

Southeast Regional Coastal Monitoring Programme



New Forest
DISTRICT COUNCIL

Dr Thomas Dhoop
Programme Manager
Channel Coastal Observatory

Aims

- Provide the evidence base needed for flood and coastal erosion risk management (FCERM)
- Support the Risk Management Authorities (RMA), including the Environment Agency (EA):
 - Plan, design and deliver coastal strategy
 - Coastal capital investment programme
 - Strategic coastal management such as shoreline management planning (SMP)
 - Incident management
- Increased understanding of the effect of climate change, local and national planning, research and education.

Aims

- In practice, we collect, in a standardised, repeatable and cost-effective way, the following datasets:
 - Wave, tide and meteorological data
 - Topographic data
 - Lidar data
 - Aerial photography
 - Bathymetry
 - Asset register
 - Analysis products:
 - Habitat mapping
- + Make the data freely available

Programme Design

A BRIEF HISTORY OF STRATEGIC COASTAL MONITORING

The National Network of Regional Coastal Monitoring Programmes provides strategic monitoring to support FCERM. This is a brief history of the programme.

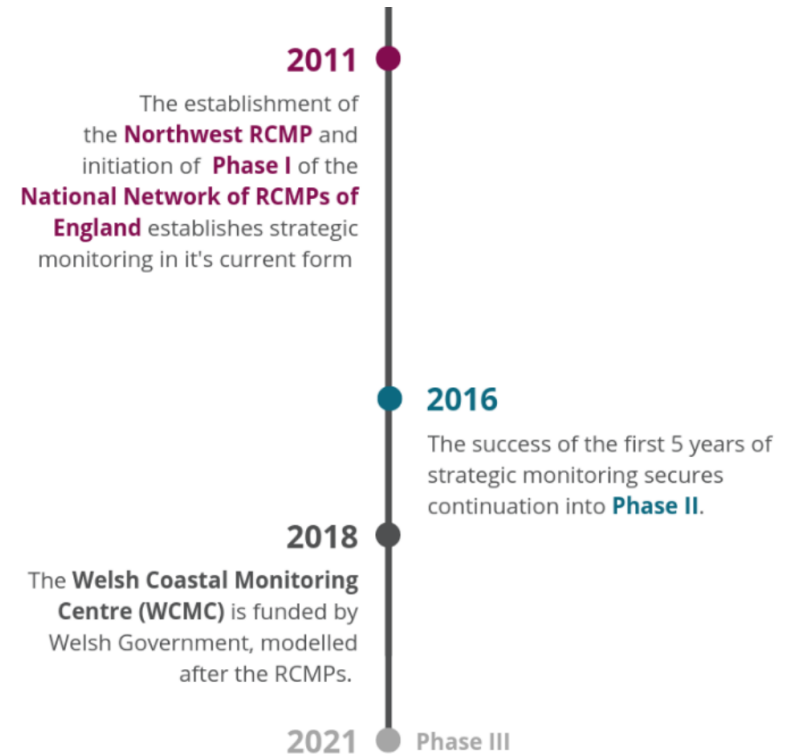
1950'S
East Riding of Yorkshire initiates cliff and beach monitoring, using photography and tape measures, in response to the management challenges of a rapidly eroding coastline. A period of local and regional ad-hoc coastal monitoring.

1987
The **Anglian "Sea Defence Management Study"**, is the first regional scale monitoring programme, and the forerunner to the development of **Shoreline Management Plans (SMPs)**.

2002
Andy Bradbury establishes the **Southeast Strategic Regional Coastal Monitoring Programme (RCMP)** to provide a standard, repeatable and cost-effective method of monitoring the coastal environment.

2006
Strategic monitoring is extended to the **Southwest RCMP**

2008
The **Northeast Coastal Observatory (NECO)** expands the regional monitoring ethos northwards



Phase III (2021- 2027):

Data records extend to 20 years in the Southeast and 10 years nation-wide

Programme Design

- Lead local authorities:



Programme Design



- CCO is the lead representative for the National Network of Regional Coastal Monitoring Programmes

Funding

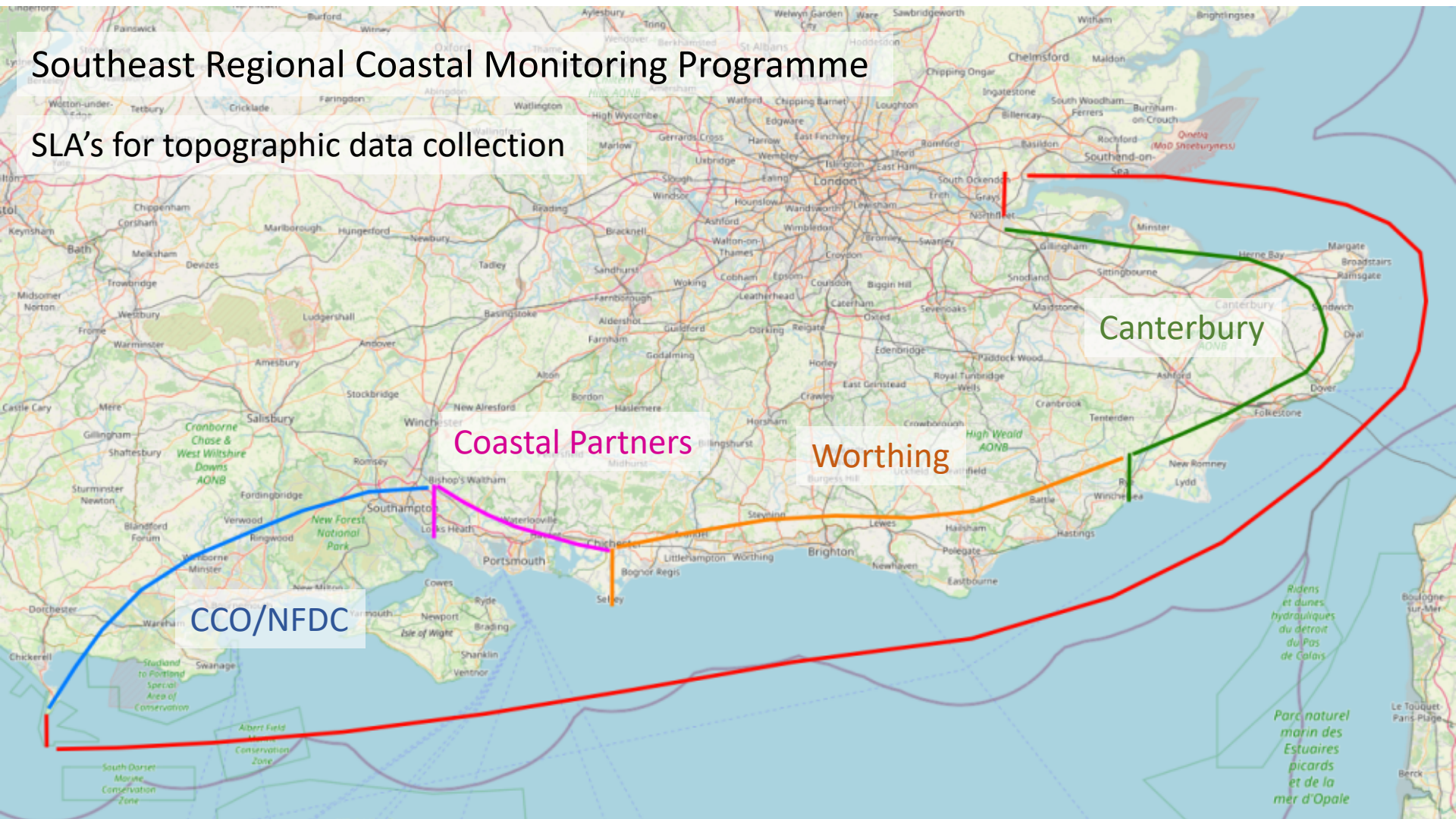
- Fully funded, Flood defence grant-in-aid (FDGiA) from DEFRA, via the Environment Agency
- Phase III: 2021-2027
- Project budget: £12,382,000



CCO, Lead Authority for the Southeast

Southeast Regional Coastal Monitoring Programme

SLA's for topographic data collection



Canterbury

Coastal Partners

Worthing

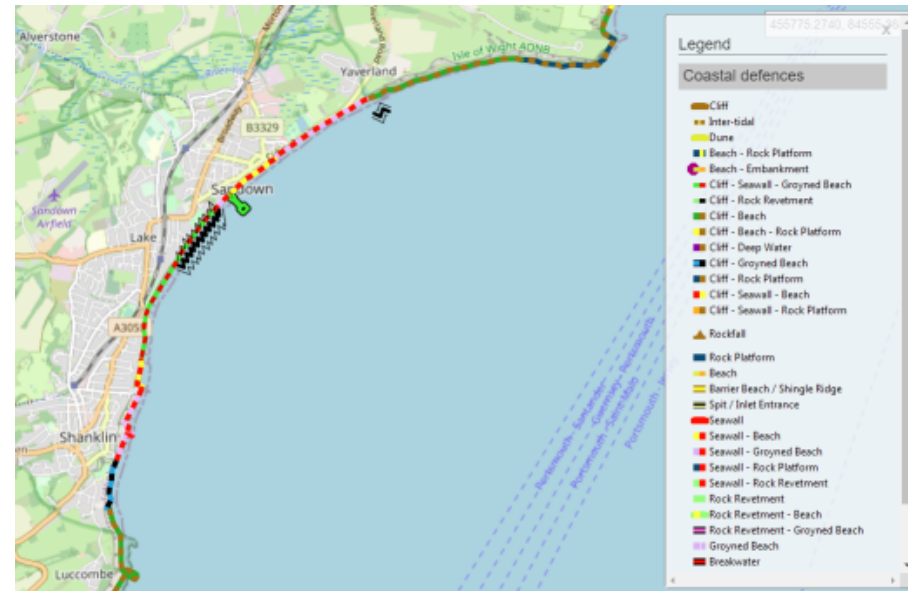
CCO/NFDC

Ridens et dunes hydrauliques du détroit du Pas de Calais

Parc naturel marin des Estuaires picards et de la mer d'Opale

Risk-Based Monitoring

- Targeted approach
 - Geomorphology
 - Exposure
 - SMP Management Policy
 - Hold the line
 - Do nothing
 - Advance the line
 - Managed re-alignment
 - Beach Management Plan
- Once-per-phase Survey Schedule Review



Data Collection

- Wave, tide and meteorological data

- Topographic data
- Lidar data
- Aerial photography
- Bathymetry

- Asset register

- Analysis product:
 - Habitat mapping

- Incident response

- NFDC Surveying



Hydrodynamic Network

National Network

- 72 Instruments:
 - 37 wave buoys
 - 14 tide gauges
 - 22 met stations

CCO provides a national service:

