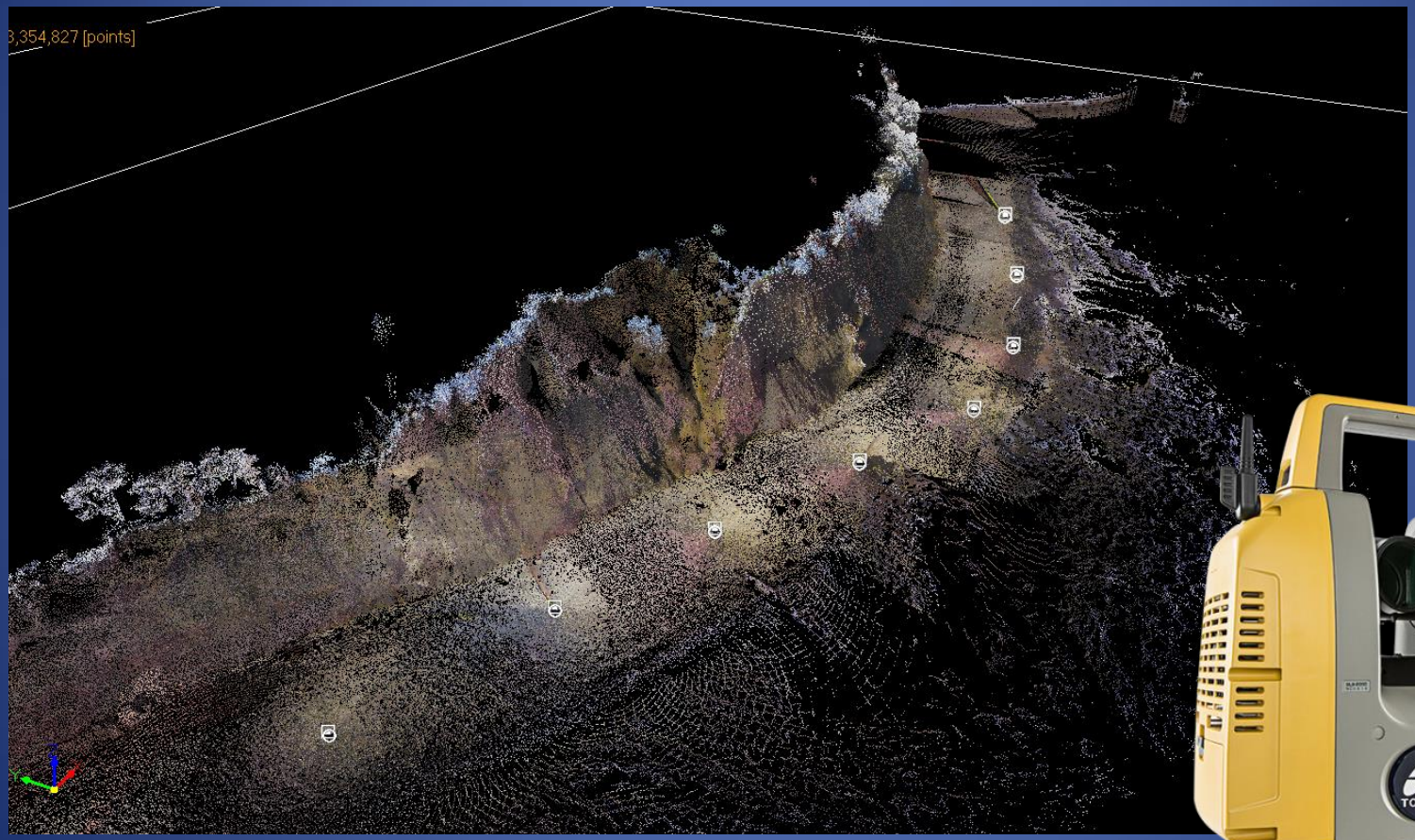
Beach profile photographs

Image courtesy Channel Coastal Observatory © NFDC



