Coastal Futures – January 2019

Graeme Smith

Teignbridge District Council

South Devon and Dorset Coastal Authorities Group

South West Coastal Group

South West Regional Coastal Monitoring Programme

Teign Estuary and Coastal Partnership

Coastal Local Authorities

District/County/Unitary

Planning (to MLW)

Economic development

Harbour Authorities

Significant Coastal Asset owners / Landowners

Licensing and consenting a wide range of activities

Public Health and wellbeing

Safeguarding and welfare

Inshore Byelaws

Tourism

Transport

Emergency planning and response

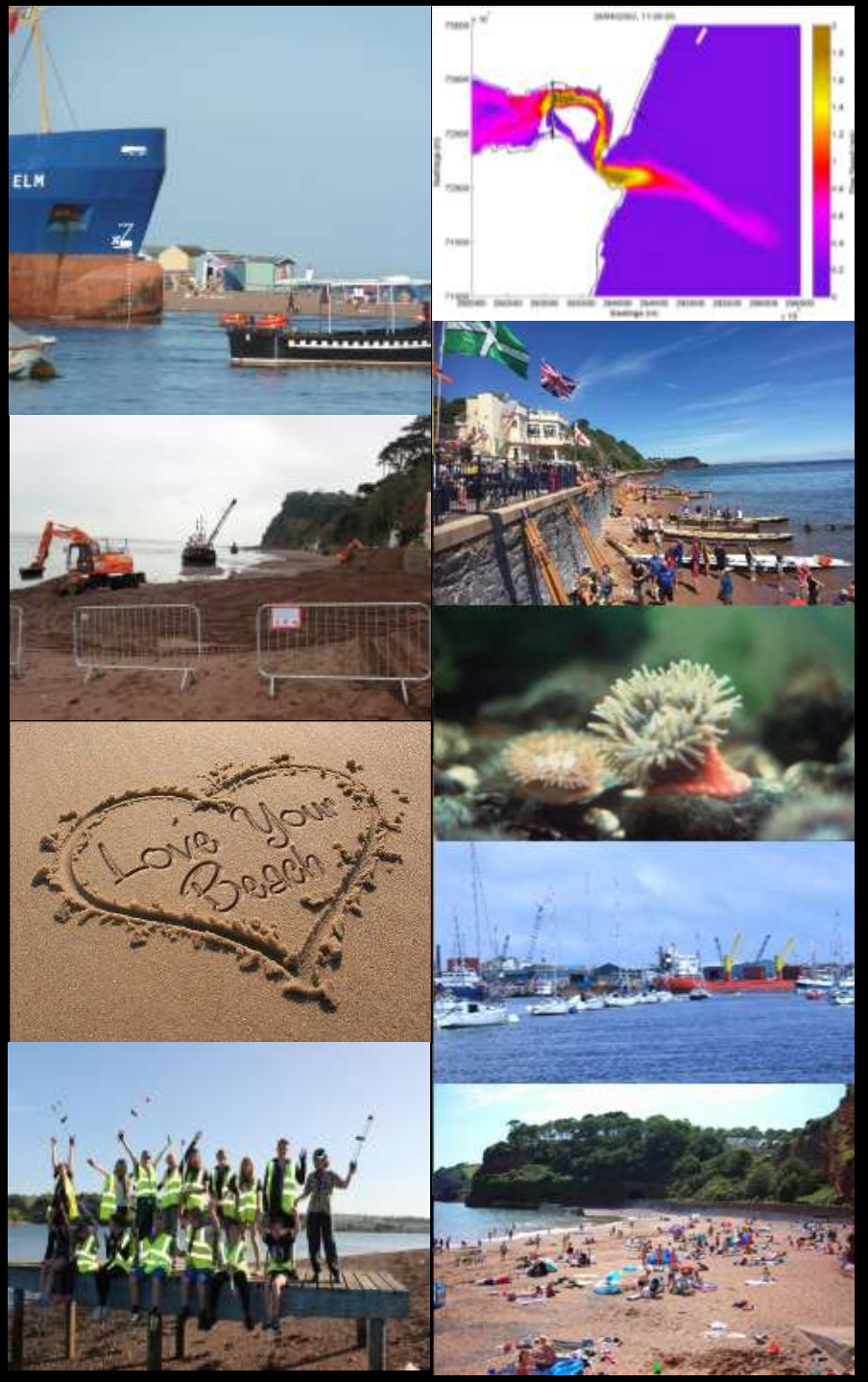
Heritage

Refuse and Litter / plastic free initiatives

Resort and Beach Management

Water quality – Bathing waters and Shellfisheries

Access and Leisure



One of the many, many roles is managing Coastal Erosion

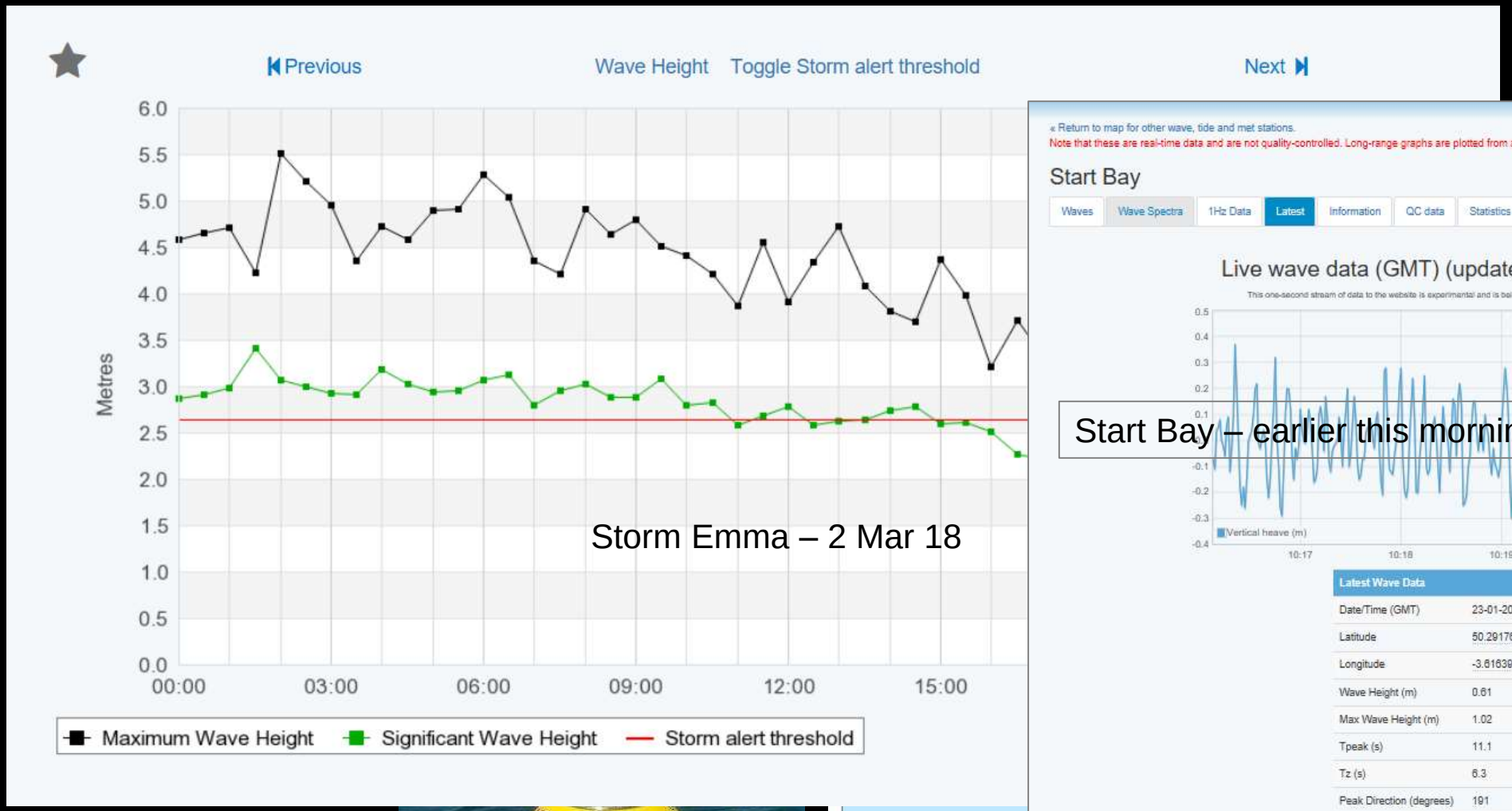
Coast Protection Act – gives powers to Districts or Unitary Council regarding eroding coasts.