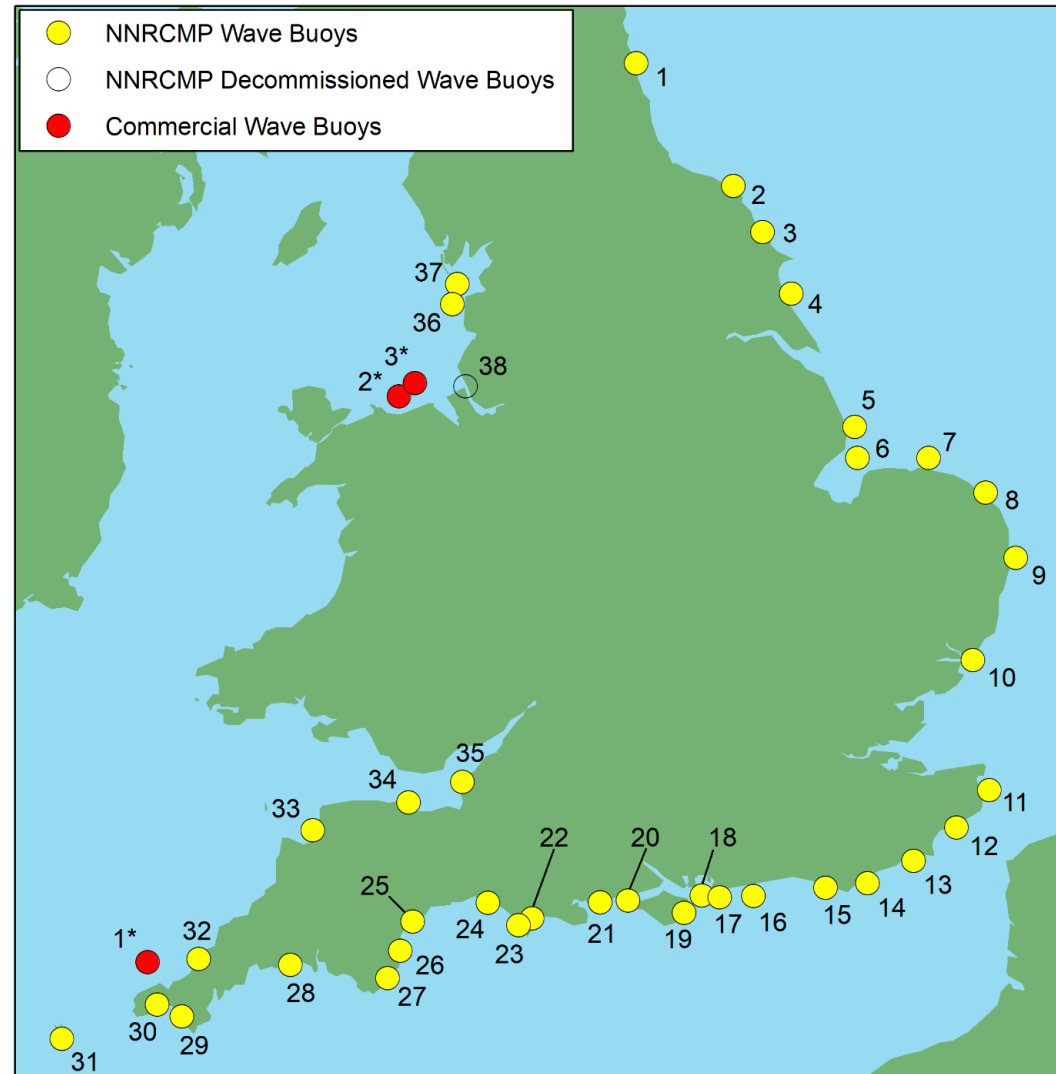
- Quality Control
- Analysis
- Technical advice



