Coastal Monitoring Update

Clive Moon

Engineering Manager - Environment

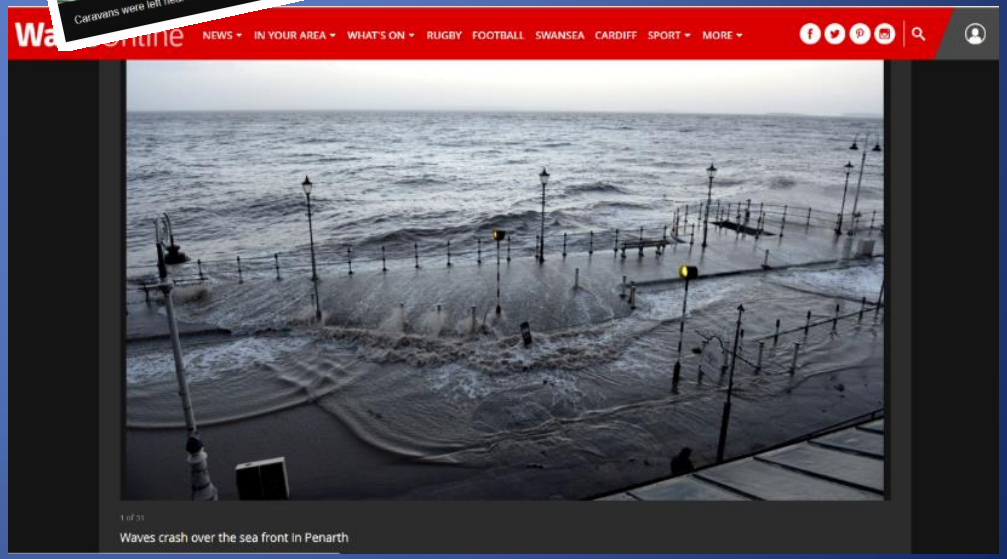
Coastal Monitoring

- Background to monitoring
- Climate change
- Wales Coastal Monitoring Centre
- Recent Monitoring
- Next steps

Why?

- 45 km of coastline
- 4 km coastal defences
- Approx 100 properties at tidal flood or coastal erosion risk
- > £15.8M land and property
- Critical infrastructure including Aberthaw power station and Barry sewage pumping station
- Tourism and recreation

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



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

Why?

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Climate change

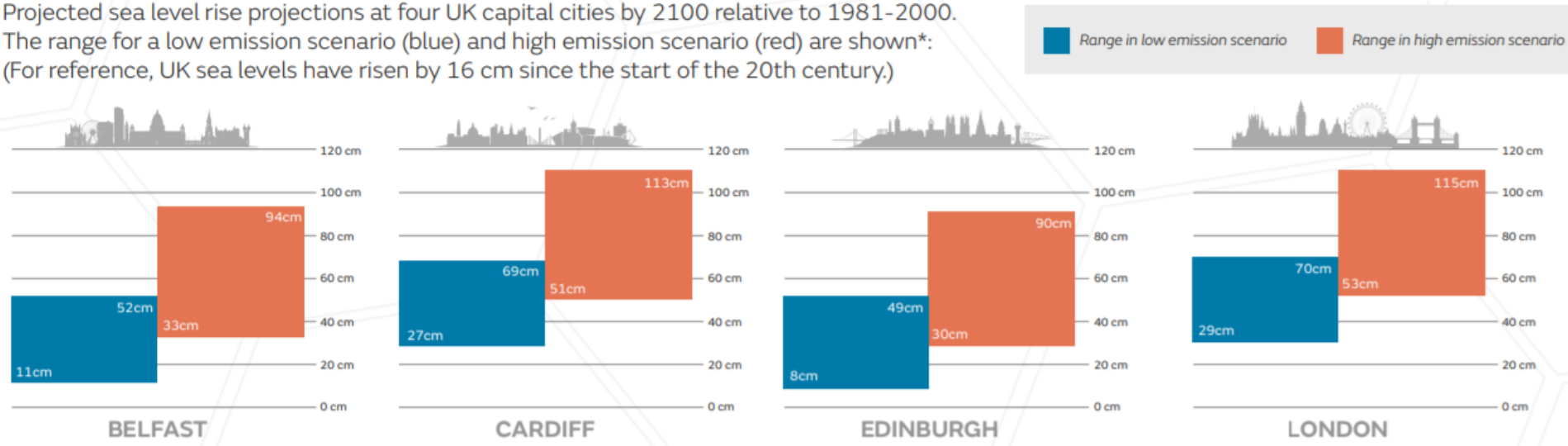
- UK coastal flood risk is expected to increase over the 21st century and beyond under all climate change scenarios
- Increase in frequency and magnitude of extreme water levels
- Increased future flood risk will be dominated by the effects of time-mean sea level rise