To manage - you need to measure or predict dynamic change / risk

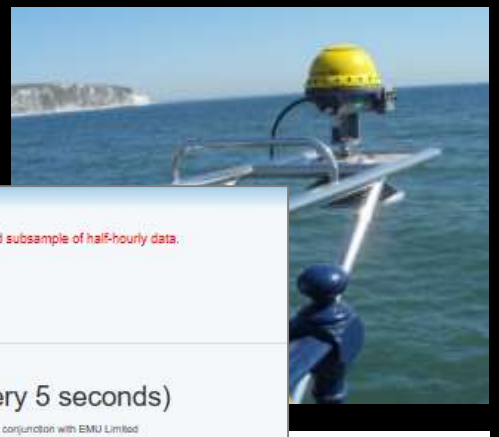
South West Regional Coastal Monitoring Programme

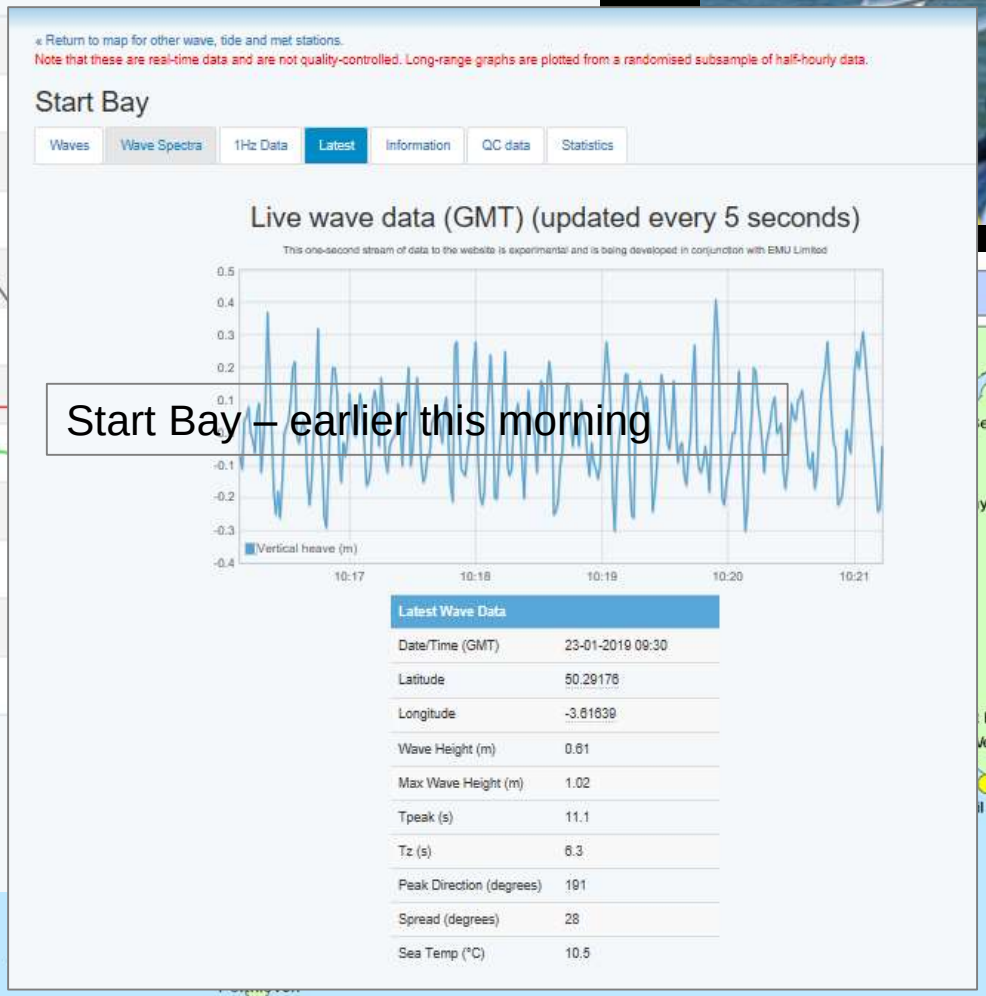
PLYMOUTH COASTAL OBSERVATORY