Wave Buoys

37 Datawell Directional
Waverider MkIII's

~10-15m CD

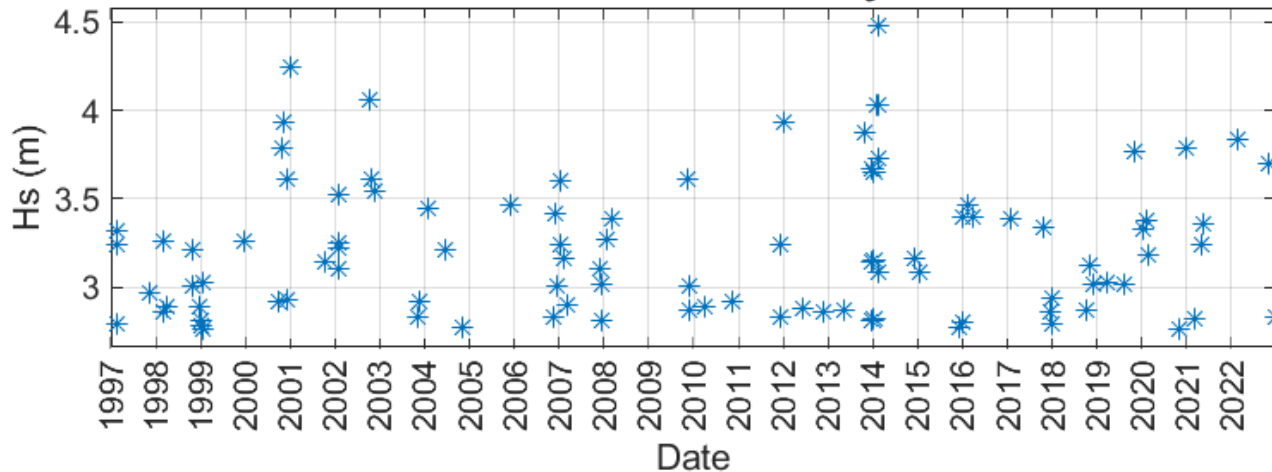


Milford Wave Buoy

Deployed on 20 May 1996,
~27 years of data



Storms at Milford - all years

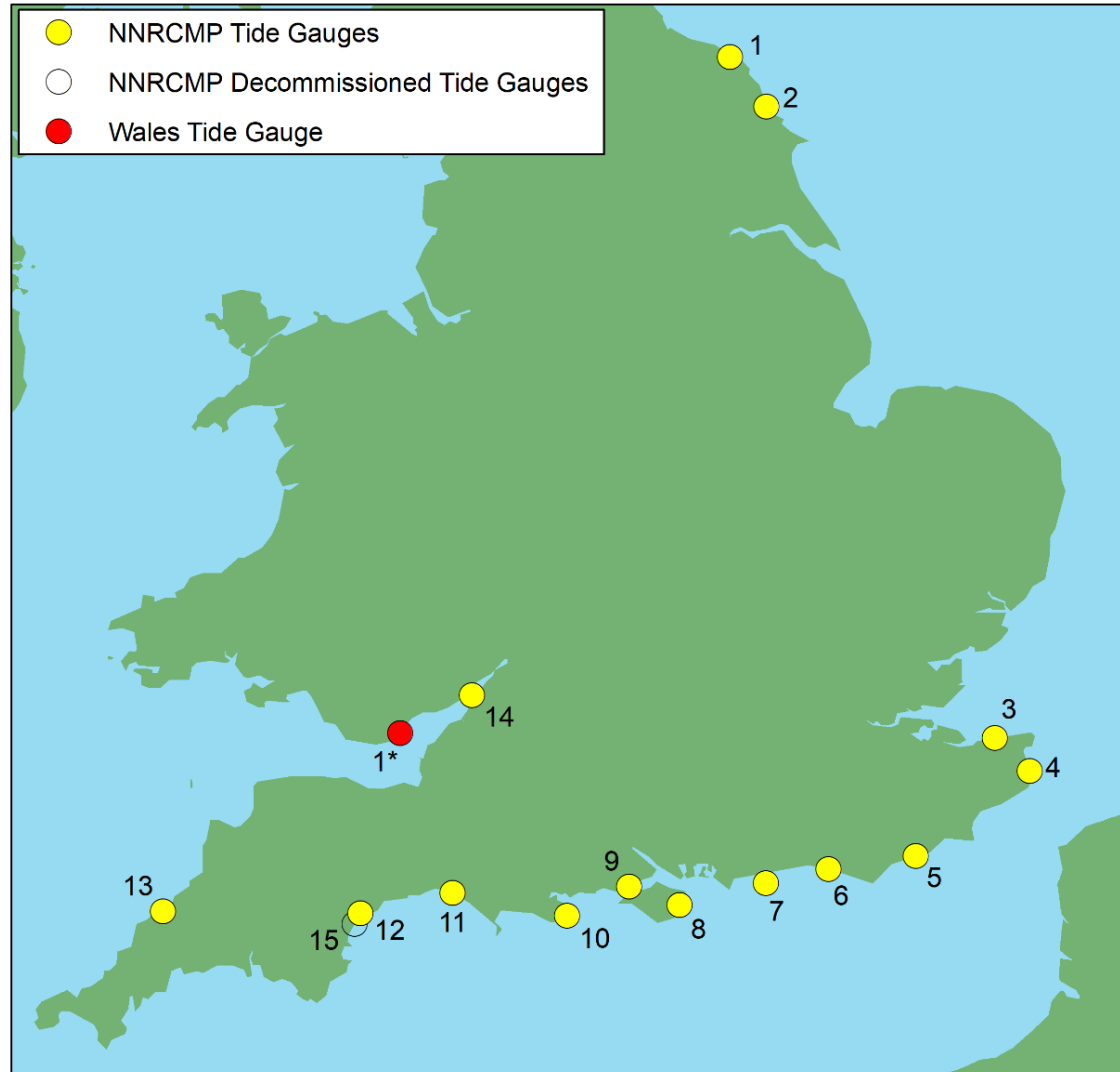


Tide Gauges

15 tide gauges



©Fugro GB Marine Ltd

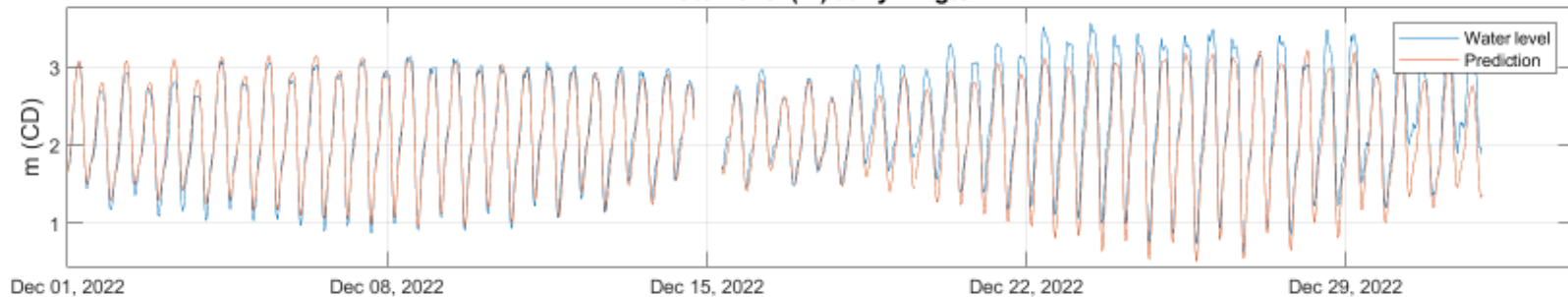


Lymington Tide Gauge

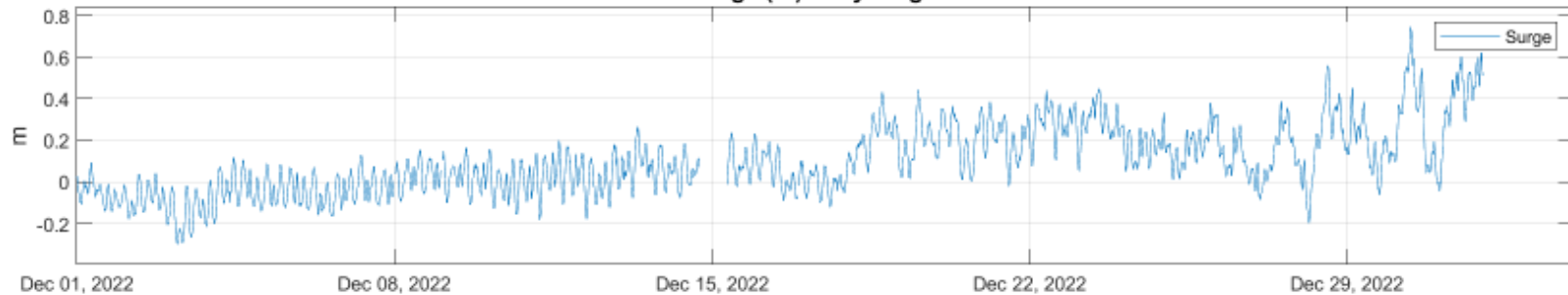
Deployed on 19 April 2007,
~16 years of data



Water level (m) at Lymington

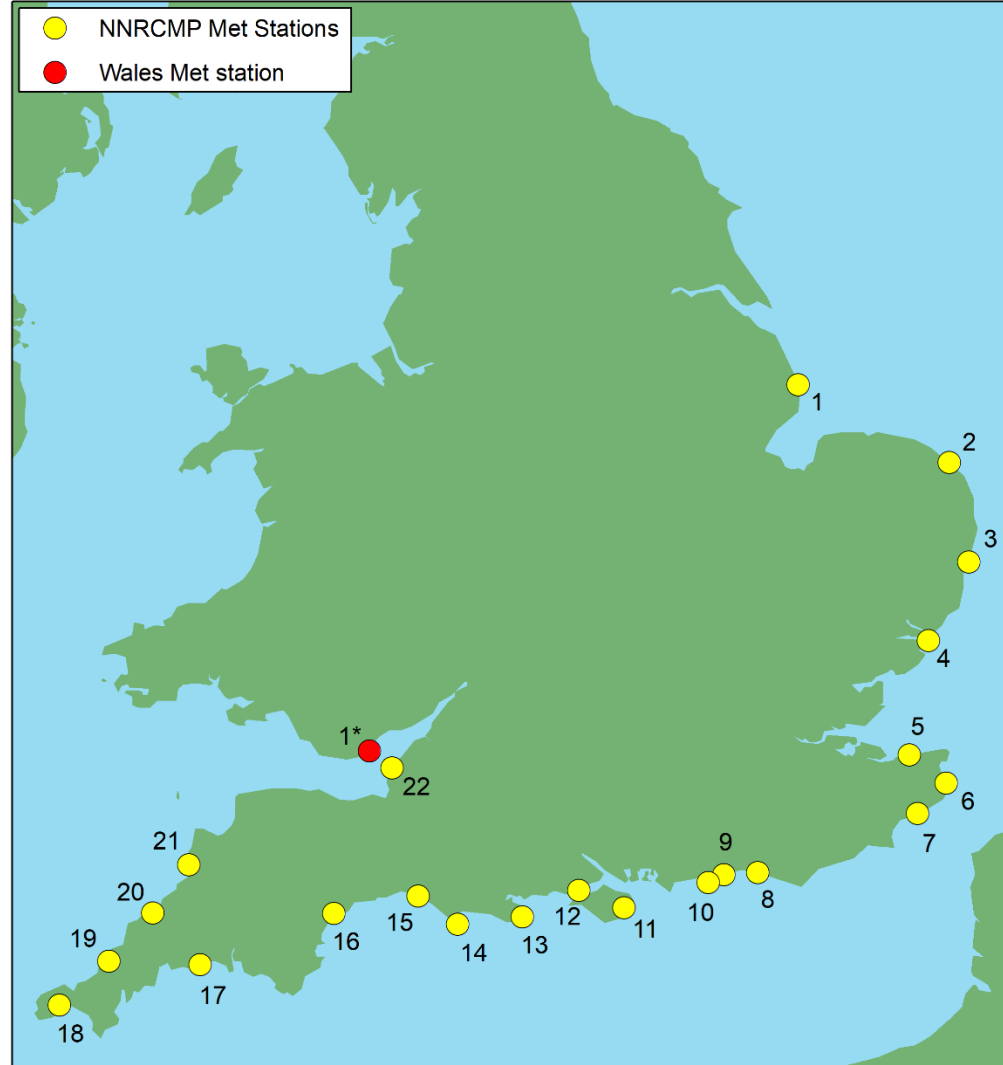


Surge (m) at Lymington

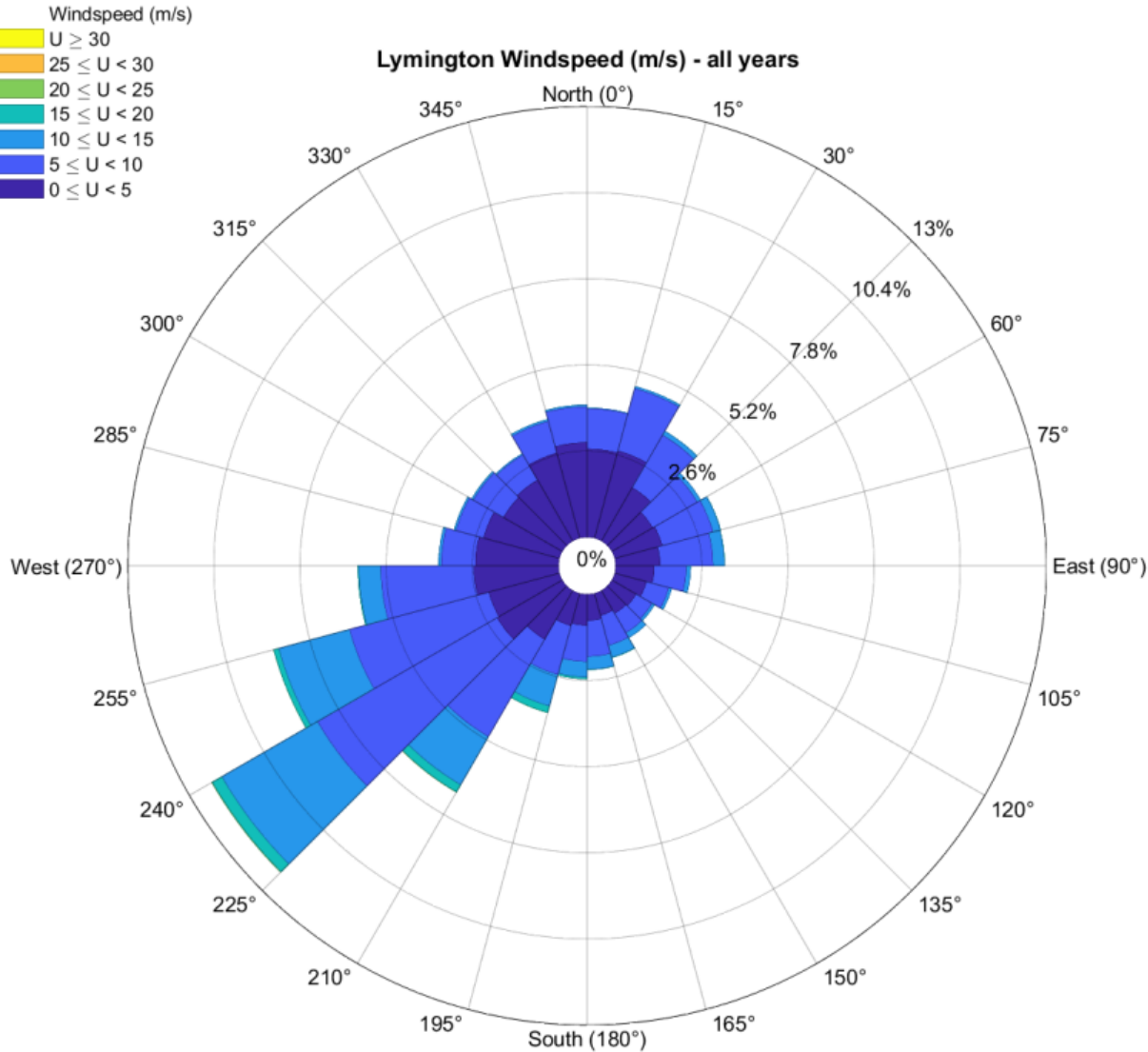


Meteorological Stations

22 meteorological stations



Lymington Met



Hydrodynamic Network

- Real-time data

- Visualised on website in graphs and tables
- Direct provision to:
 - CEFAS Wavenet
 - National Flood Forecasting Centre
 - Met Office (verification of WWIII model)
 - IOC Sea Level Monitoring Centre (VLIZ)
 - SWEEP OWWL overtopping model
 - ...