Department for Environment Food & Rural Affairs | Department for Business, Energy & Industrial Strategy | Environment Agency | Met Office

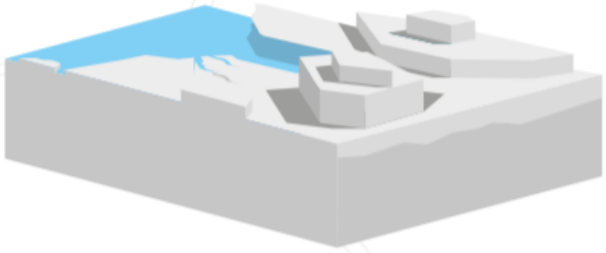
UKCP18 MARINE CLIMATE CHANGE

How much will sea levels rise in the UK?

Projected sea level rise projections at four UK capital cities by 2100 relative to 1981-2000. The range for a low emission scenario (blue) and high emission scenario (red) are shown*: (For reference, UK sea levels have risen by 16 cm since the start of the 20th century.)

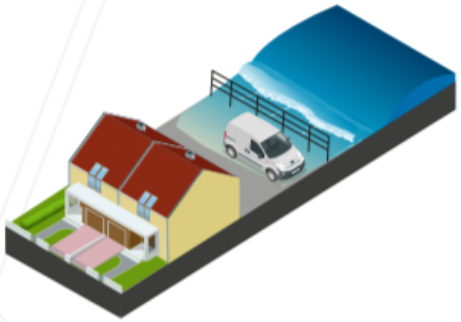


*RCP2.6 and RCP8.5 are the low and high emission scenarios used, as in IPCC AR5. The range is very likely (5th-95th percentile).



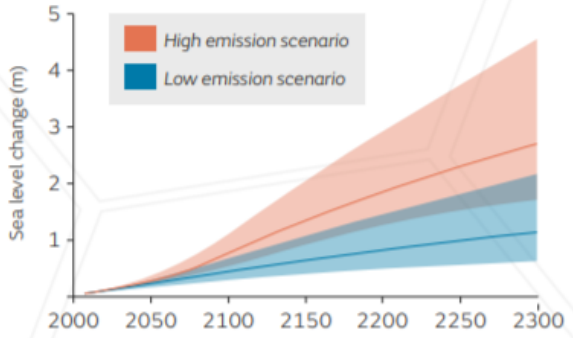
Ice sheets

Sea levels could rise further if there is additional large-scale melting of ice sheets. Future melting of Antarctic ice sheets is particularly uncertain.



Sea level extremes

Risk of coastal flooding from storm surges and high tides will increase as sea levels rise.



Sea levels beyond 2100

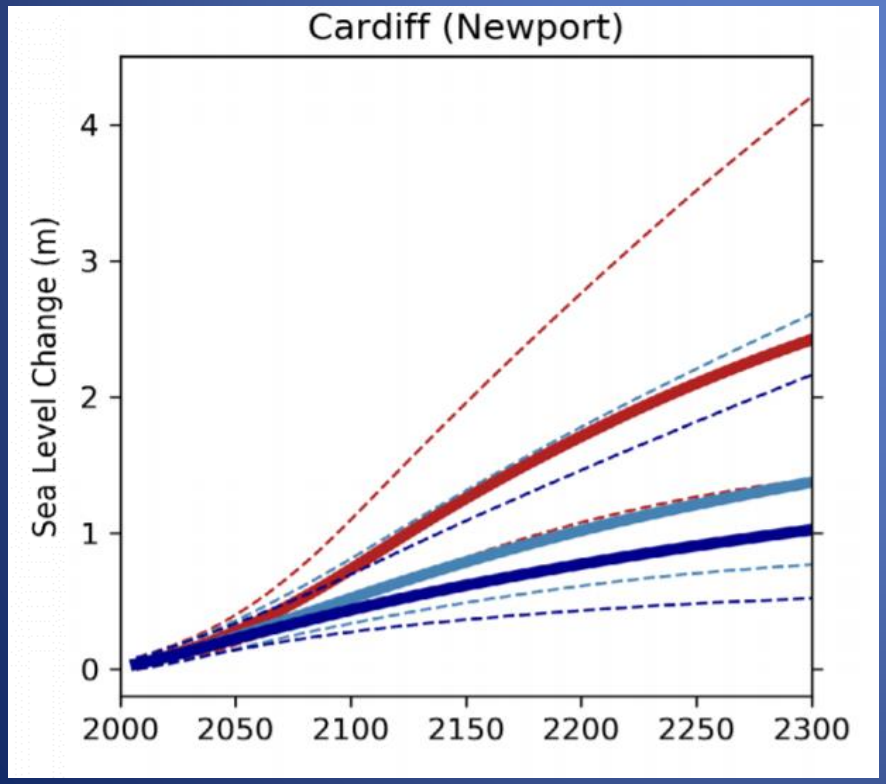
Sea levels will continue to rise beyond 2100, however the uncertainty also increases further into the future.