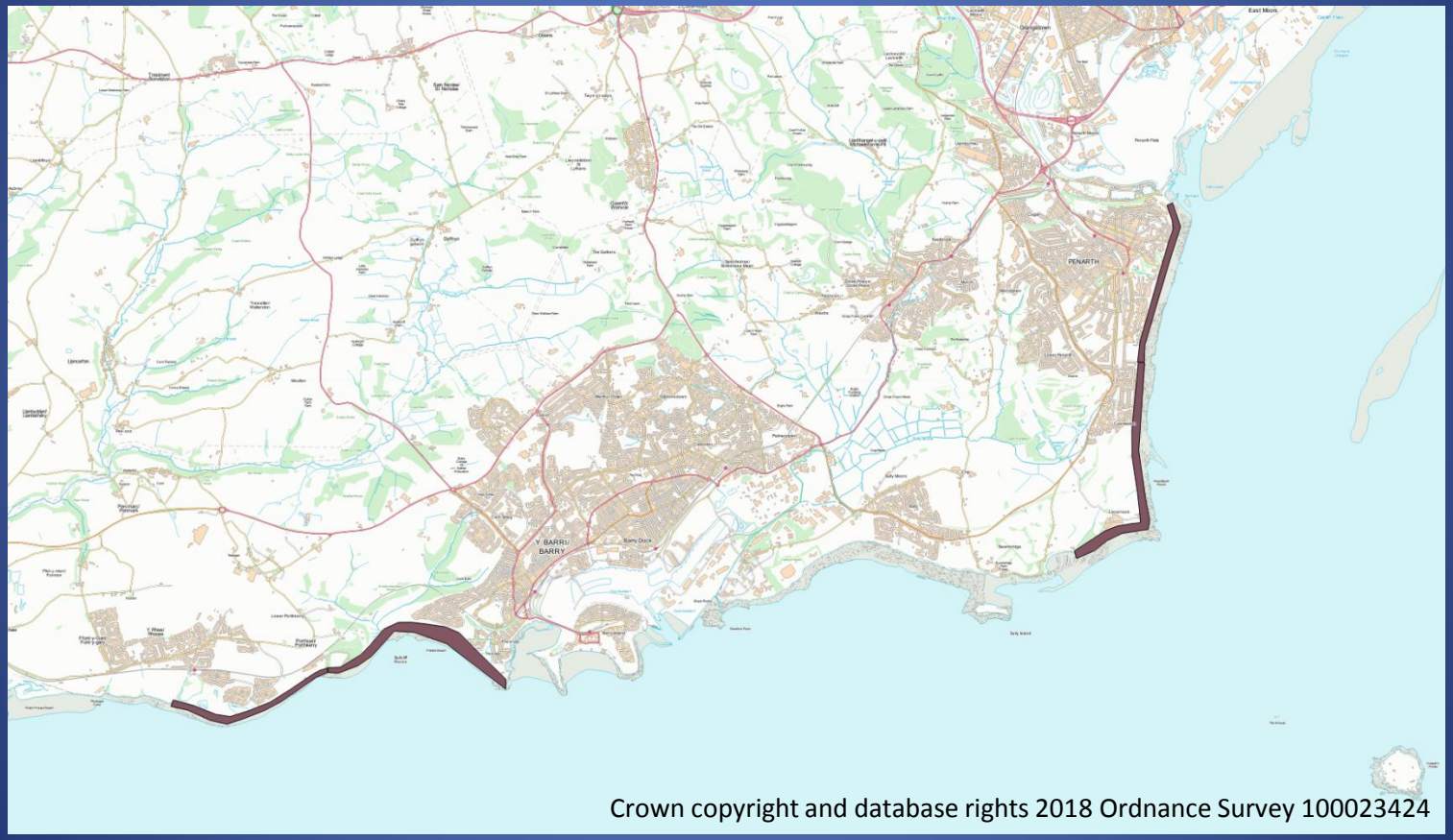
SANDS – Beach profile analysis

Terrestrial Laser Scanner



Penarth Head (2016)