➔ Inform post-storm survey work

- QC'd data
- API

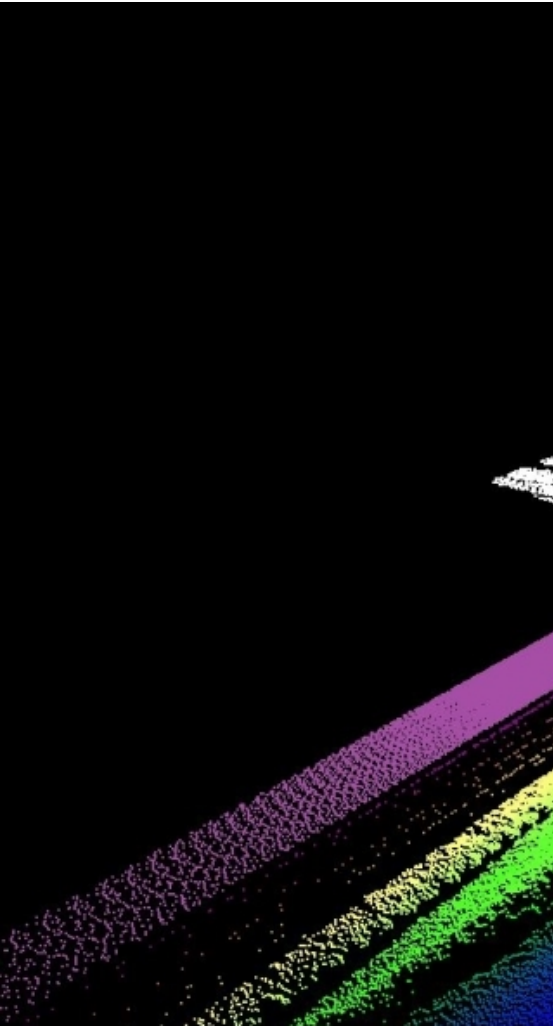
Met Office inshore
forecast verification



Topographic Data



Baseline surveys: Milford, 14 April 2021



Topographic Data

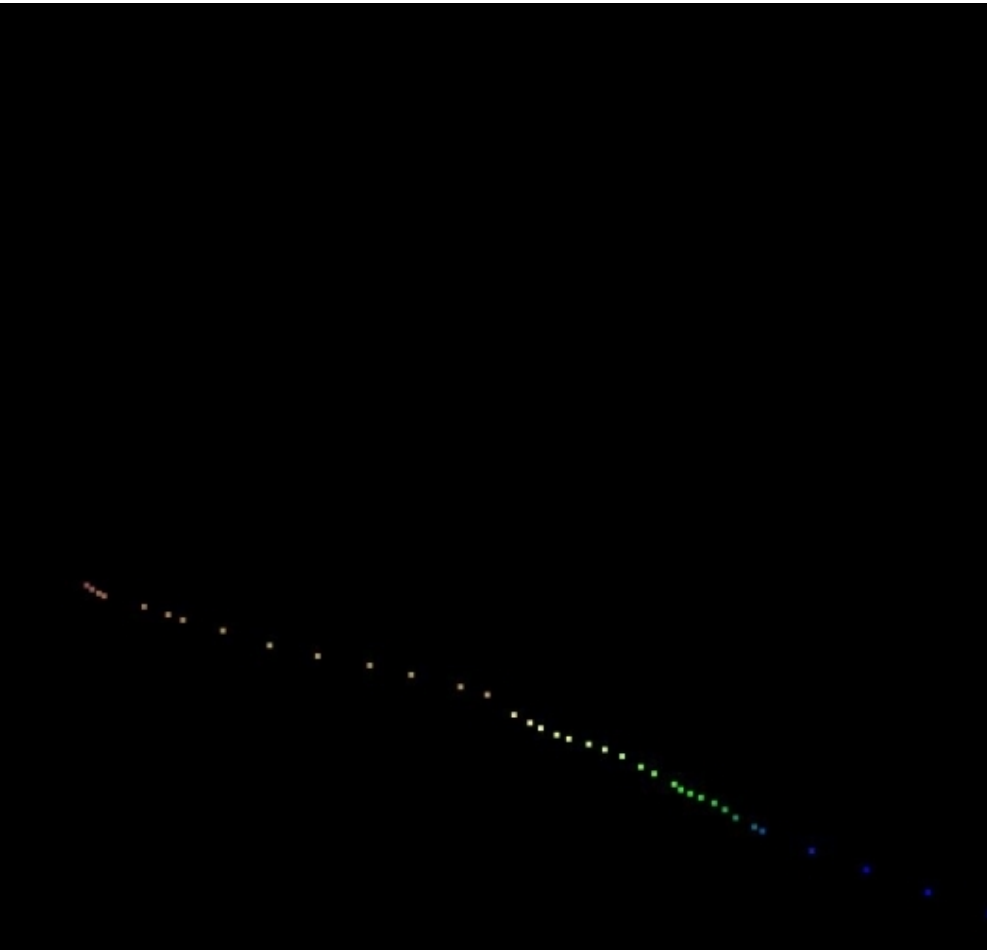
Baseline UAV surveys: Milford, 28 January 2022



Topographic Data



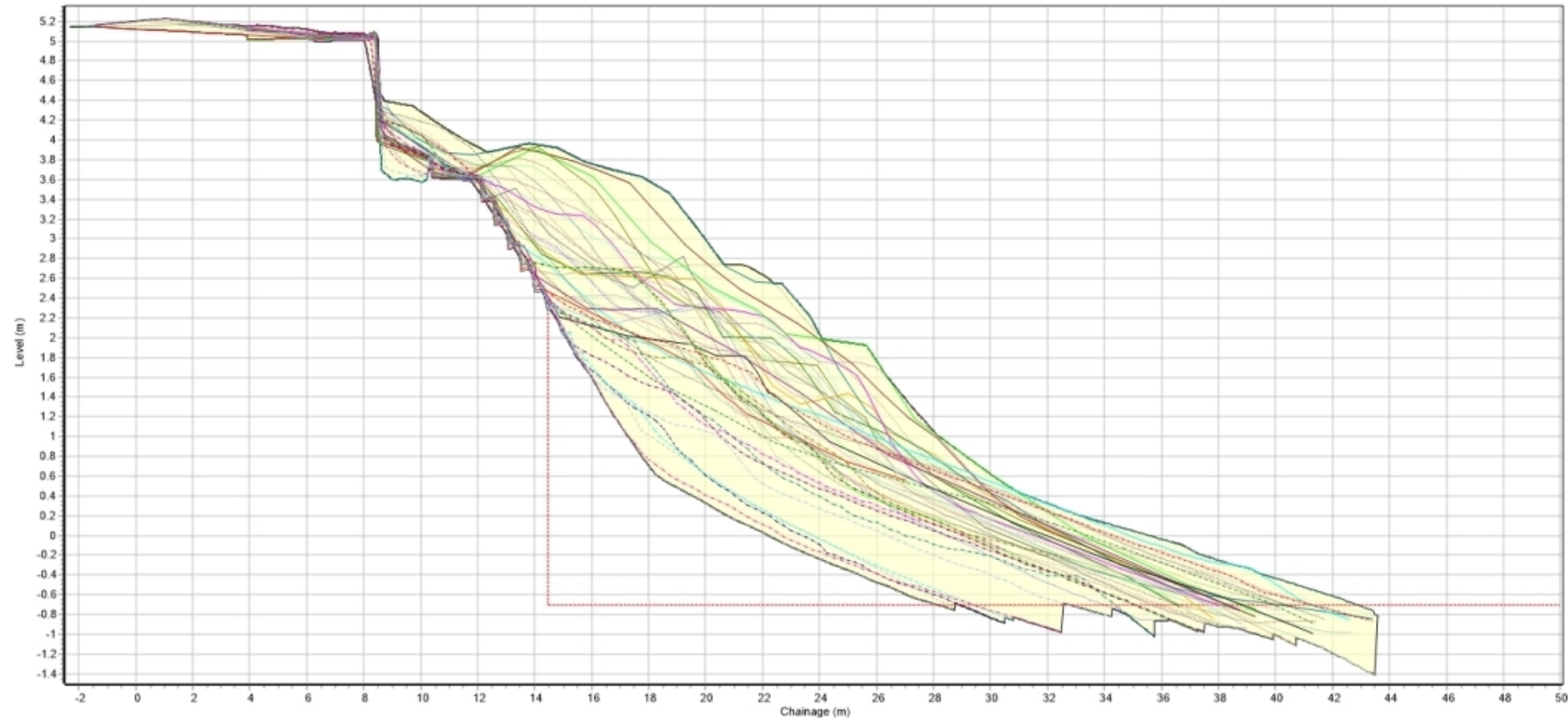
Profile surveys: Hordle, 23 February 2022



Topographic Data

Legacy: Profiles through time at Milford

Profiles: 5f00075



2022-10-27	2022-10-25	2022-09-14	2022-04-29	2022-03-25	2022-02-23	2022-02-22	2021-11-02	2021-07-26	2021-05-05	2021-04-14	2021-04-13	2020-11-13	2020-06-23	2020-05-07	2020-03-03
2020-02-26	2020-02-14	2020-02-05	2019-10-29	2019-08-20	2019-07-08	2019-06-18	2019-04-11	2019-04-10	2019-02-04	2018-09-28	2018-05-29	2018-05-11	2018-04-13	2017-09-20	2017-05-23
2017-04-13	2016-11-14	2016-09-22	2016-07-25	2016-07-22	2016-03-24	2016-03-23	2015-10-14	2015-07-20	2015-04-10	2015-04-02	2014-10-29	2014-09-10	2014-07-14	2014-03-04	2014-03-03
2014-02-10	2013-09-23	2013-06-21	2013-03-22	2013-03-01	2013-02-27	2012-11-23	2012-10-29	2012-07-25	2012-03-28	2012-03-26	2012-02-23	2012-01-04	Design Profile	Master Profile	Profile Envelope