https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-infographic-headline-findings-marine.pdf. Accessed: 19/11/2019

Climate change

"Of the UK capital cities, London and Cardiff show the largest values of future sea level rise, with projected ranges at 2300 of approximately 0.5 - 2.2m, 0.8 - 2.6m and 1.4 - 4.3m for RCP2.6, RCP4.5 and RCP8.5, respectively"

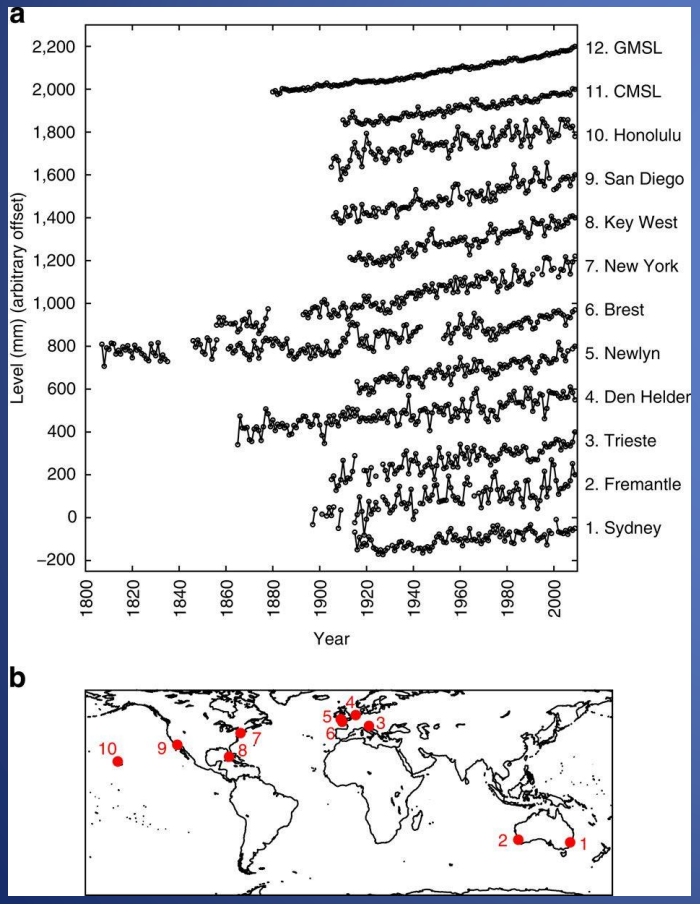
UKCP18 Marine Report, Nov 2018

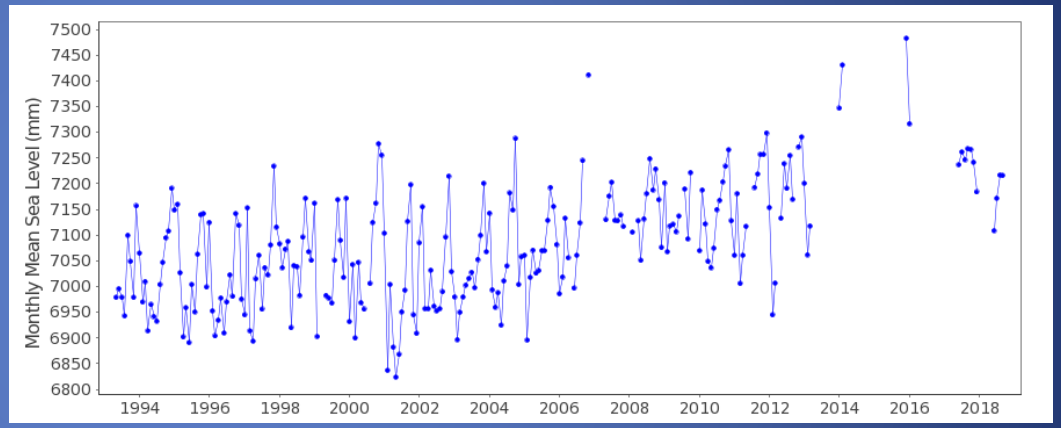


Time series of the time-mean sea level change for UK capital cities, based on the nearest class A tide gauge location (indicated in brackets). The solid lines indicate the central estimate and dashed lines