Data - Wave buoys and Wave radars / Step Gauges



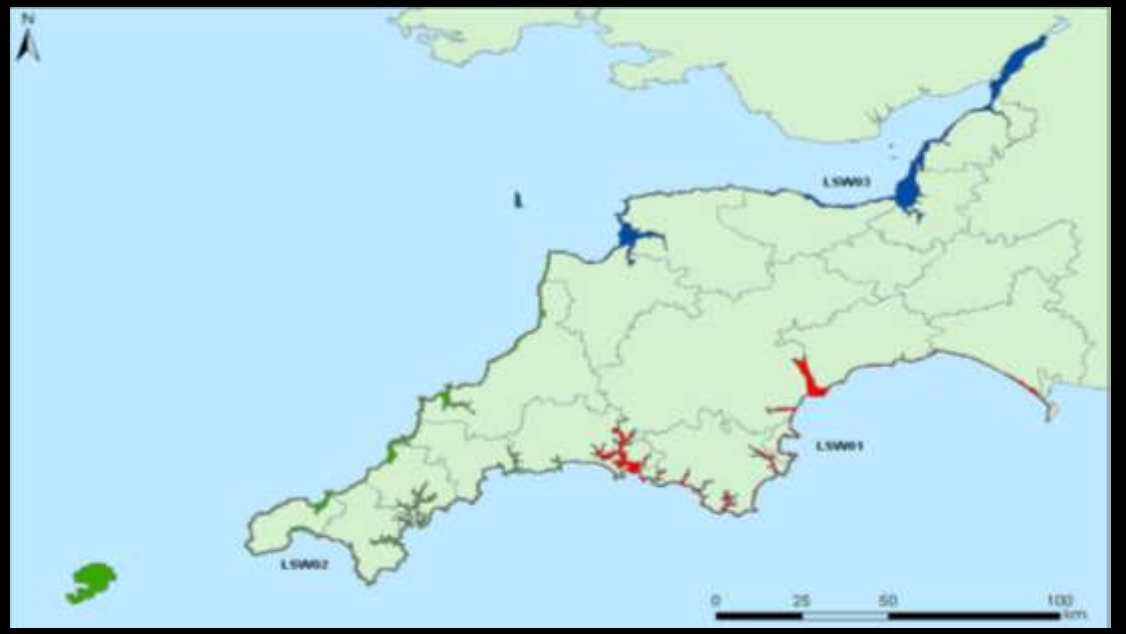
Storm Emma – 2 Mar 18



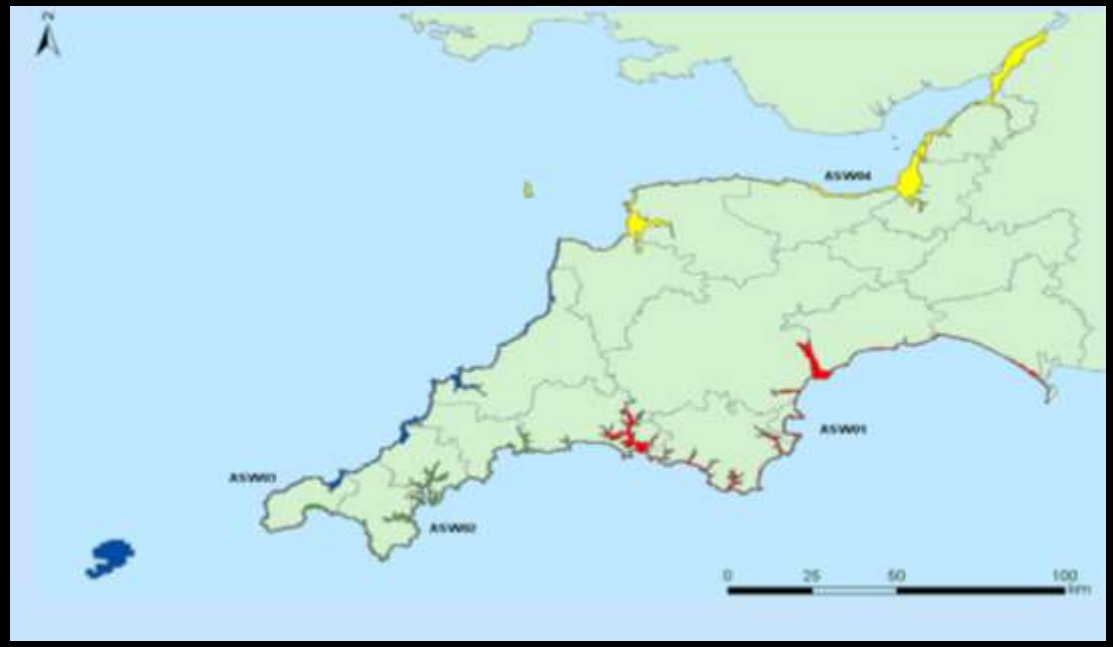


Start Bay – earlier this morning

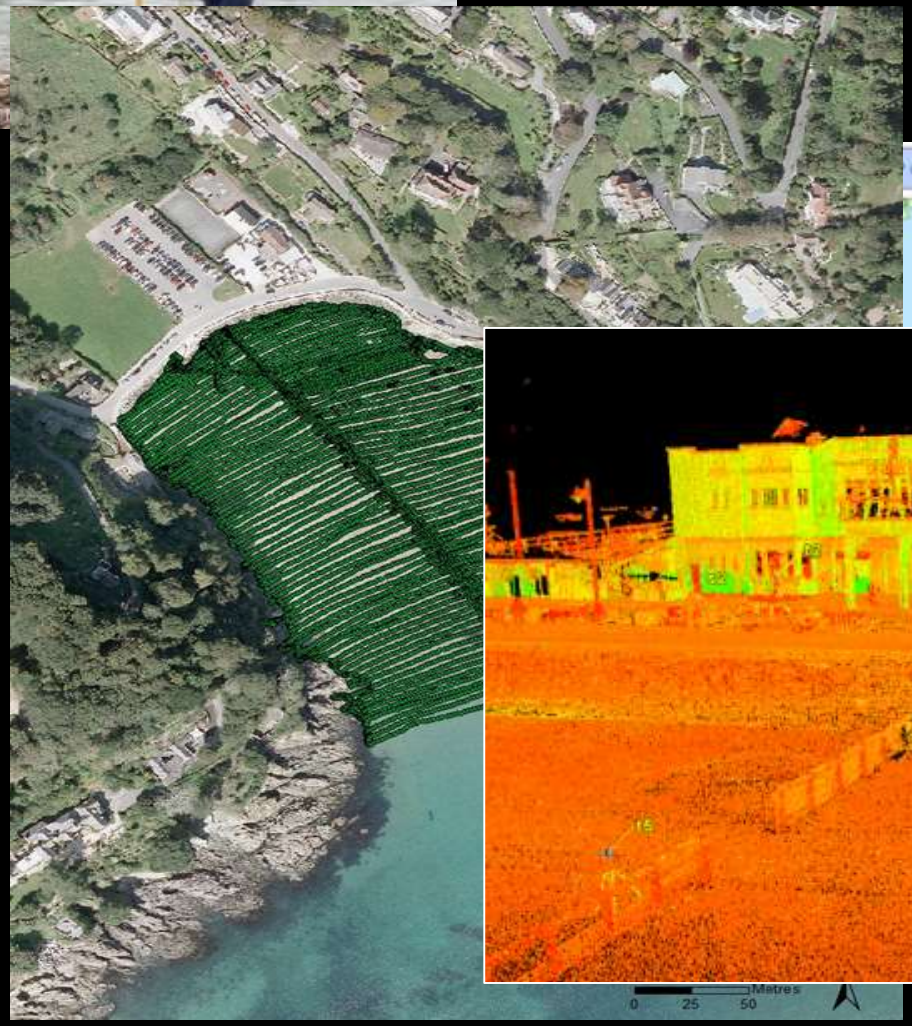
Lidar



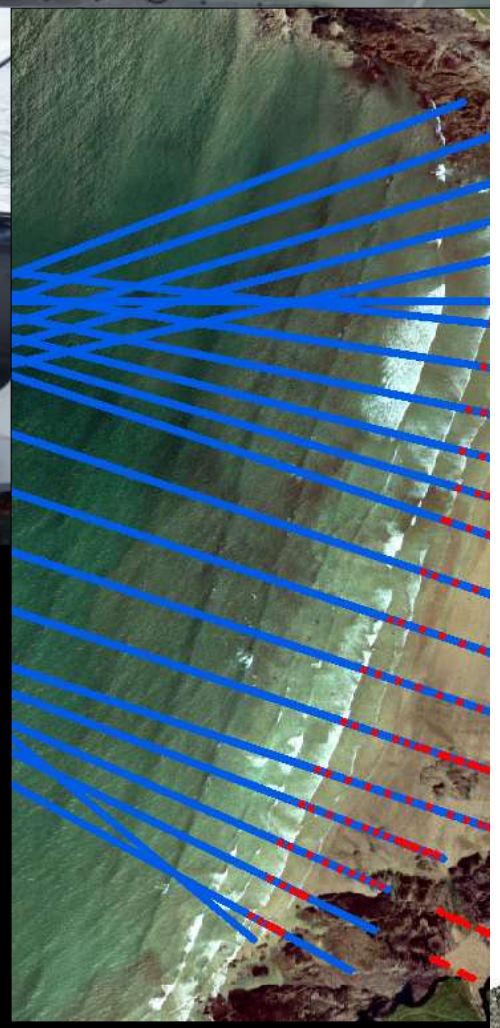