Topographic Data

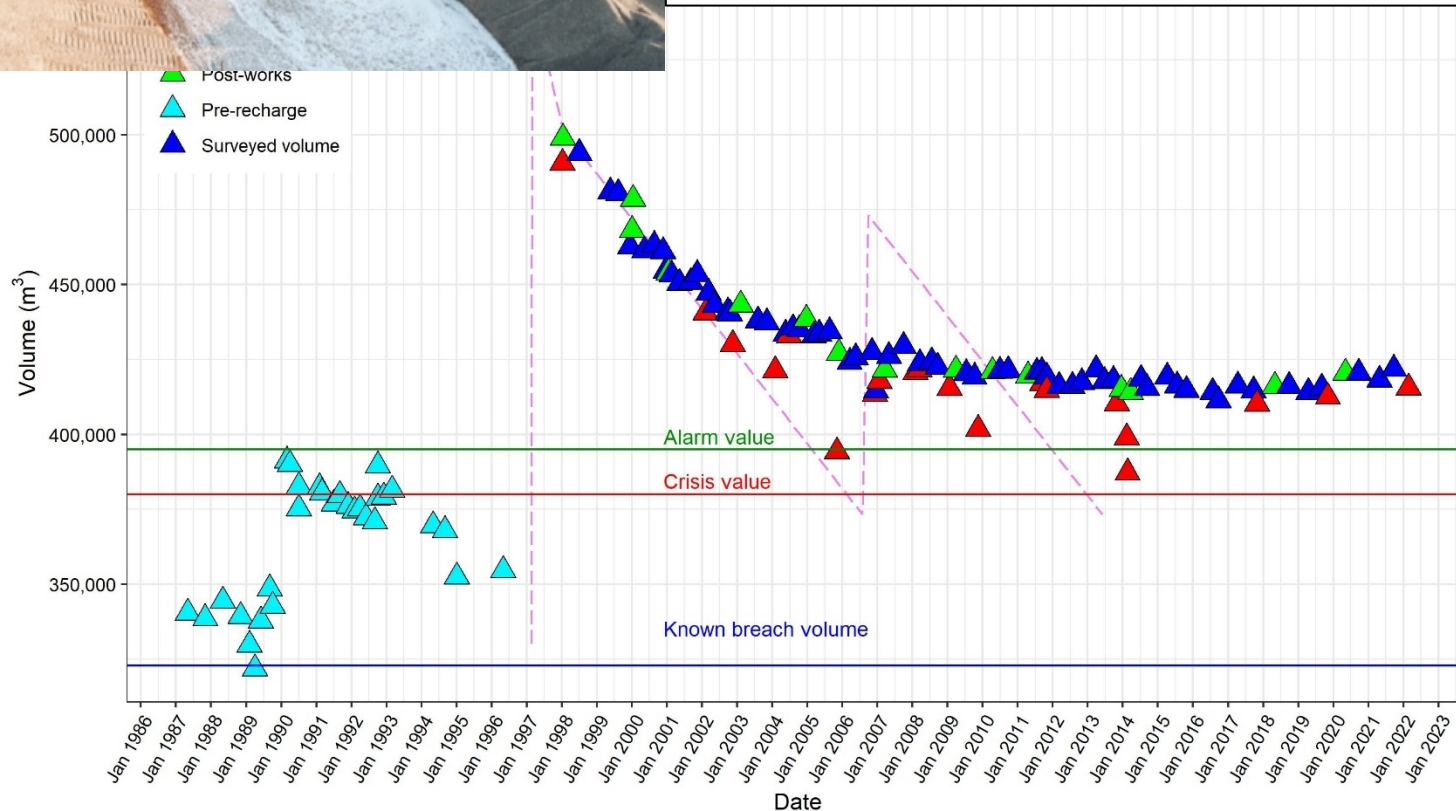


BMP implemented in 1996

50-year design life scheme with episodic recharge

➔ Monitoring informed a delay in recharge by over 5 years, resulting in large cost-saving

➔ Post-storm inform recovery of barrier after event



Topographic Data

Standard survey regime in NFDC area

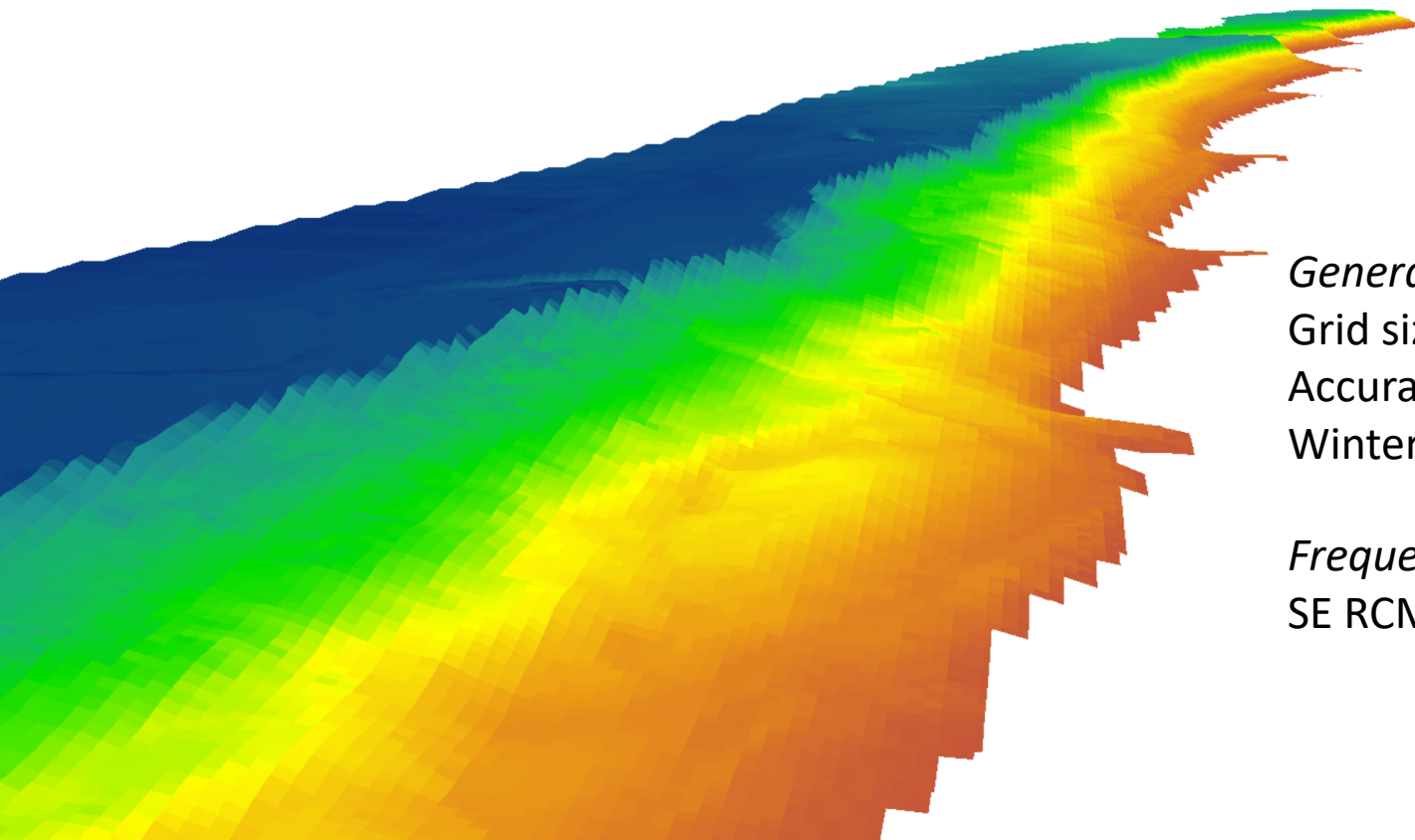
Survey Unit		2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
5cSU10	Calshot Spit	1 Profile	1 Profile	Baseline	1 Profile	1 Profile	1 Profile
5cSU11	Cadland			Baseline			
5cSU12	Lepe			Baseline			
5cSU13	Beaulieu River						
5cSU14	Park Shore/Gull Island			Baseline			
5cSU15	Sowley/Park Shore			Baseline			
5cSU16	Elmer's Court						
5cSU17	Lymington River						
5cSU18	Pennington						
5cSU19	North Point	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile
5fSU01	Hurst Spit	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile
5fSU02	Milford	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile	Baseline, 1 profile
5fSU03	Hordle	1 Profile	1 Profile	Baseline	1 Profile	1 Profile	1 Profile
5fSU04	Becton to Hordle			Baseline			
5fSU05	Naish to Barton		Baseline				

LiDAR year

Lidar Data

Provided in kind by the EA's Geomatics team

Barton Cliffs in 2017 Lidar capture



General:

Grid size: 1m

Accuracy: +/-0.2m

Winter, leaf off

Frequency:

SE RCMP: Every other year

Lidar Data

Example: National Coastal Erosion Risk Map 2

Lidar data used to assess cliff recession rates



Aerial Photography

General: GSD: 0.1m | MLWS | Summer, leaf on

Frequency: Every two years (2022, 2025)

Barton Cliffs throughout the years: 2008



Aerial Photography

General: GSD: 0.1m | MLWS | Summer, leaf on

Frequency: Every two years (2022, 2025)

Barton Cliffs throughout the years: 2013



Aerial Photography

General: GSD: 0.1m | MLWS | Summer, leaf on

Frequency: Every two years (2022, 2025)

Barton Cliffs throughout the years: 2016



Aerial Photography

General: GSD: 0.1m | MLWS | Summer, leaf on

Frequency: Every two years (2022, 2025)