UAV / Drone Surveys



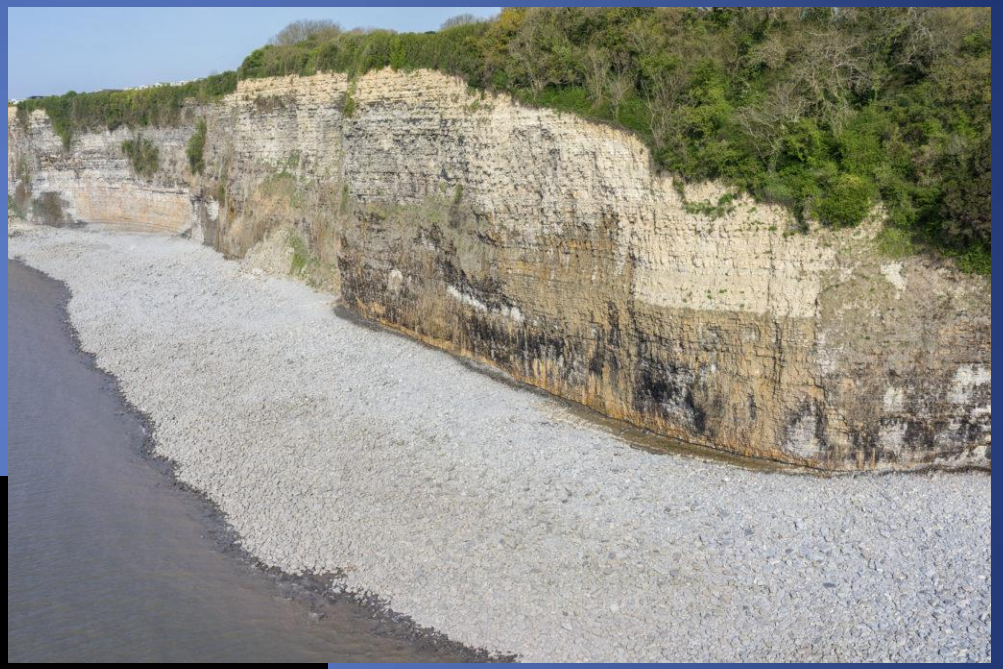
UAV Spring 2017 survey coverage

UAV / Drone Surveys

Future Aerial - Un-manned Aerial Vehicle

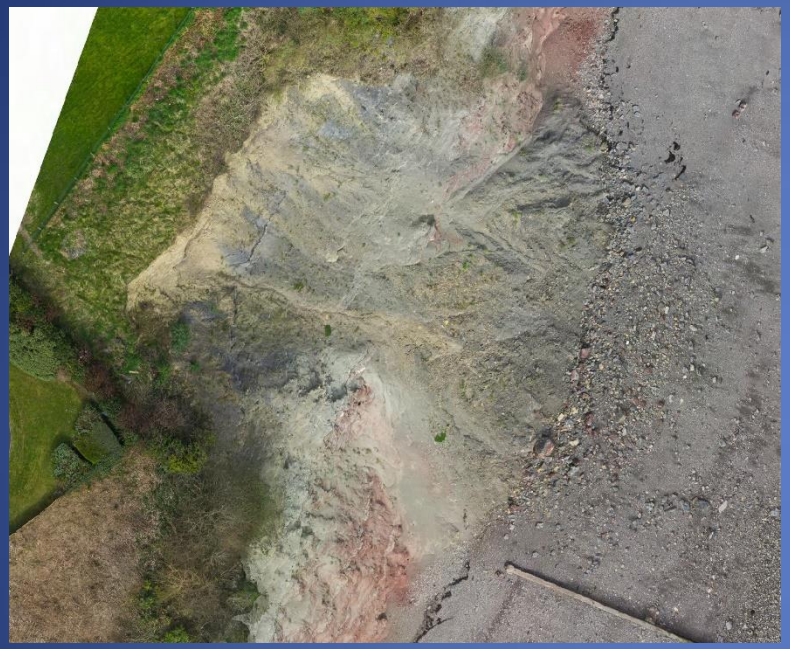
UAV / Drone Surveys

High resolution aerial imagery



Point cloud extracted from imagery

UAV / Drone Surveys



Penarth Head - cliff monitoring (2017)