indicate the range for each RCP as indicated in the legend. All projections are presented relative to a baseline period of 1981-2000. From: Palmer et al. (2018) UKCP18 Marine report, November 2018

Climate change

- Sea level rise is already occurring





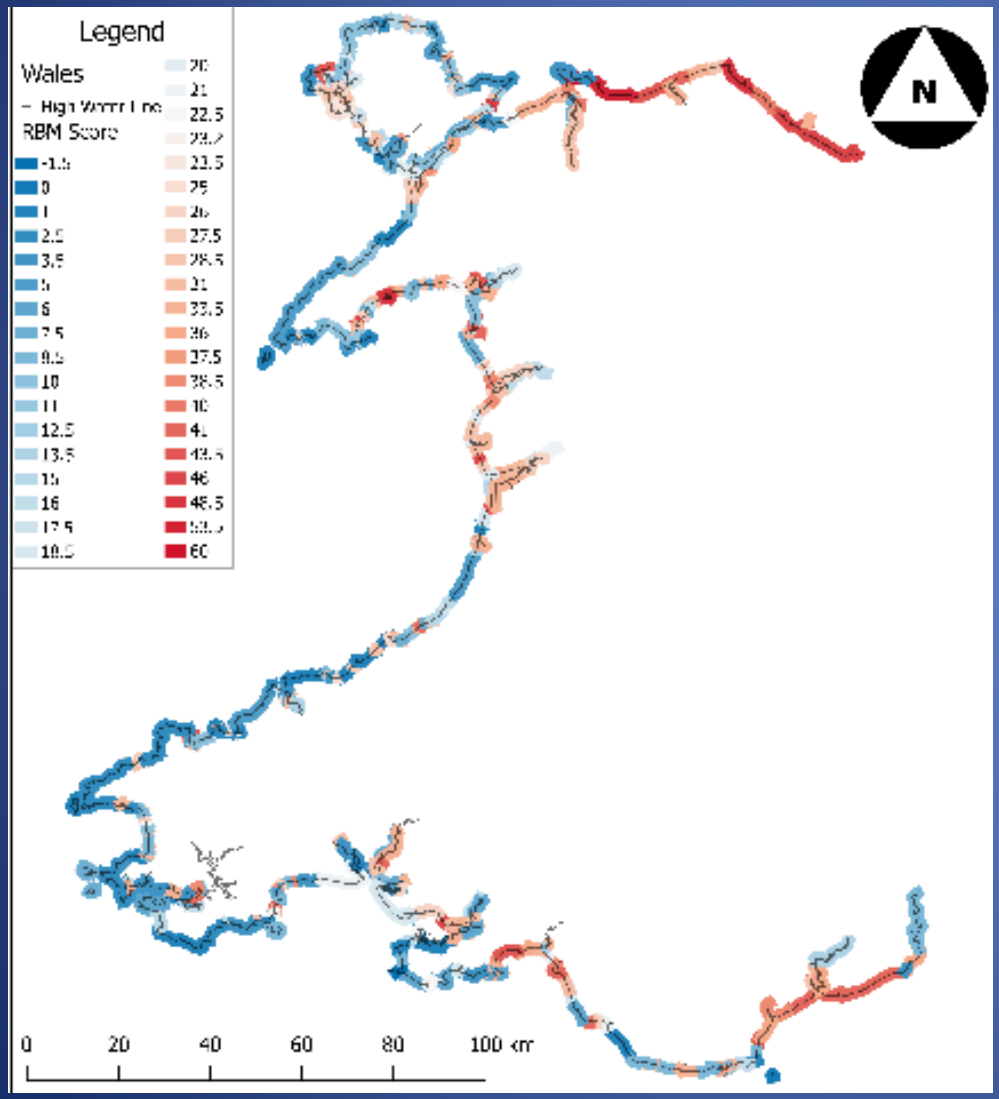
Mean sea level Newport, UK; From Permanent Service for Mean Sea Level, extracted 19th November 2019

(**a**) The 12 (10 tide gauge records, the CMSL and the GMSL) annual mean sea level records used in the present study, offset (by 200 mm) for clarity of presentation; (**b**) location of the 10 tide gauge sites. From, Haigh, I., Wahl, T., Rohling, E. et al. (2014)

What is the WCMC's role?