Barton Cliffs throughout the years: 2019

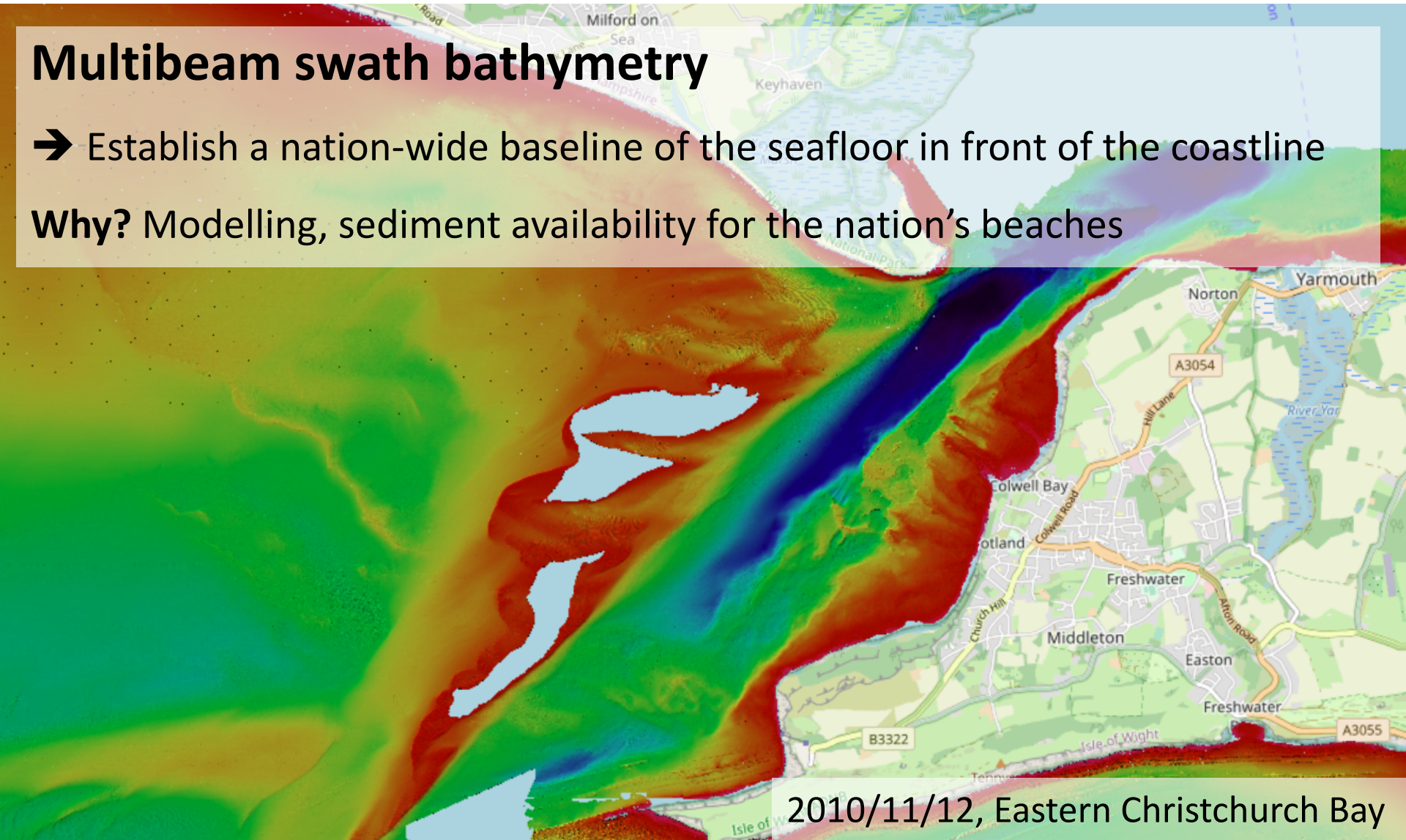


Bathymetry

Multibeam swath bathymetry

→ Establish a nation-wide baseline of the seafloor in front of the coastline

Why? Modelling, sediment availability for the nation's beaches



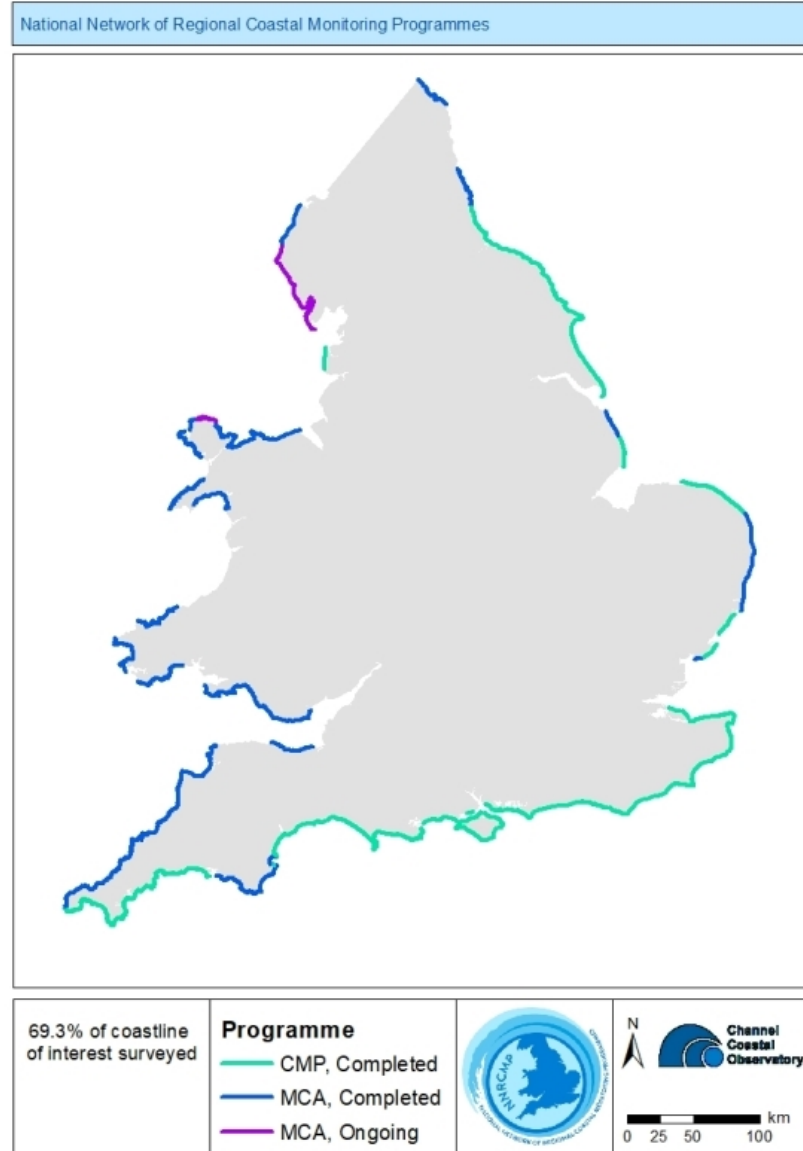
Bathymetry

Filling the 'white ribbon'

~70% nationwide coverage

90+% coverage in Southeast

➔ Collaboration with the MCA and UKHO



Bathymetry

Partnership with MCA and UKHO

Extend CHP surveys 'inshore' to include areas of interest to the RMA's

IHO Order 1a standard data

→ QA by the UKHO

Share the cost of procurement of swath bathymetry surveys for areas of mutual interest

→ Optimize public expenditure

Data is made freely available via the coastal monitoring website



MEMORANDUM OF AGREEMENT BETWEEN

New Forest District Council,

Teignbridge District Council,

Metropolitan Borough Council of Sefton,

Scarborough Borough Council,

East Riding of Yorkshire Council

and

Maritime & Coastguard Agency

March 2022

Sefton Council 

 **SCARBOROUGH**
BOROUGH COUNCIL

 **Teignbridge**
.gov.uk

 **EAST RIDING**
OF YORKSHIRE COUNCIL


Maritime &
Coastguard
Agency

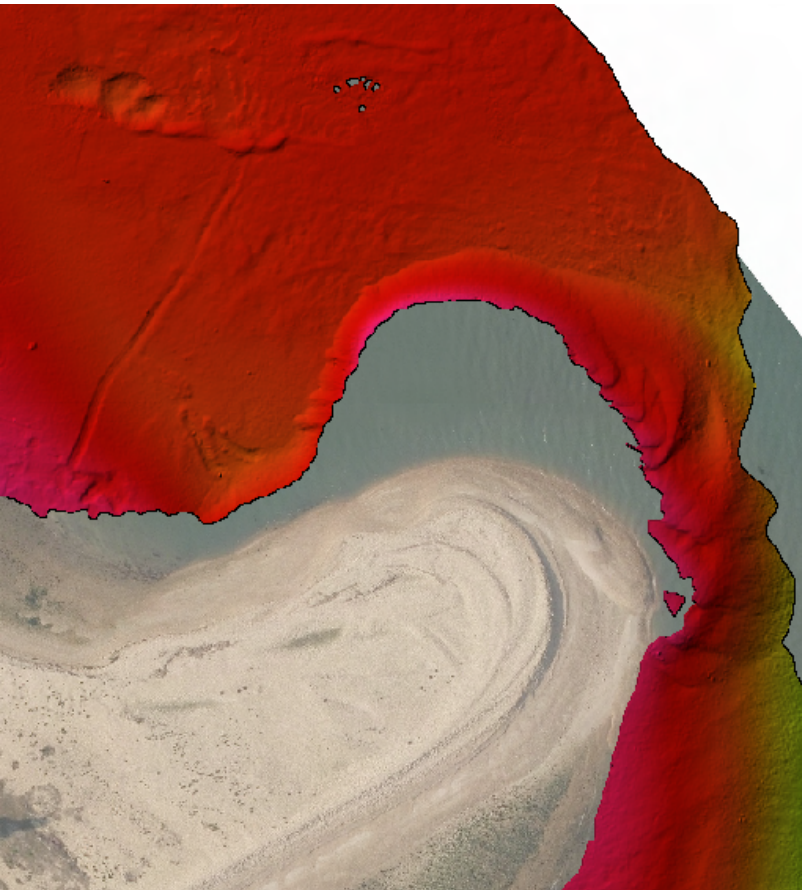
 **New Forest**
DISTRICT COUNCIL

Bathymetry

Frequency: Christchurch Bay (2023), West Solent (2023)

In-house multibeam

➔ **Norbit iWBMS**



Asset Register

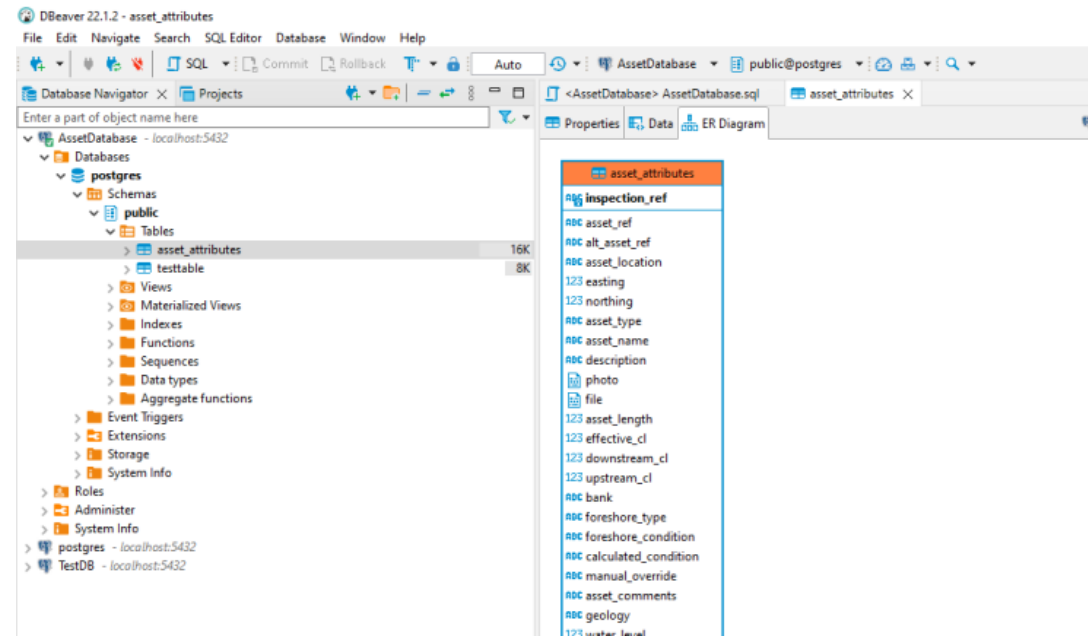
Introduced in Phase III (2021-2027)