Aerial photography

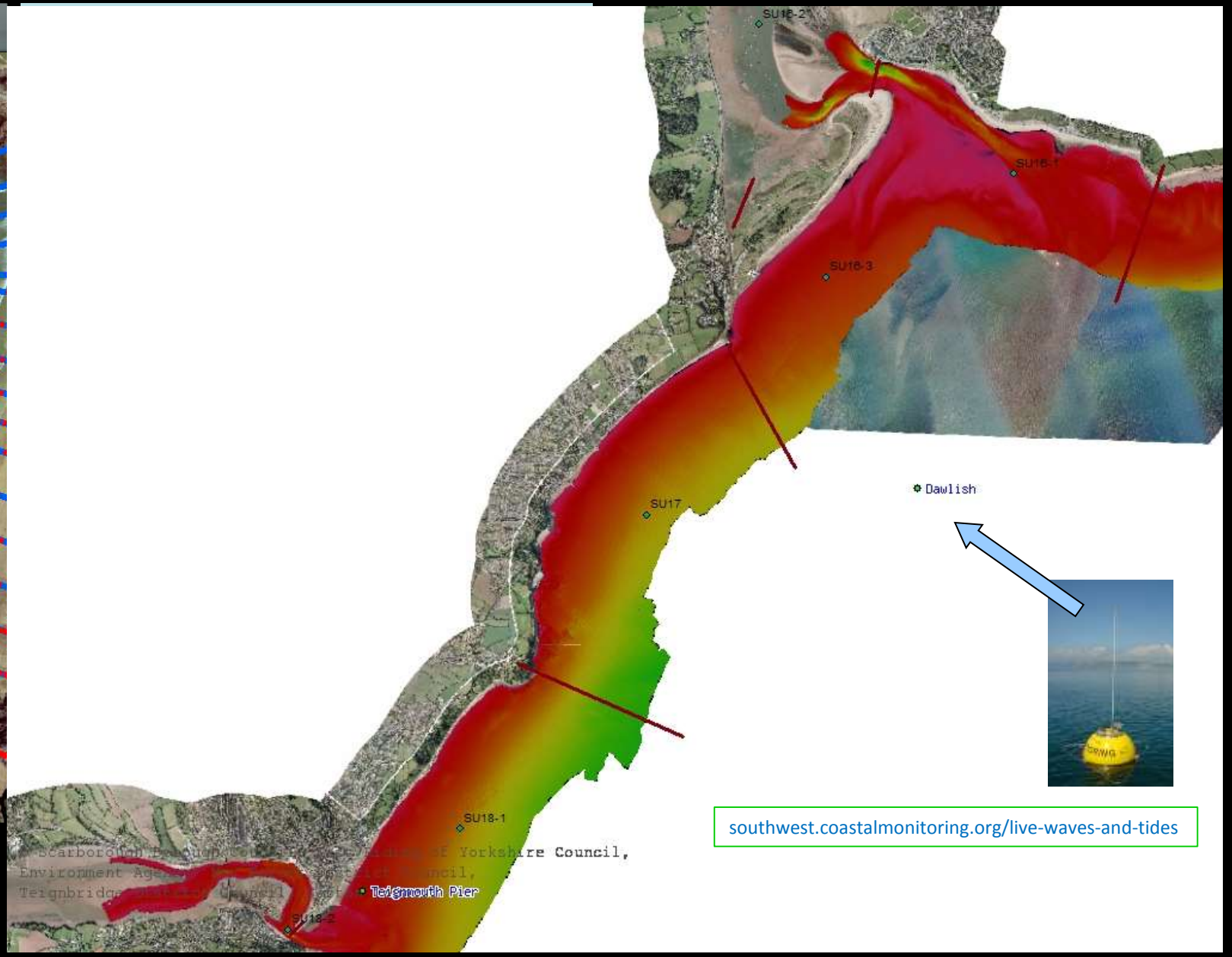


Topographic surveys



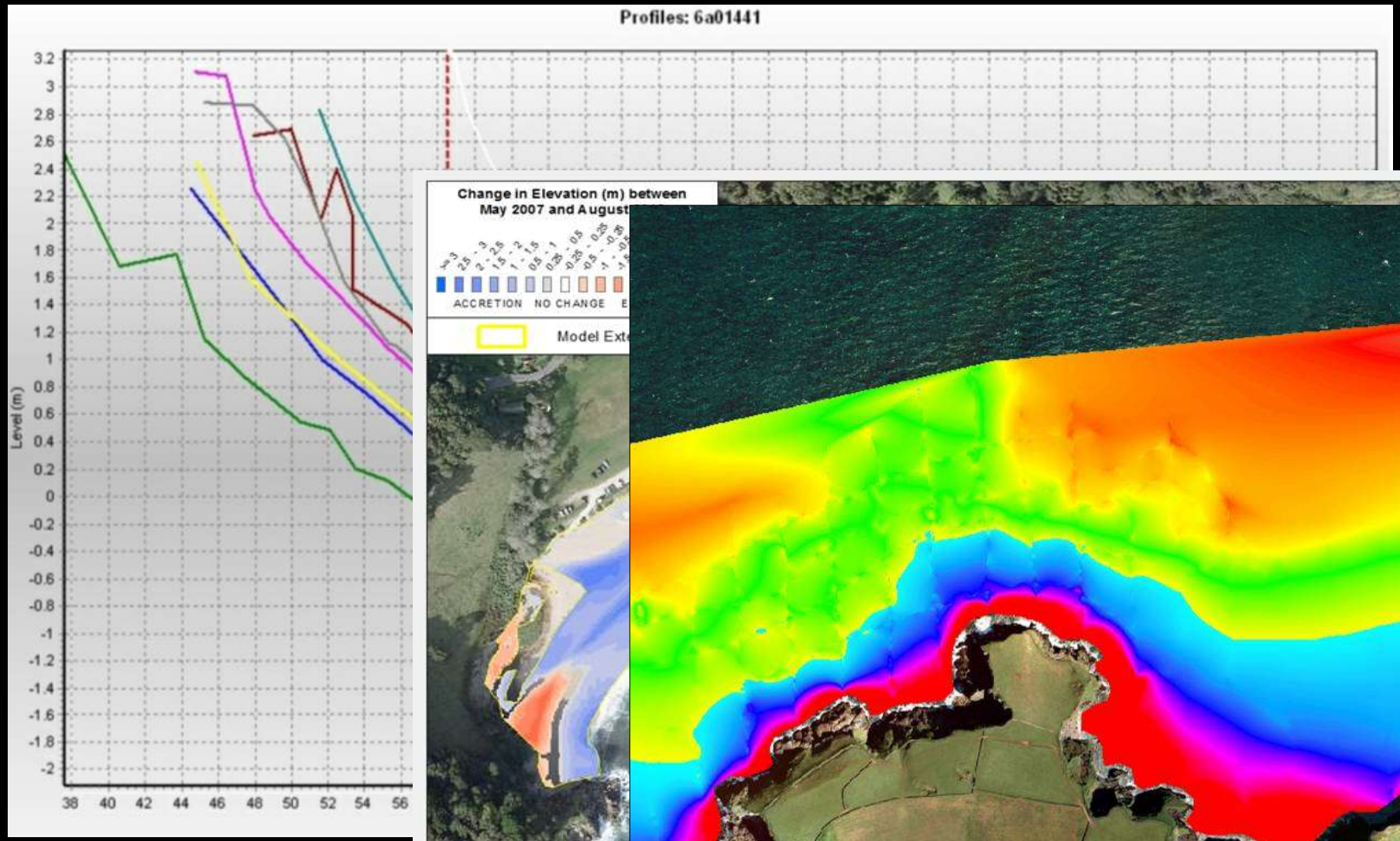
Bathymetric Surveys

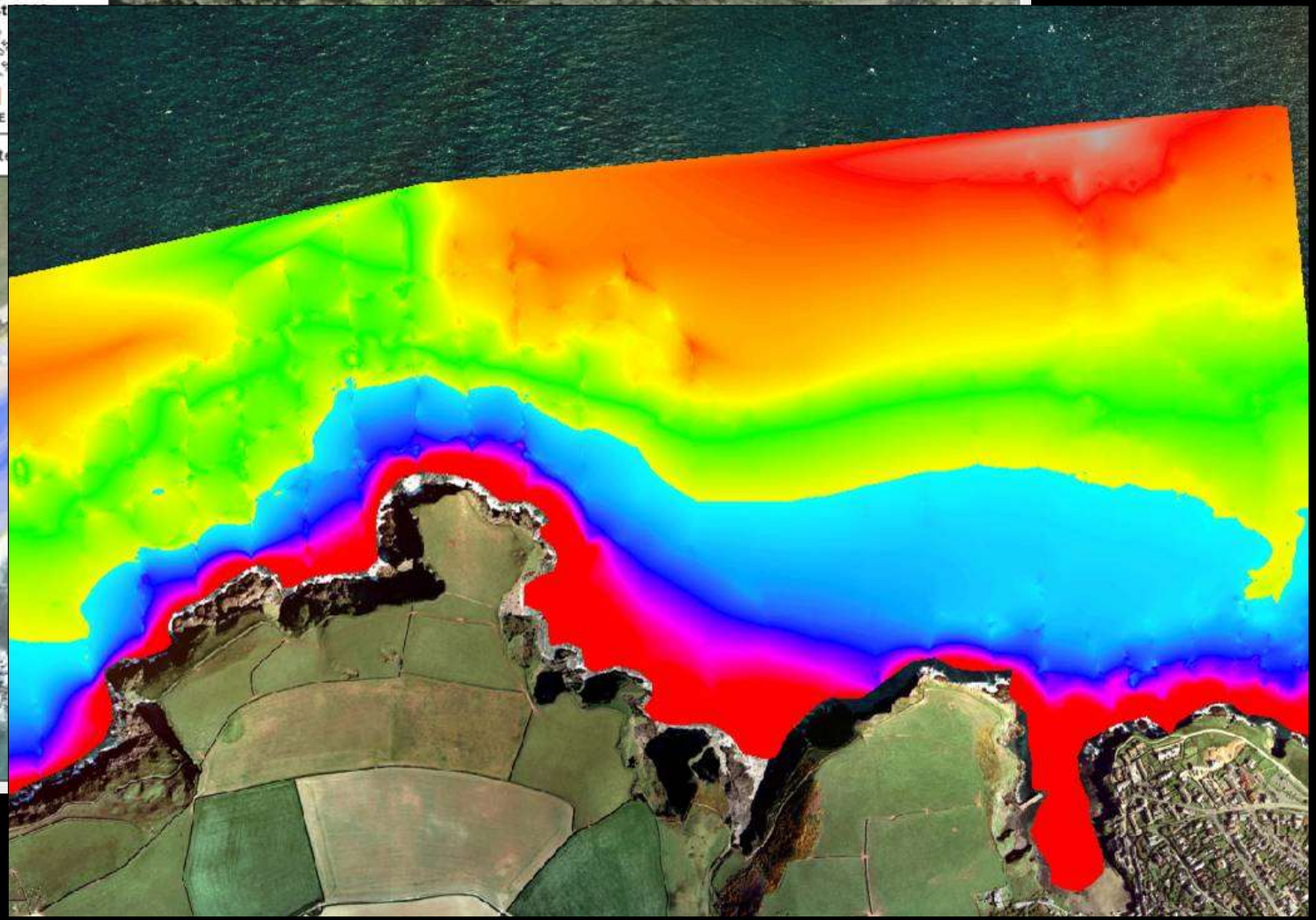




southwest.coastalmonitoring.org/live-waves-and-tides

analysis and trends – cliff regression, beach changes, sediment bars





Shoreline Management Plan

SMPs seek to promote ‘sustainable shoreline management policies’ for a coastline into the 22nd century considering various timescales (epochs).