LiDAR Surveys

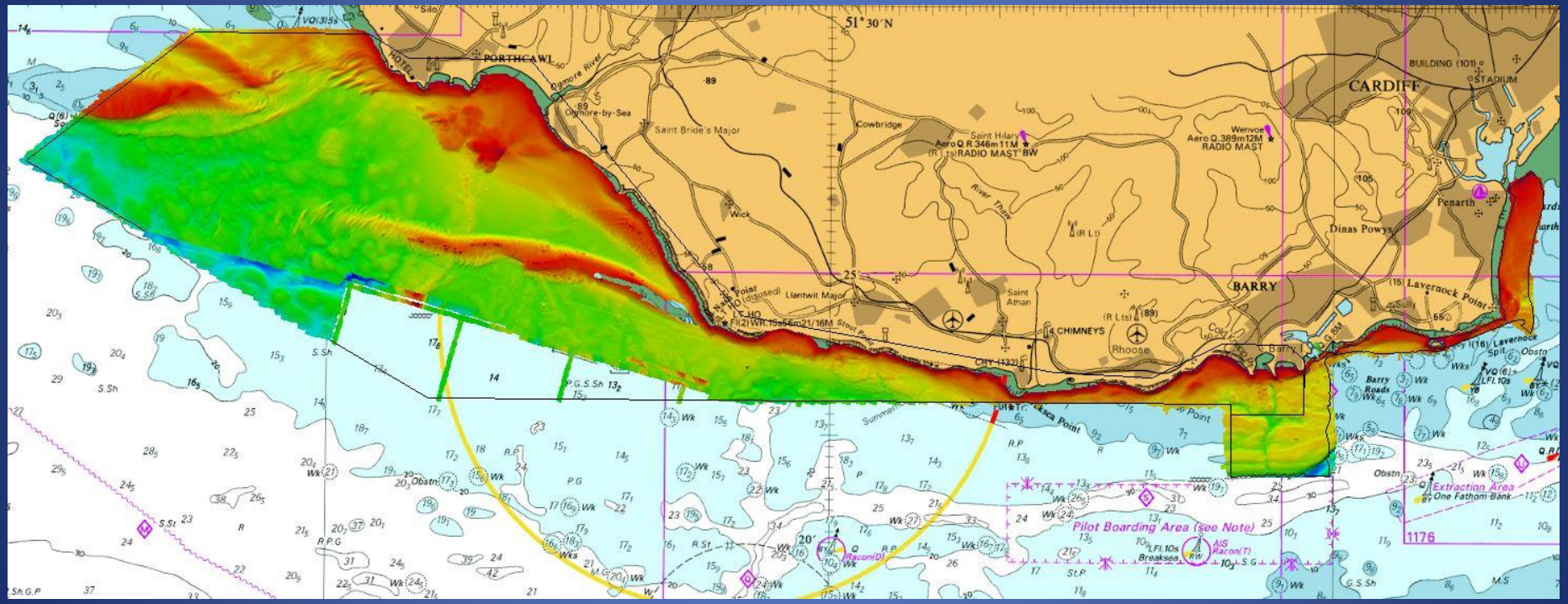
- LIDAR, which stands for Light Detection and Ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth.