"To develop a strategic approach to coastal monitoring in Wales, supporting the National Strategy for Flood and Coastal Erosion Risk Management, through delivery of the evidence base required for risk based FCERM decision making"

How?



Colours by Policy Unit:

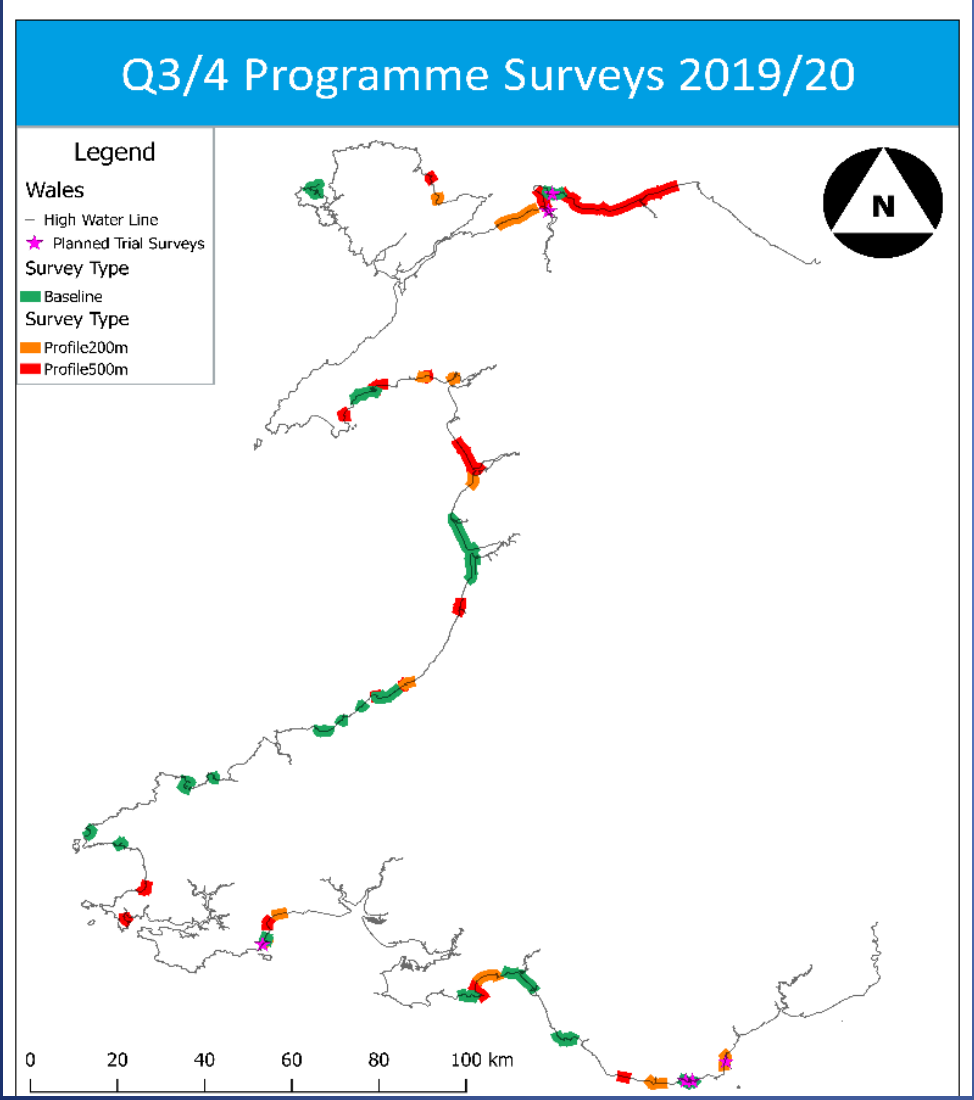
RED HIGH RISK

BLUE LOW RISK

www.wcmc.wales

www.cmac.cymru

Where?