0 to 20 years (short term)

20 to 50 years (medium term)

and 50 to 100 years (long term)

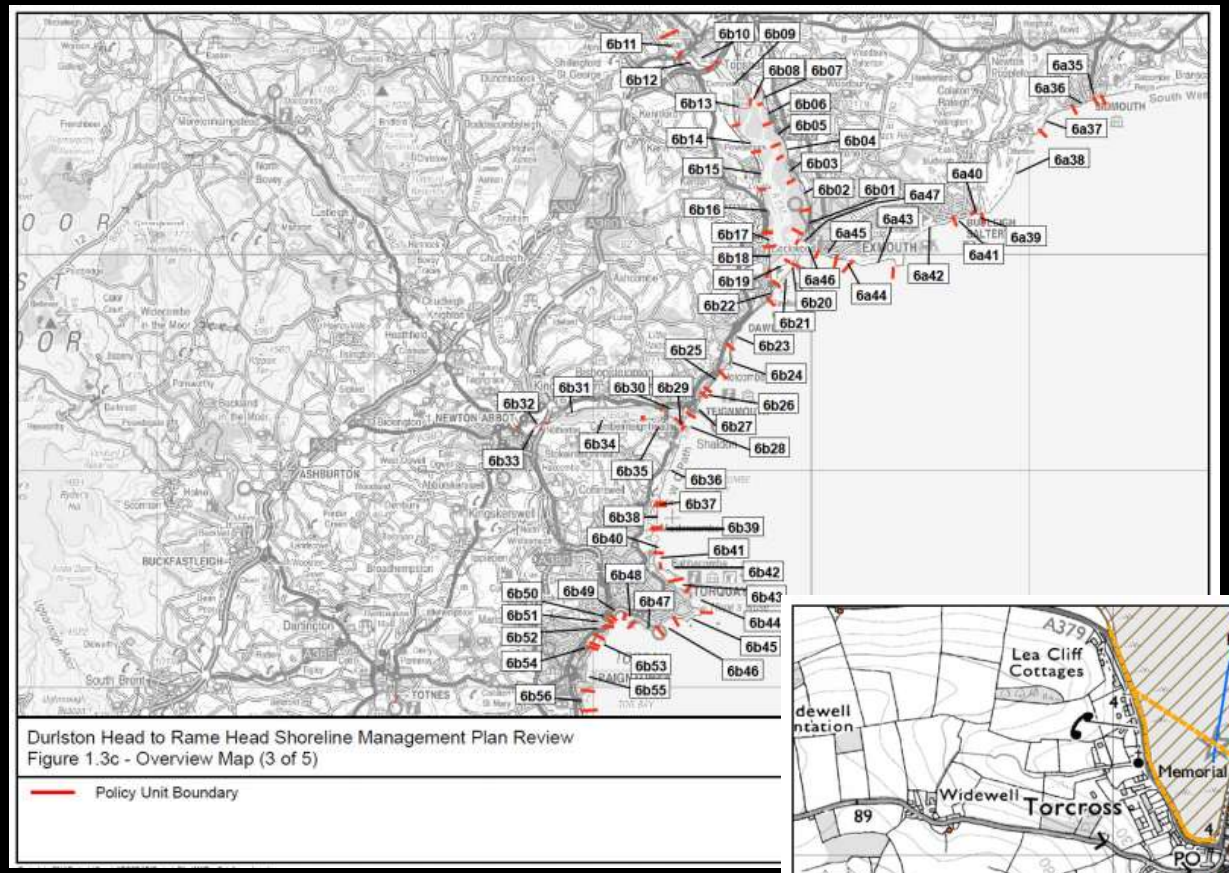
One of four basic SMP2 policies to be adopted in each individual Unit to achieve management objectives:

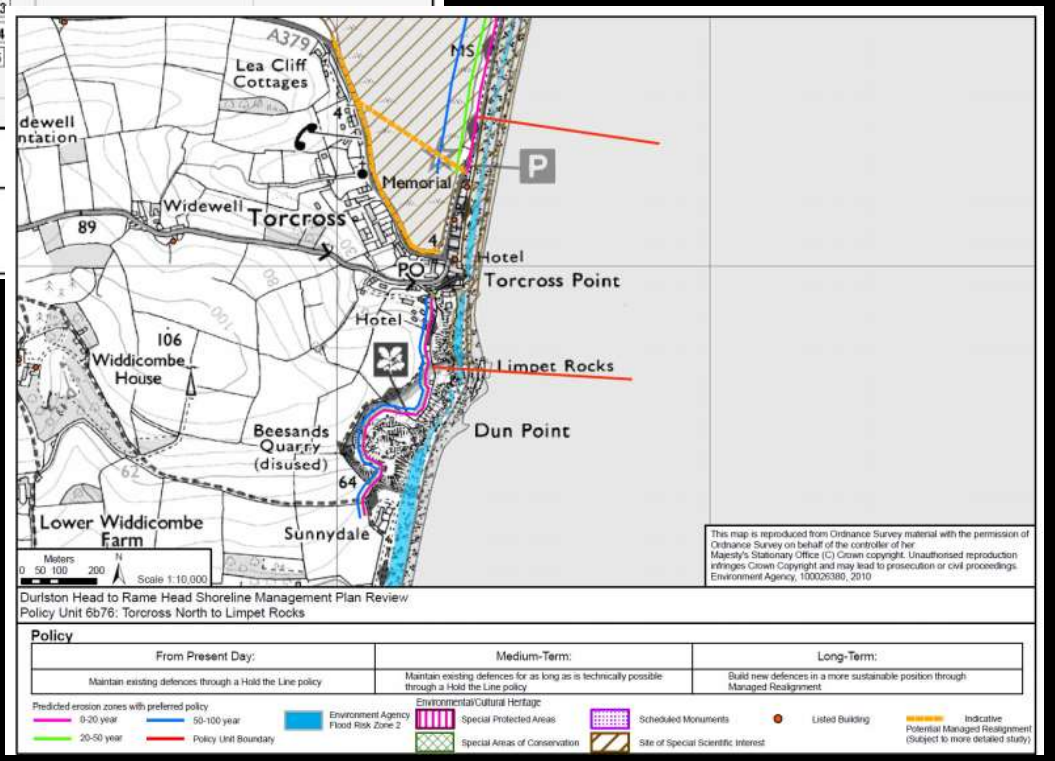
Hold the existing defence line;

Advance the existing defence line;

Managed realignment;