2016/17 Natural Resources Wales – Coastal LiDAR sortie

Bathymetric Surveys

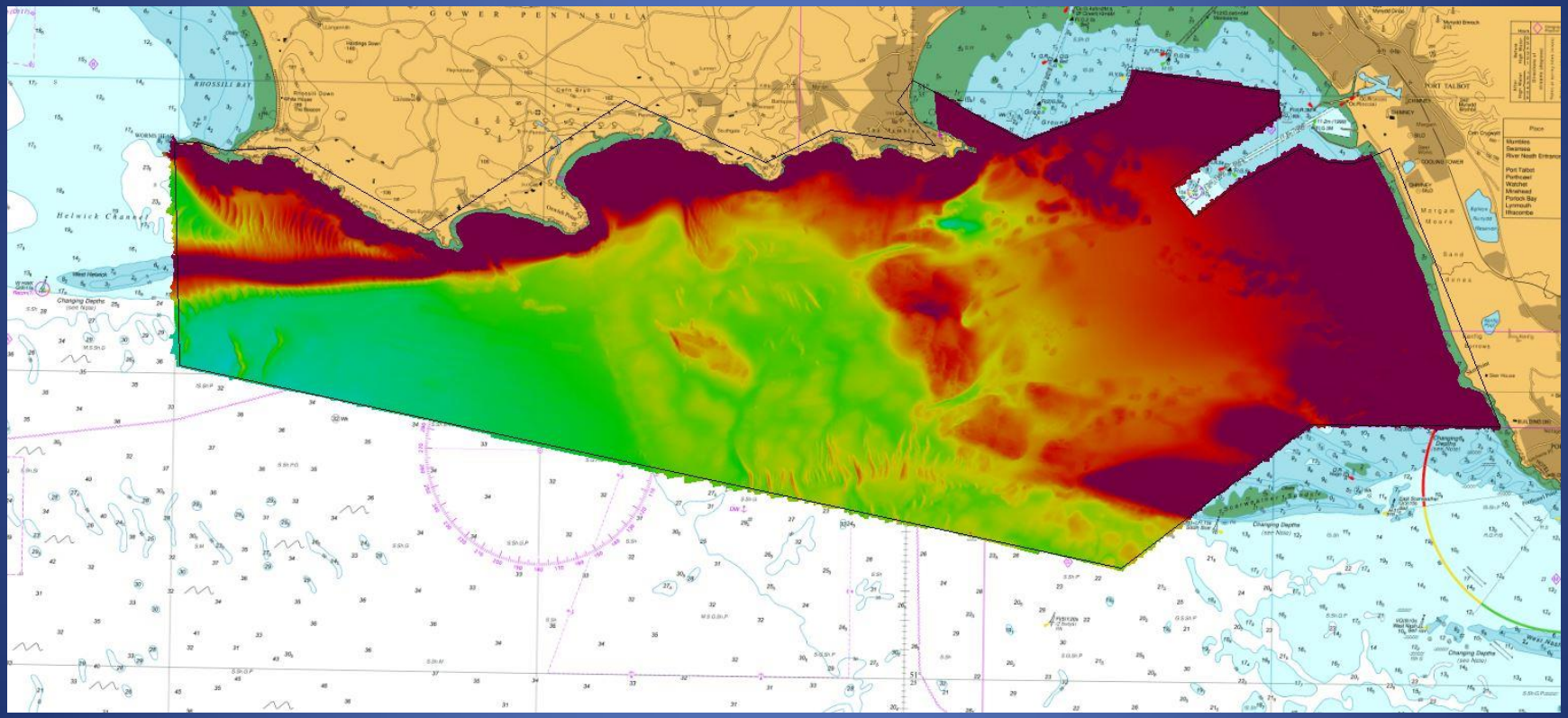
2017/18 Civil Hydrography Programme – Survey Vessels

Bathymetric Surveys



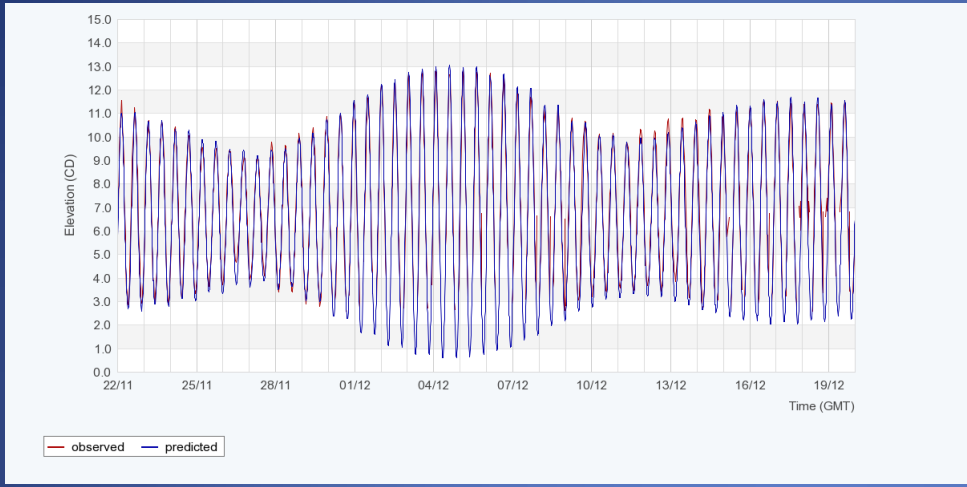
2017/18 Civil Hydrography Programme Coverage