Composition of an asset register

- ➔ Inform the EA's strategic overview of coastal risk
- ➔ Gap in current national database provision of asset presence and condition

T98 inspection training provided to 35 delegates across 16 LA's

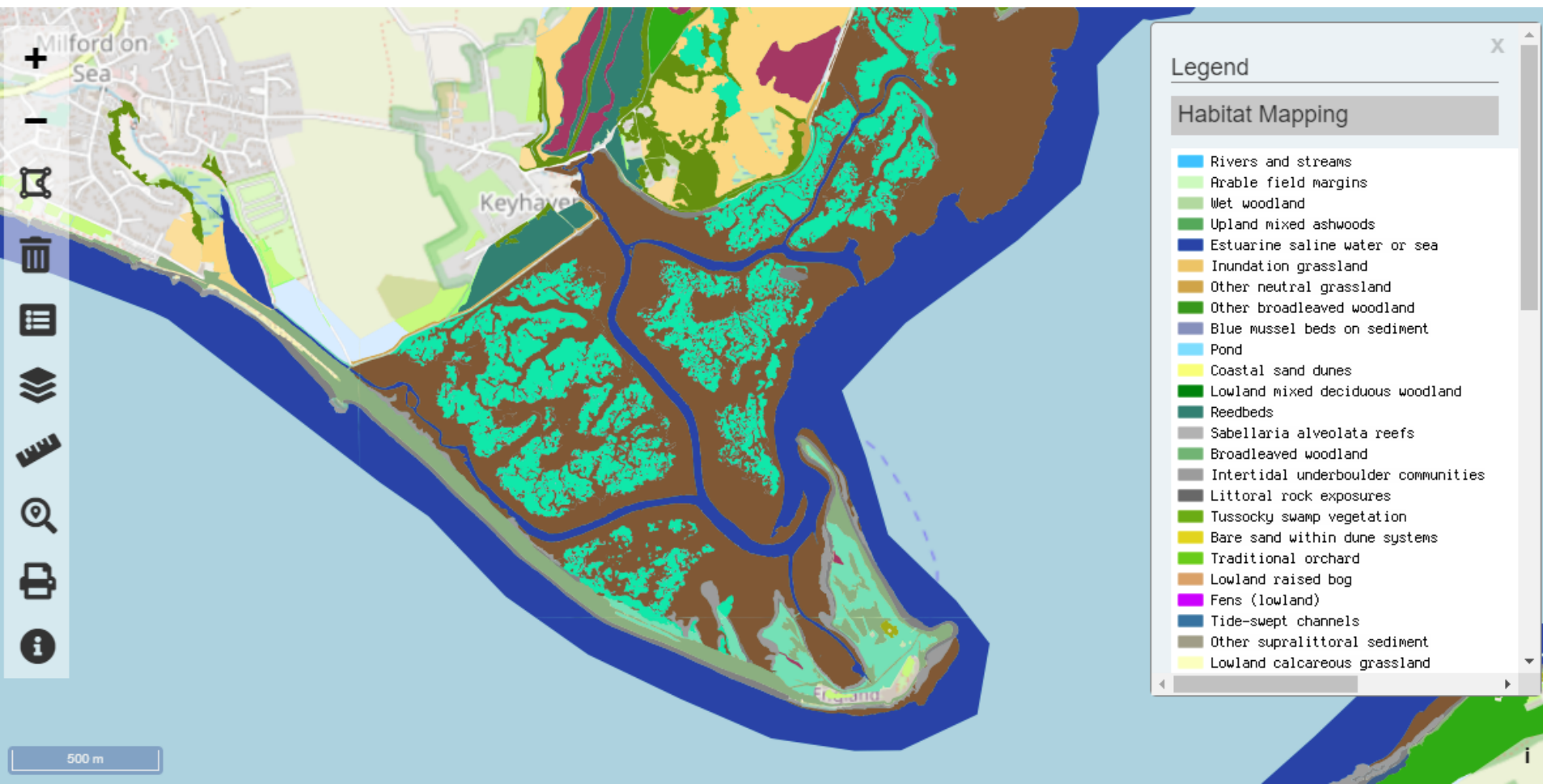
Collation of local asset databases



Habitat Mapping

Frequency: Once per phase (2026)

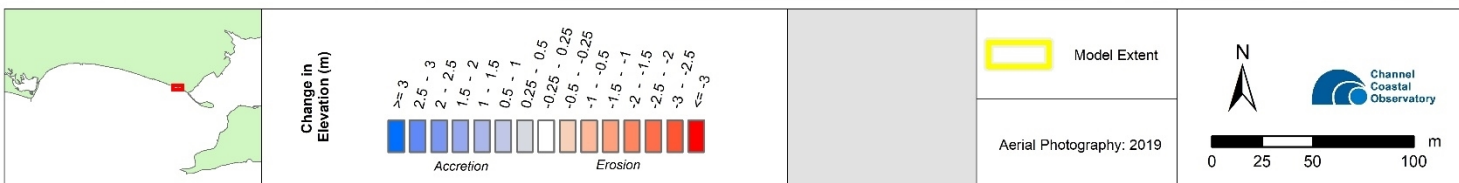
Why? Examples: Habitat compensation, adaptation



Incident Response

Baseline post storm: Milford, 20 August 2019

Southeast Regional Coastal Monitoring Programme



Change in elevation (Topographic Difference Model) - Post-works 08/07/2019 to Post-storm 20/08/2019

Milford-on-Sea: 5fSU02

Incident Response

Asset scan: Hurst Castle, 5 March 2021



Incident Response

Post-storm UAV survey: Hordle, 25 March 2022

Ortho-photo from UAV

Monitor the positions of the beach huts after storms Eunice and Franklin in February 2022



NFDC Surveying



Barton Cliffs Monitoring: 1995 - ongoing *Frequency: Monthly*

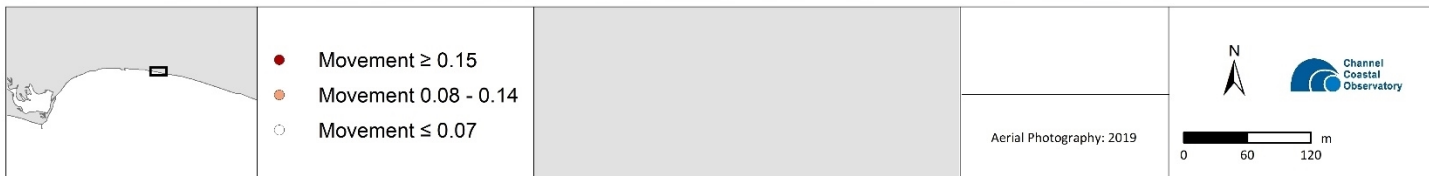


NFDC Surveying

Barton Cliffs Monitoring

Frequency: Monthly

Barton Cliffs 25/02/2022 - 23/03/2022



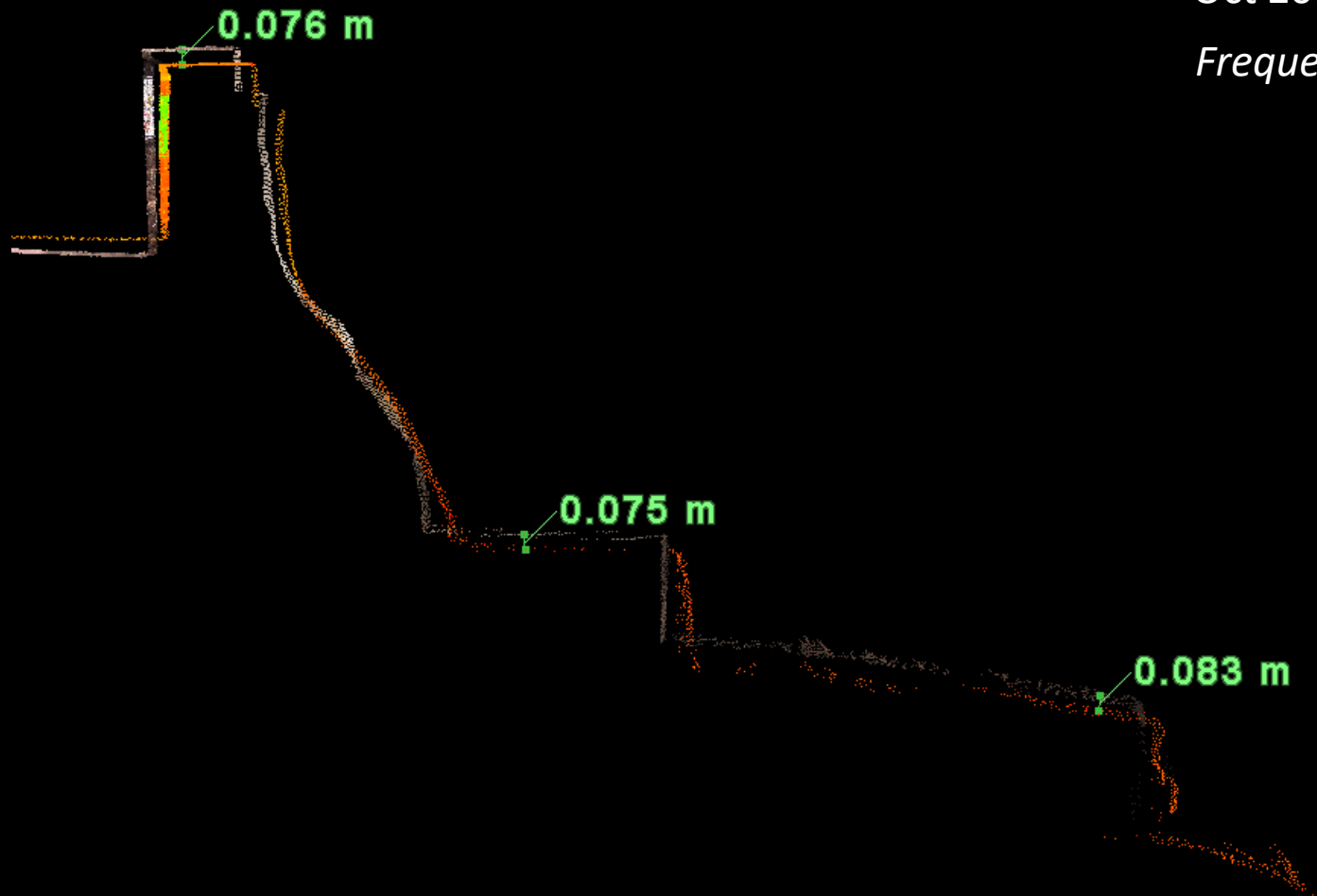
Barton-on-Sea

NFDC Surveying

Lymington Seawall monitoring

Oct 2016 – Feb 2022

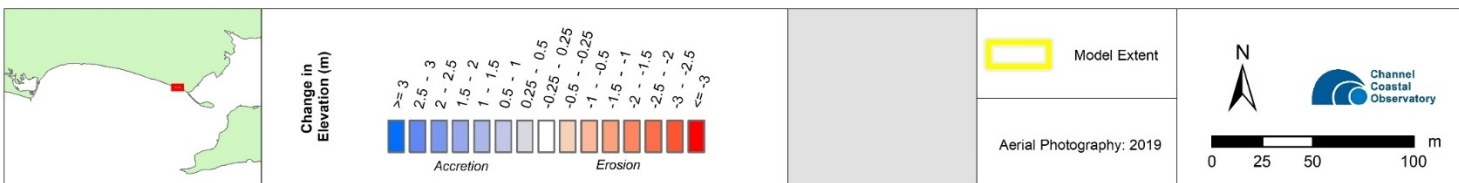
Frequency: quarterly



NFDC Surveying

Pre and post beach nourishment work surveys

Southeast Regional Coastal Monitoring Programme



Change in elevation (Topographic Difference Model) - Pre-works 14/09/2022 to Post-works 25/10/2022