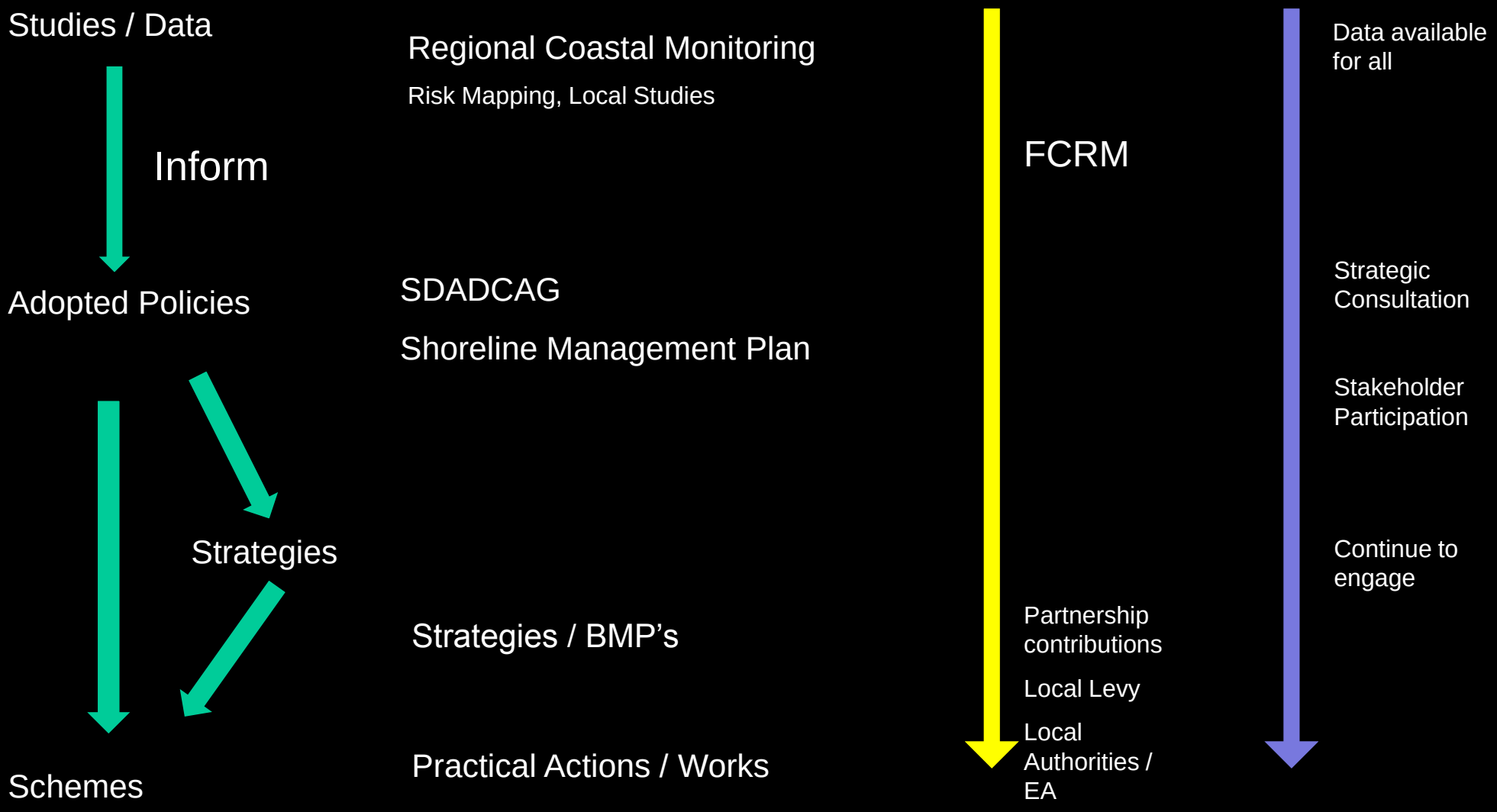
No active intervention.





Detail for Individual Policy Units also show erosion information

Data, Studies, Policies, Strategies, Schemes, Funding



England has 20 SMPs covering all 10,000km of coastline

Internationally regarded as model strategic planning for the coast , however

Most were completed 6-12years ago and have had varying levels of retest/update to maintain intended ‘living’ document status

2017 national desktop review indicated a significant proportion of Policy Units warrant further analysis since SMP2 publication

20% Hold the Line – recommended for scrutiny, around a third of these due to funding criteria

12% No Active Intervention – largely due to likelihood of challenge and difficulties around adaptation to change

42% Managed Realignment - largely through evidence of coastal evolution and also funding

A refresh of SMPs has also been highlighted by

- The National Infrastructure Assessment 2018
- The government’s 25 Year Environment Plan 2018
- The government’s National Adaptation Programme 2018

Additional relevant initiatives

Defra – review of National Policy Statement for FCRM – consultation expected April

EA – developing FCRM Strategy for England and preparation for future

capital investment programme

National Planning Policy Framework (2018)

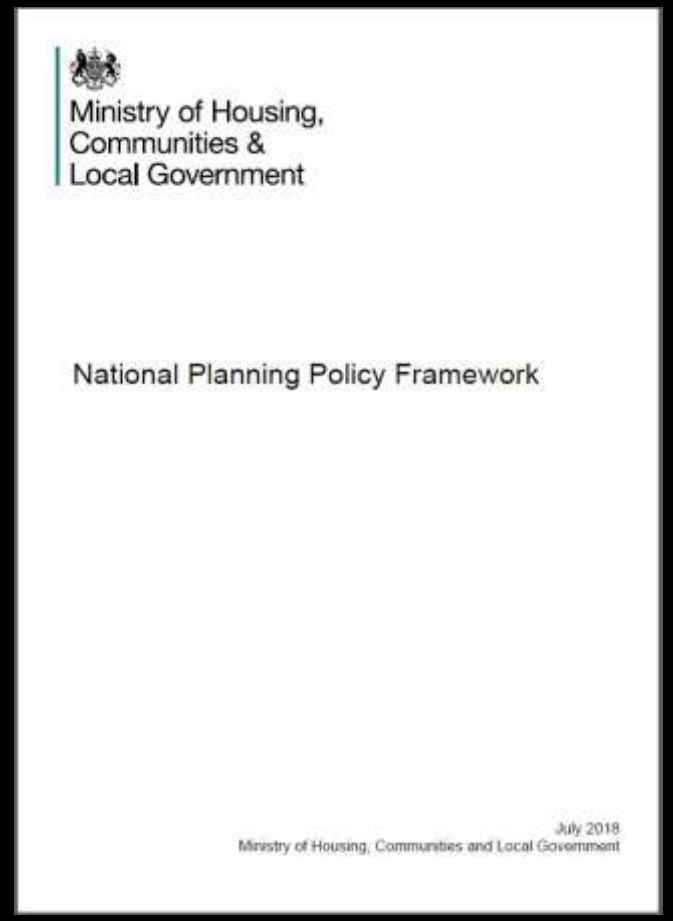
Overarching presumption in favour of sustainable development

Coastal Change s. 166-169

Encourages ICZM

Identification of Coastal Change Management Areas (CCMA's) for any area likely to be affected by physical changes to the coast – direct link with SMP policy units