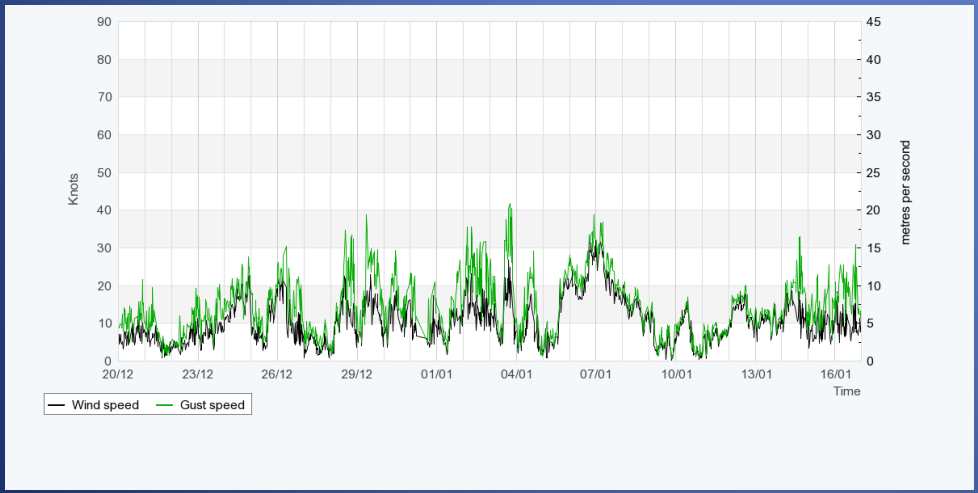
Bathymetric Surveys

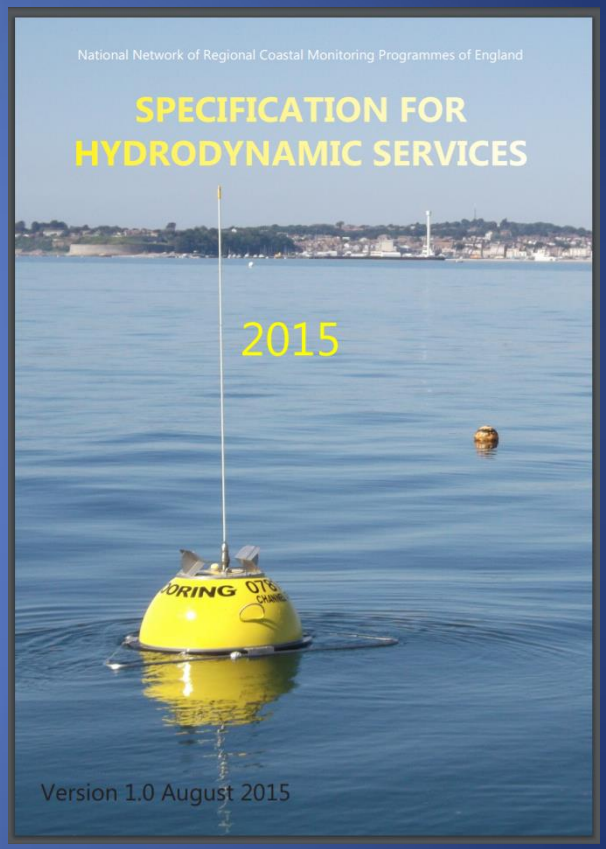


2017/18 Civil Hydrography Programme Coverage

Hydrometric Data

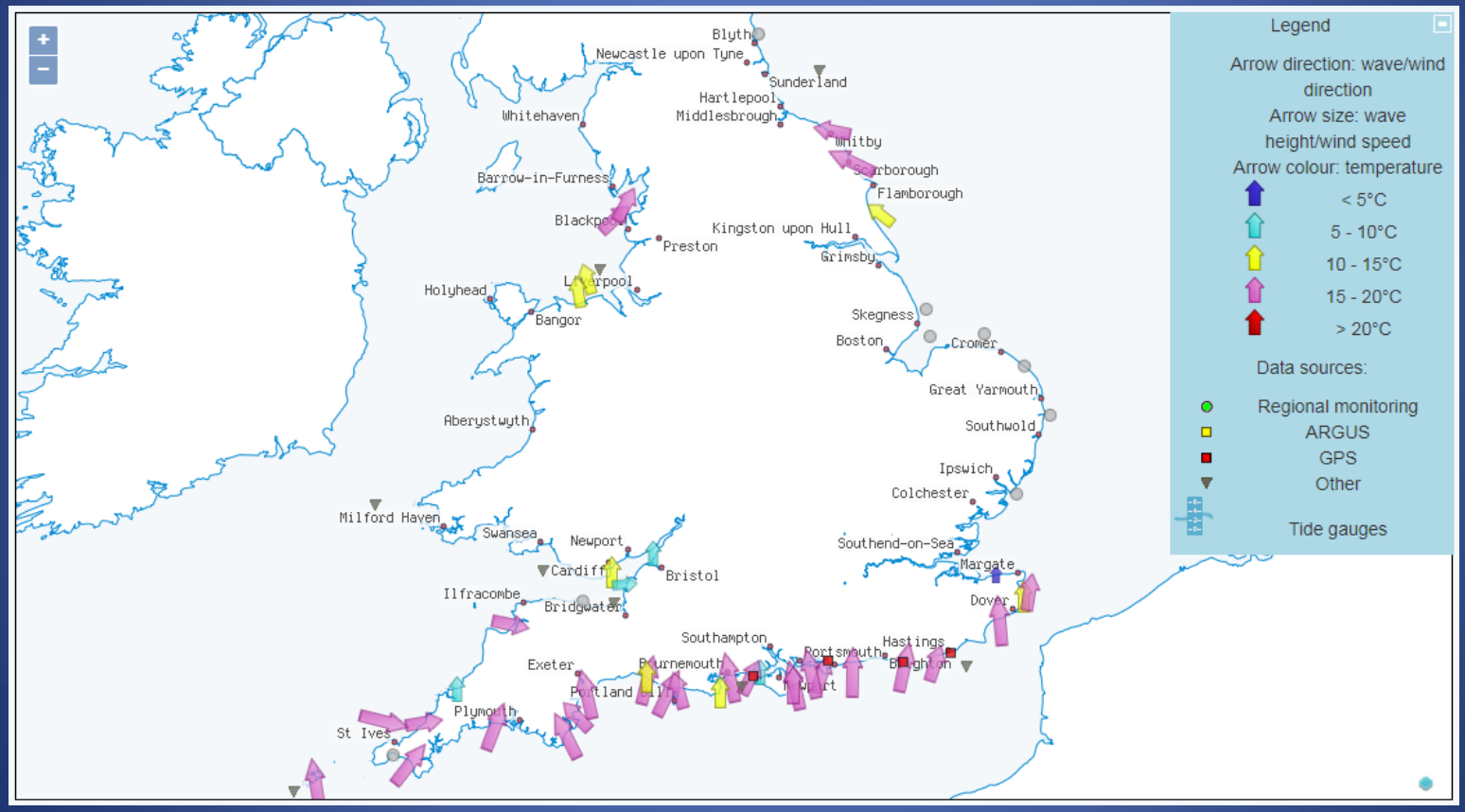






Penarth Pier Wave and Tide gauge data – www.channelcoast.org

Hydrometric Data

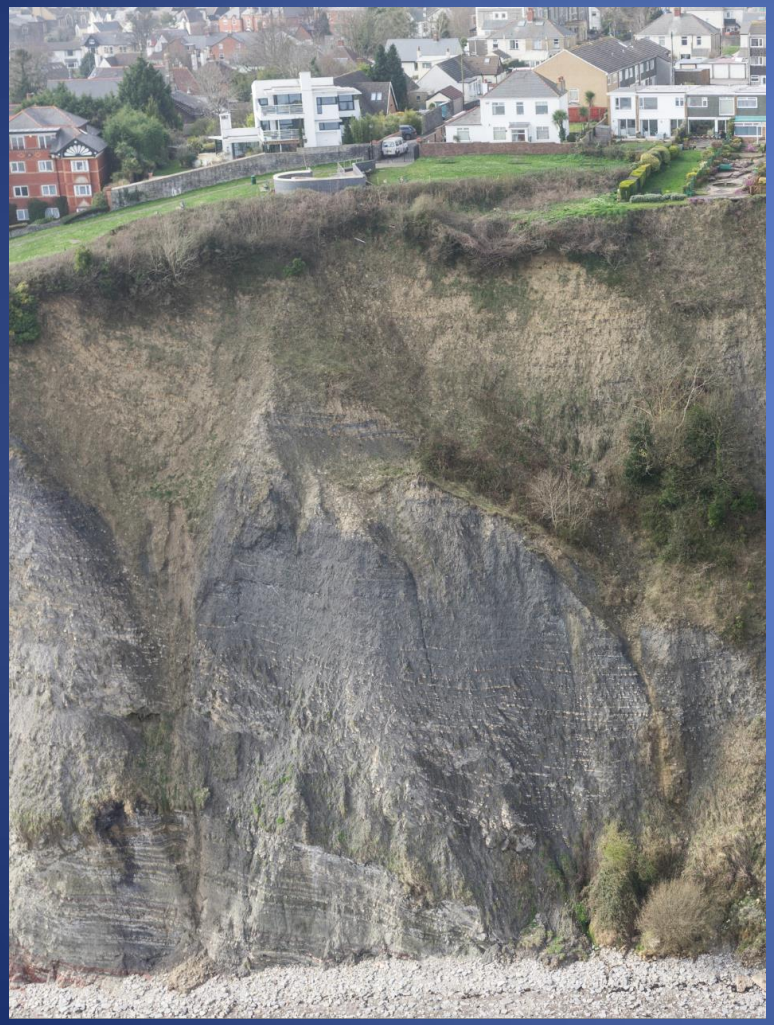