CAMC : WCMC
Canolfan Monitro Arfordirol Cymru
Wales Coastal Monitoring Centre

www.wcmc.wales

www.cmac.cymru

VALE of GLAMORGAN
BRO MORGANNWG
CYNGOR GWYNEDD COUNCIL
WLGA · CLILC
CONWY
CYNGOR BWRDEISTREF SIROL
COUNTY BOROUGH COUNCIL

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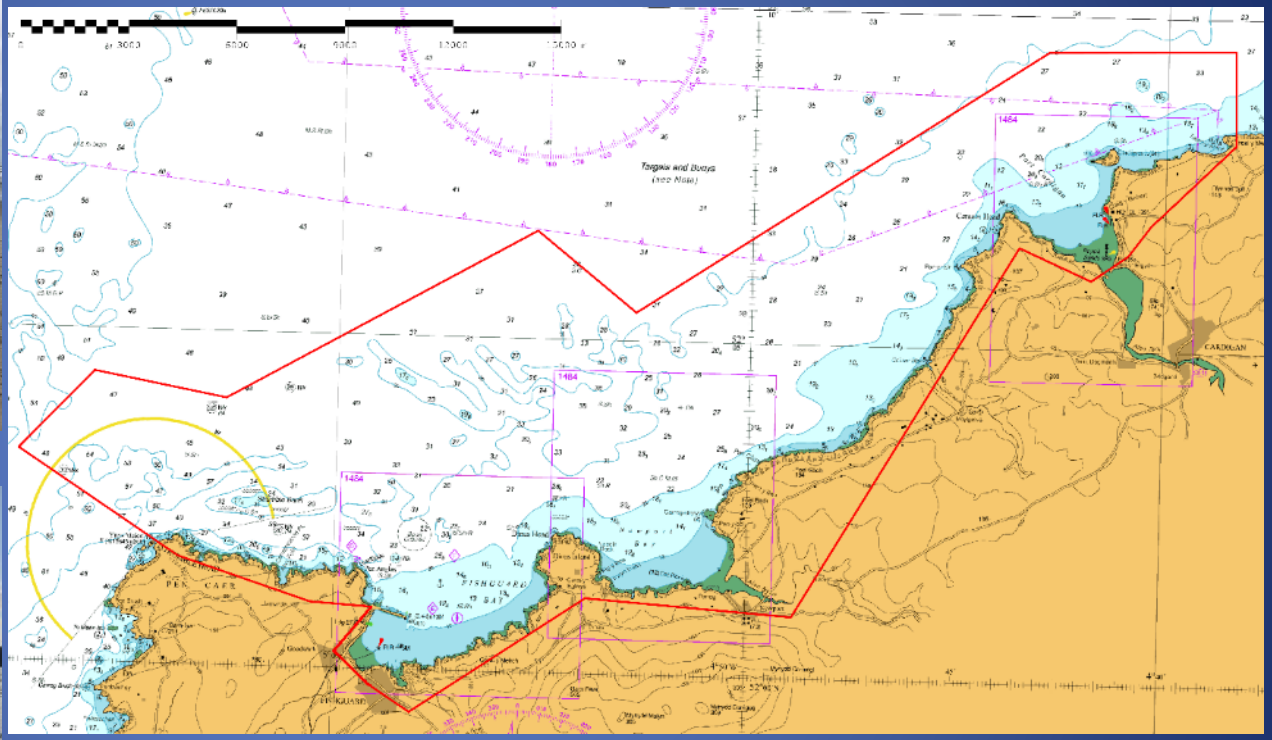
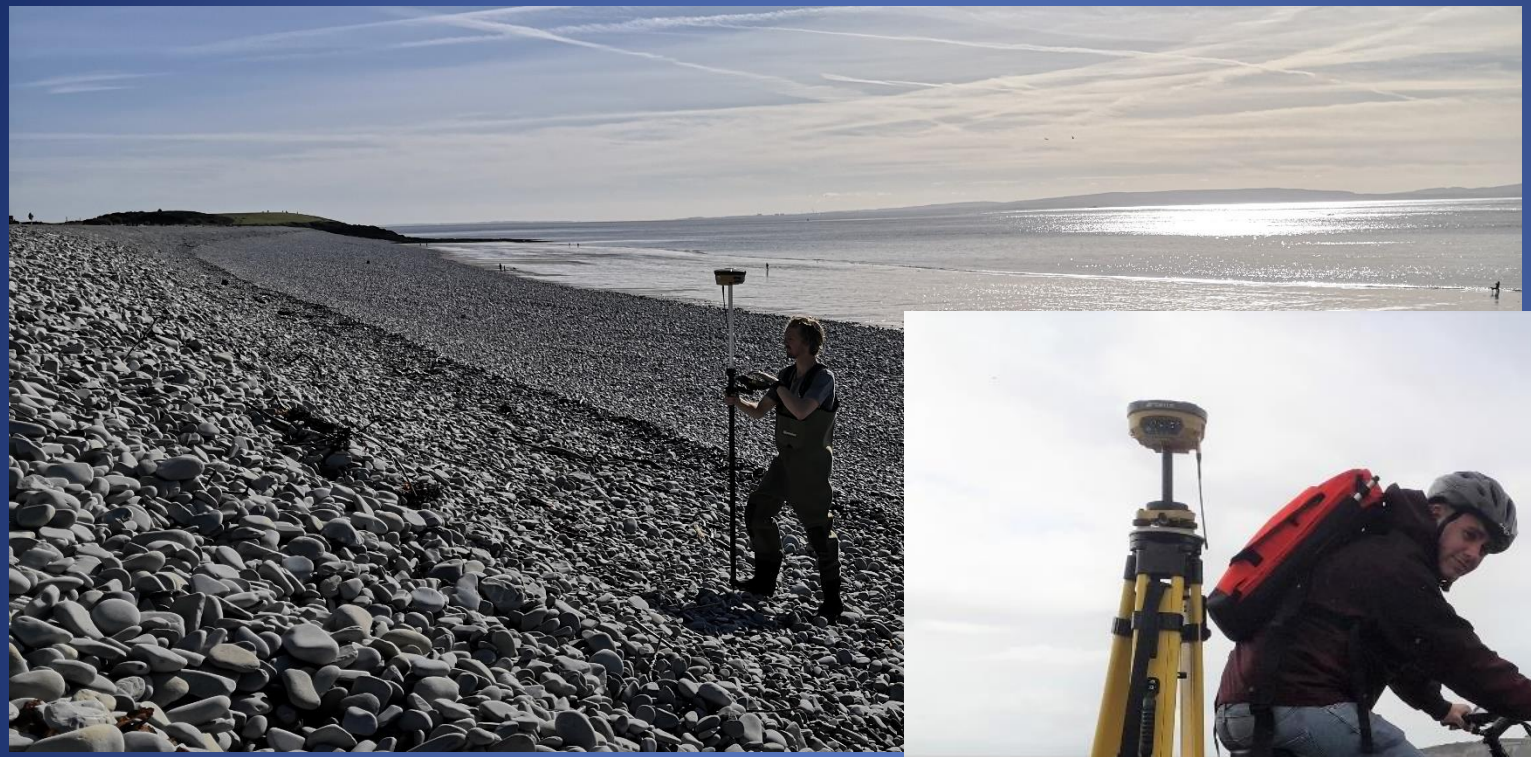