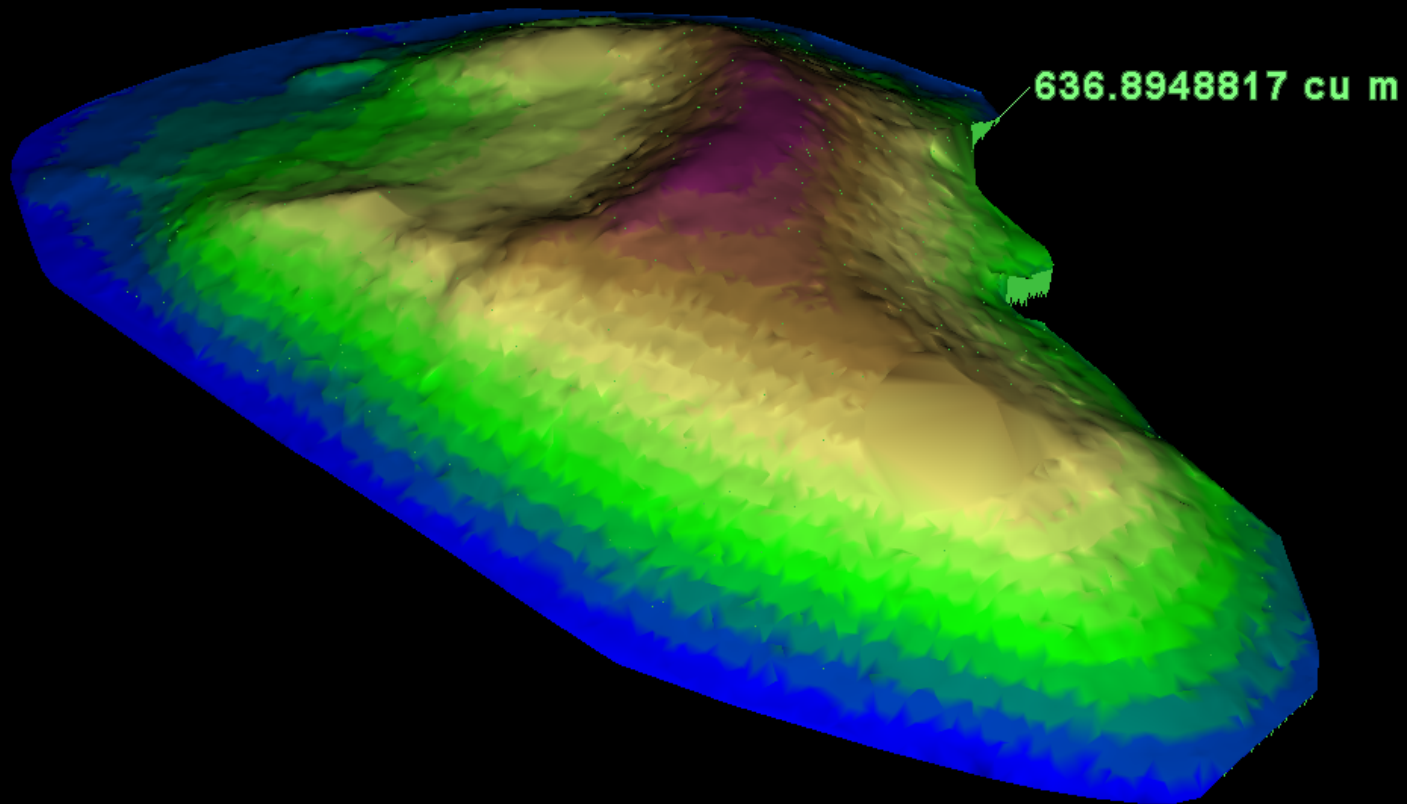
Milford-on-Sea: 5fSU02

NFDC Surveying



Calshot stockpile volume measurements

4th January 2023



Innovation

Trials of new ocean technologies:
Datawell CAT4 temperature
4D Ocean ASV Harry



Southeast RCMP Programme Update

Phase III: 2021-2027

Data collected so far:

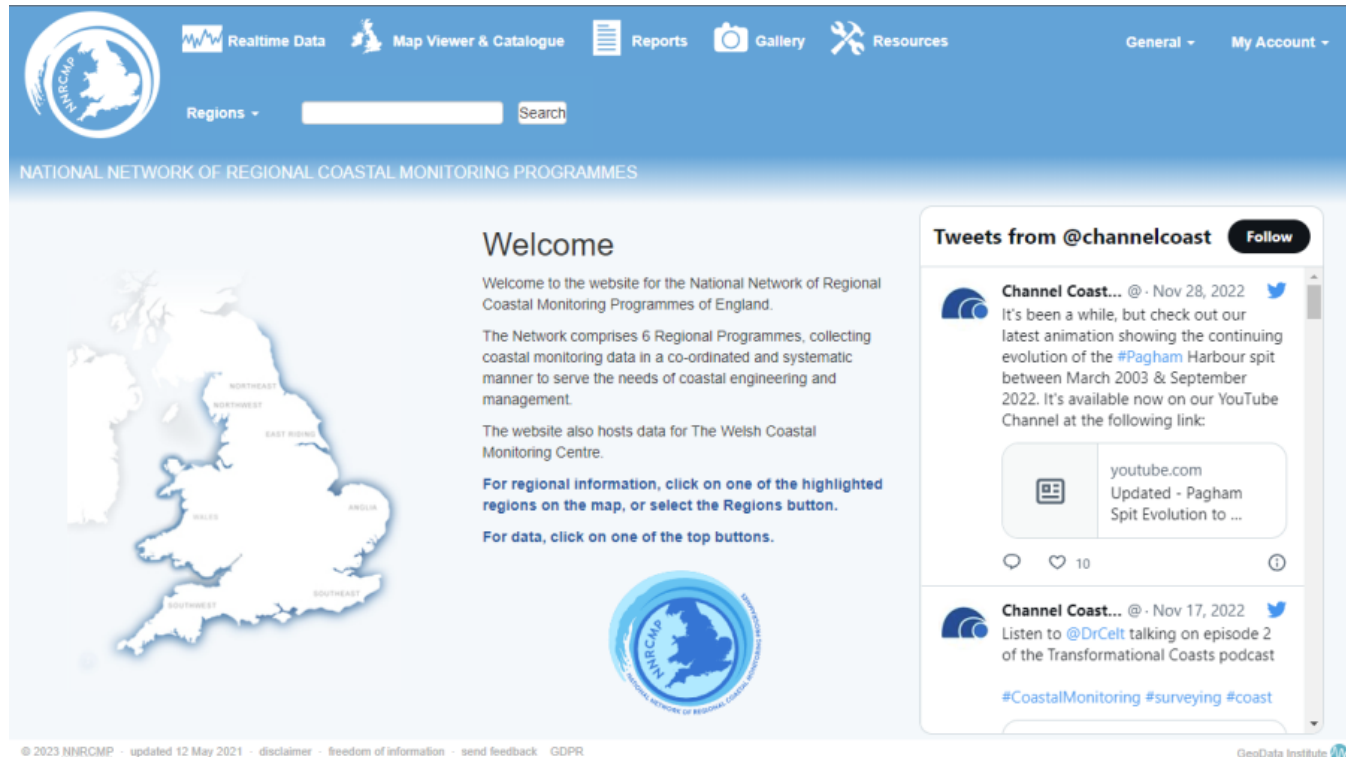
- 21 years of wave data, 14 years of tide data and 17.5 years of meteorological data
- 101 beach profile surveys, 59 baseline surveys
- Full LiDAR capture (2021/23)
- Full Aerial photography capture (2022)

Planned for 2023-2027:

- Continued wave, tide and met real-time data
- 473 beach profile surveys, 357 baseline surveys
- 2 epoch of full LiDAR capture
- 1 epoch of aerial photography (2025)
- Swath bathymetry programme (incl. Christchurch Bay, West Solent)

Questions

www.coastalmonitoring.org



The screenshot shows the homepage of the National Network of Regional Coastal Monitoring Programmes (NNRCMP). The header includes navigation links for Realtime Data, Map Viewer & Catalogue, Reports, Gallery, and Resources, along with user options for General and My Account. A search bar and a Regions dropdown menu are also present. The main content area features a map of the United Kingdom with regional labels (NORTH EAST, NORTH WEST, EAST RIDING, WALES, BRISTOL, SOUTH WEST, SOUTH EAST) and a 'Welcome' message. The welcome message states: 'Welcome to the website for the National Network of Regional Coastal Monitoring Programmes of England. The Network comprises 6 Regional Programmes, collecting coastal monitoring data in a co-ordinated and systematic manner to serve the needs of coastal engineering and management. The website also hosts data for The Welsh Coastal Monitoring Centre. For regional information, click on one of the highlighted regions on the map, or select the Regions button. For data, click on one of the top buttons.' A tweet from @channelcoast is displayed on the right, mentioning a YouTube video about Pagham Spit Evolution. The footer contains copyright information for NNRCMP (2023) and a feedback button.

We would appreciate your feedback on the Website and Map Viewer [Feedback](#)

cco@noc.soton.ac.uk