Penarth Pier Wave and Tide gauge – www.channelcoast.org

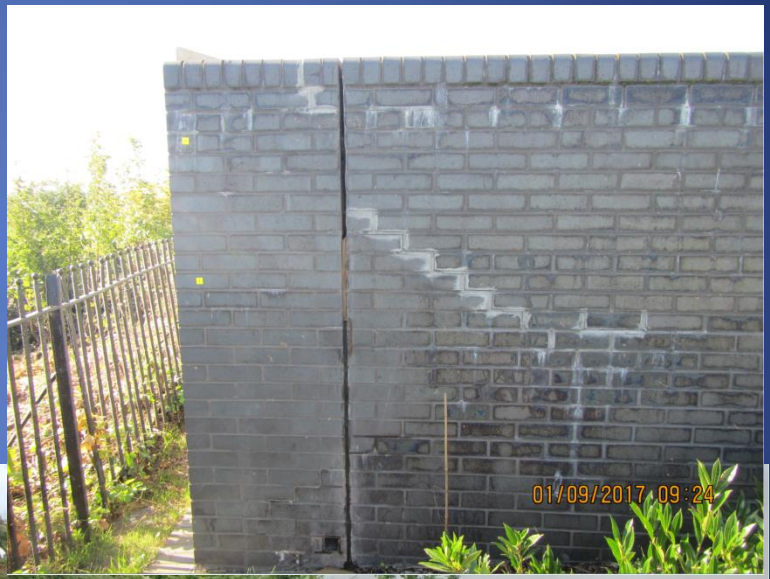
Hydrometric Data

Penarth Pier Wave and Tide gauge installation

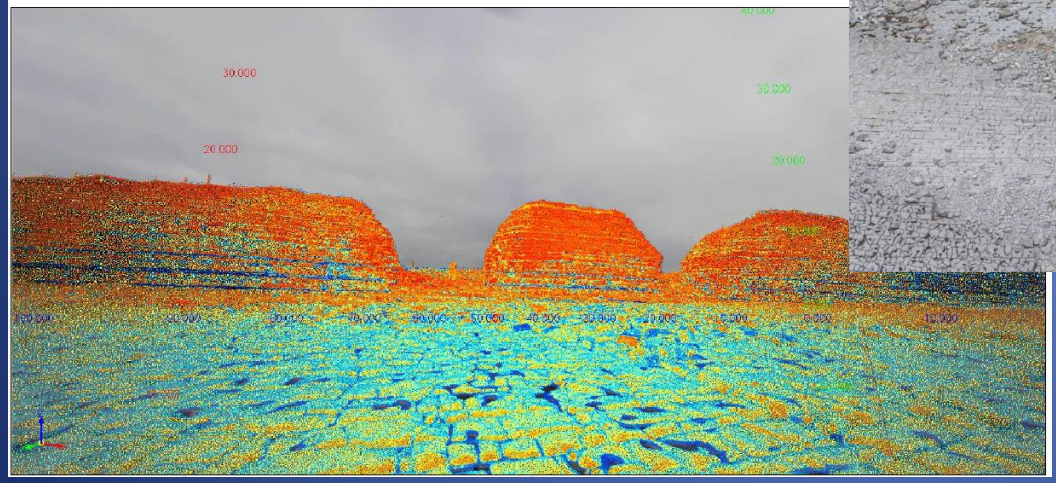
Penarth Observation Platform



UAV Imagery and rope access inspection



Rhoose Point - Cliff Monitoring



Terrestrial Laser Scan & UAV survey – Spring 2017

Future Aims

- Reactive localised monitoring in response to specific issues
- Improved monitoring of coastal structures
- Develop baseline survey of entire coastline
- Active participation in Welsh Coastal Monitoring Centre
- Continued participation in Coastal Groups

Any Questions?