Collaboration with Civil Hydrography Programme

VALE of GLAMORGAN BRO MORGANNWG
CYNGOR GWYNEDD COUNCIL
WLGA · CLILC
CONWY CYNGOR BWRDEISTREF SIROL COUNTY BOROUGH COUNCIL

Recent monitoring



Baseline survey October 2019 – The Knap

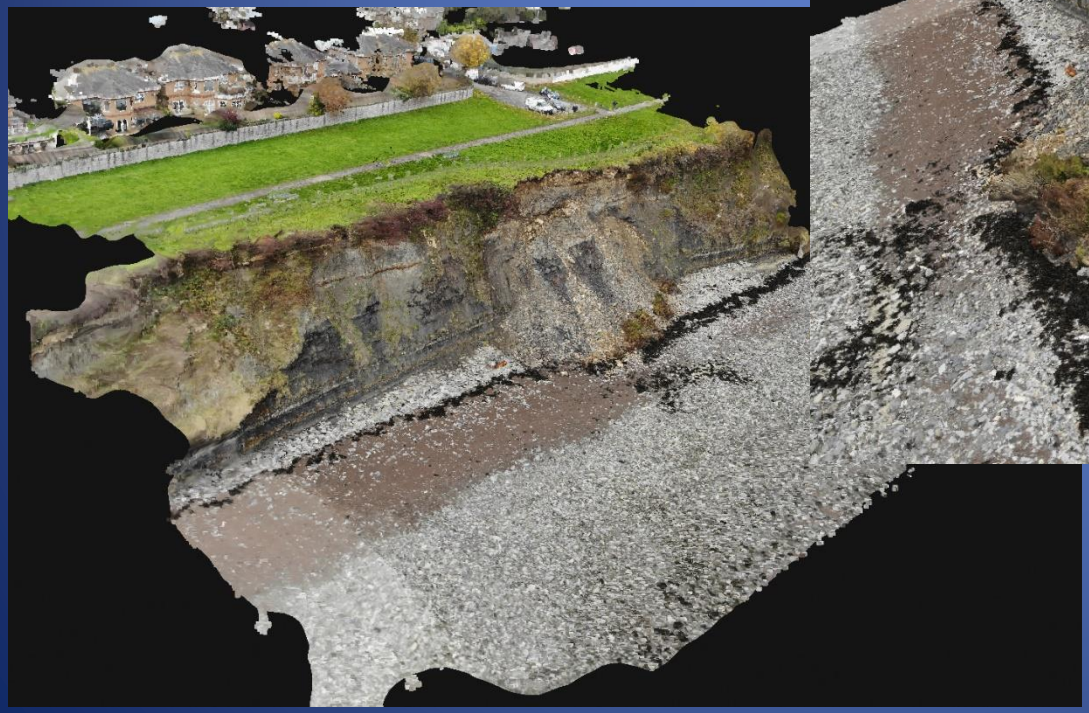
Recent monitoring

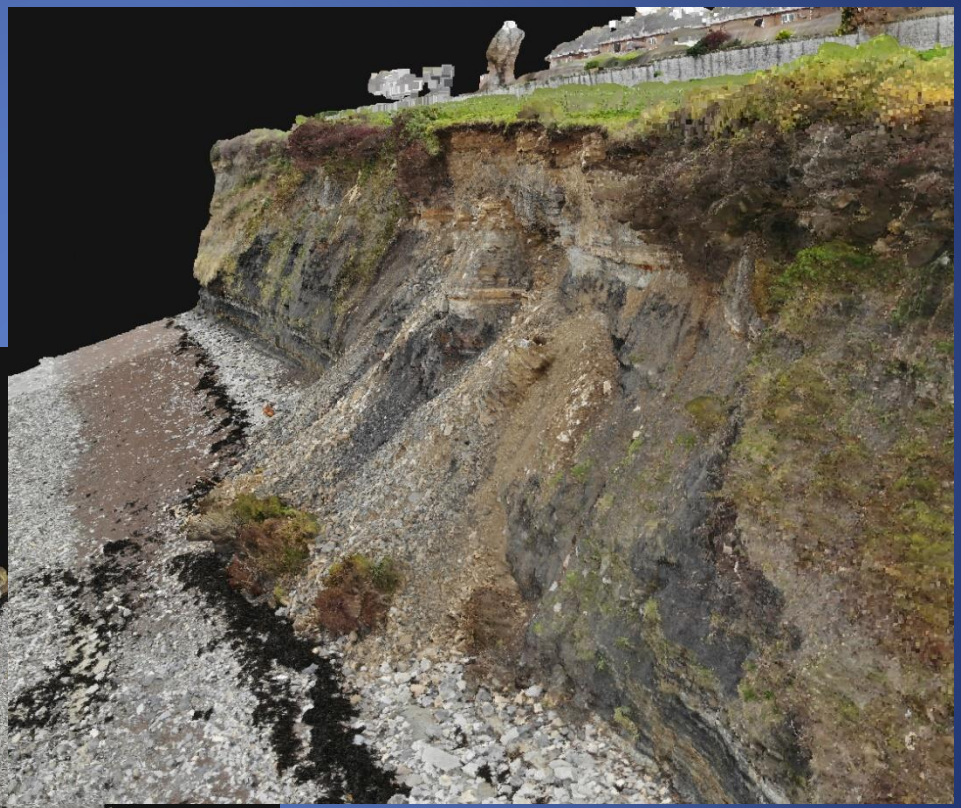
Baseline survey October 2019 – The Knap

Recent monitoring

Recent monitoring

Forest Road, Penarth;
13th November 2019





Point cloud extracted from imagery

Future Monitoring Aims

- Establish a consistent and routine monitoring regime around coastline
- Inform risk-based approach to managing coastal interests
- Continued support for the WCMC
- Collaboration with academia

Diolch

Thank you