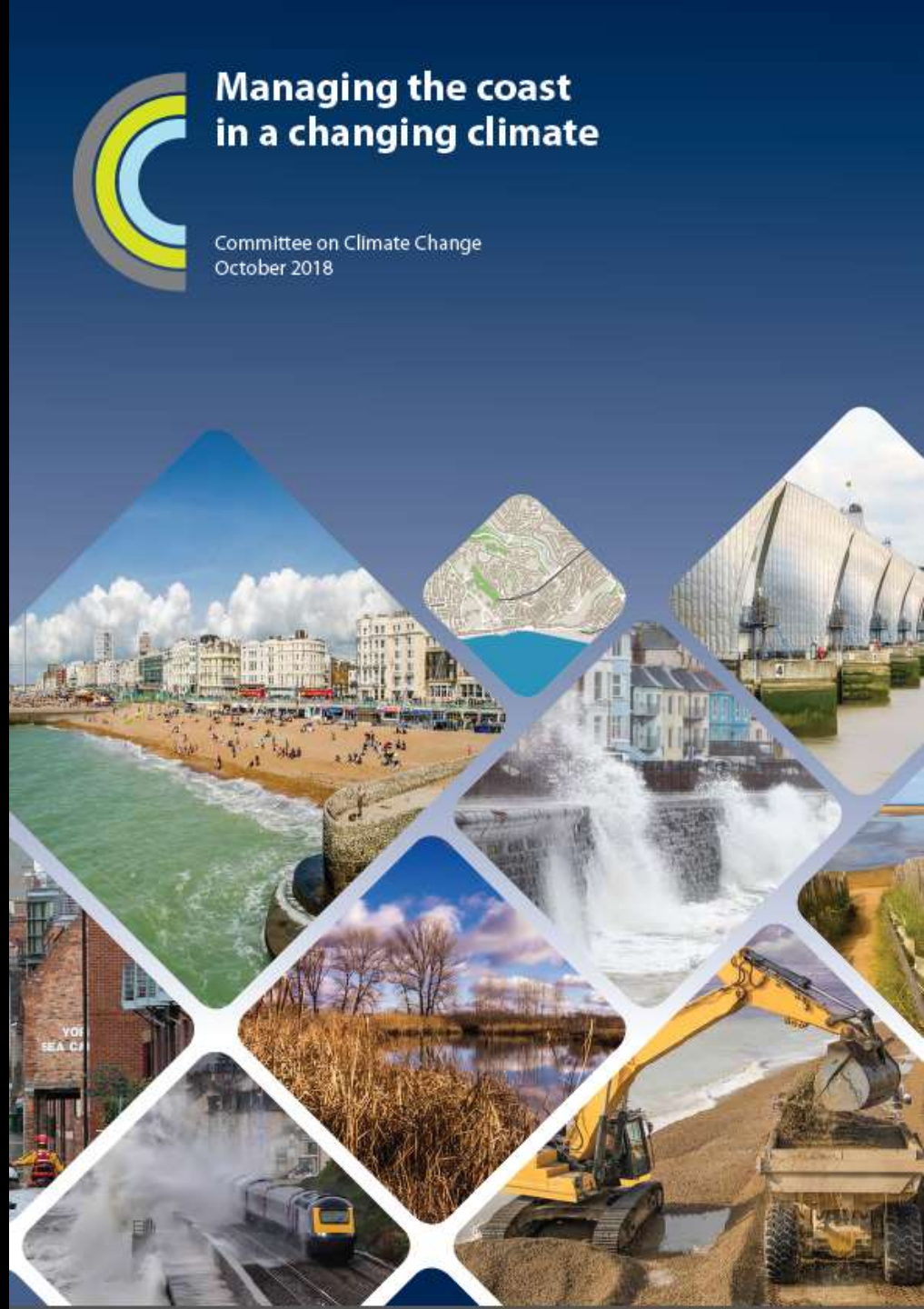
Provision to relocate development and infrastructure away from CCMA's



Committee on Climate Change

The Committee on Climate Change (the CCC) is an independent, statutory body established under the Climate Change Act 2008.

Their purpose is to advise the UK Government and Devolved Administrations on emissions targets and report to Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change.

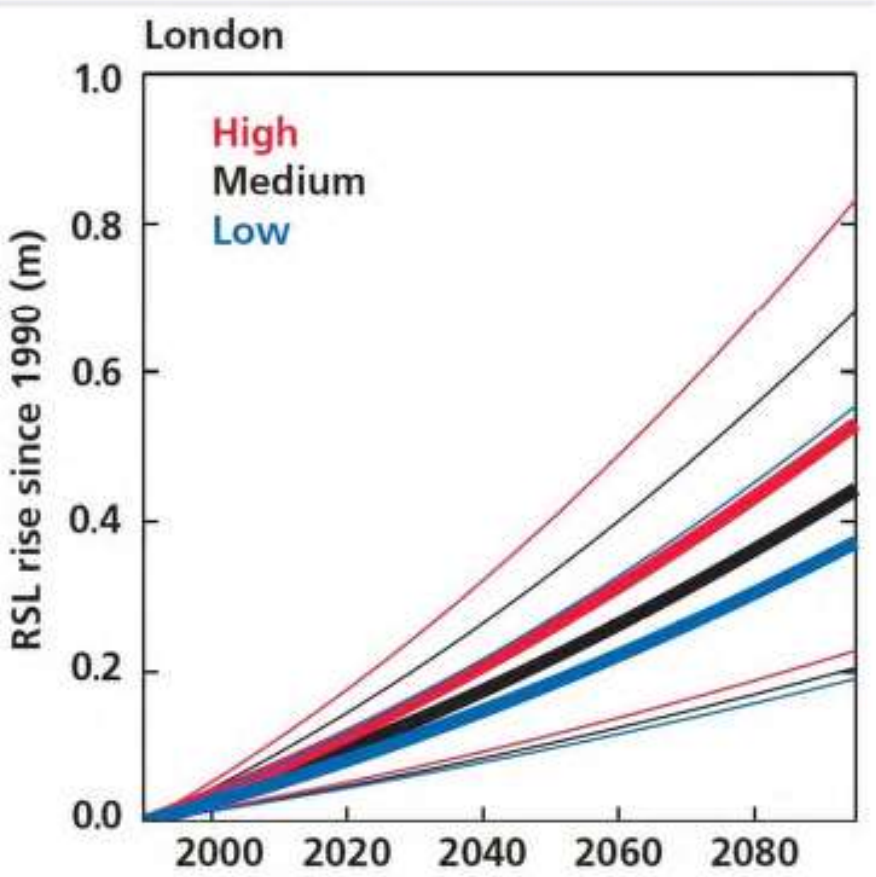


Climate change will exacerbate the already significant exposure of the English coast to flooding and erosion. The current approach to coastal management in England is unsustainable in the face of climate change:

- Coastal communities, infrastructure and landscapes already face threats from flooding and coastal erosion. These threats will increase in the future.
- In the future, some coastal communities and infrastructure are likely to be unviable in their current form. This problem is not being confronted with the required urgency or openness.
- Sustainable coastal adaptation is possible and could deliver multiple benefits. However, it requires a long term commitment and proactive steps to inform and facilitate change in social attitudes.

Committee on Climate Change

Figure 2.2. Projections of sea level rise for London, which are similar to the England average.

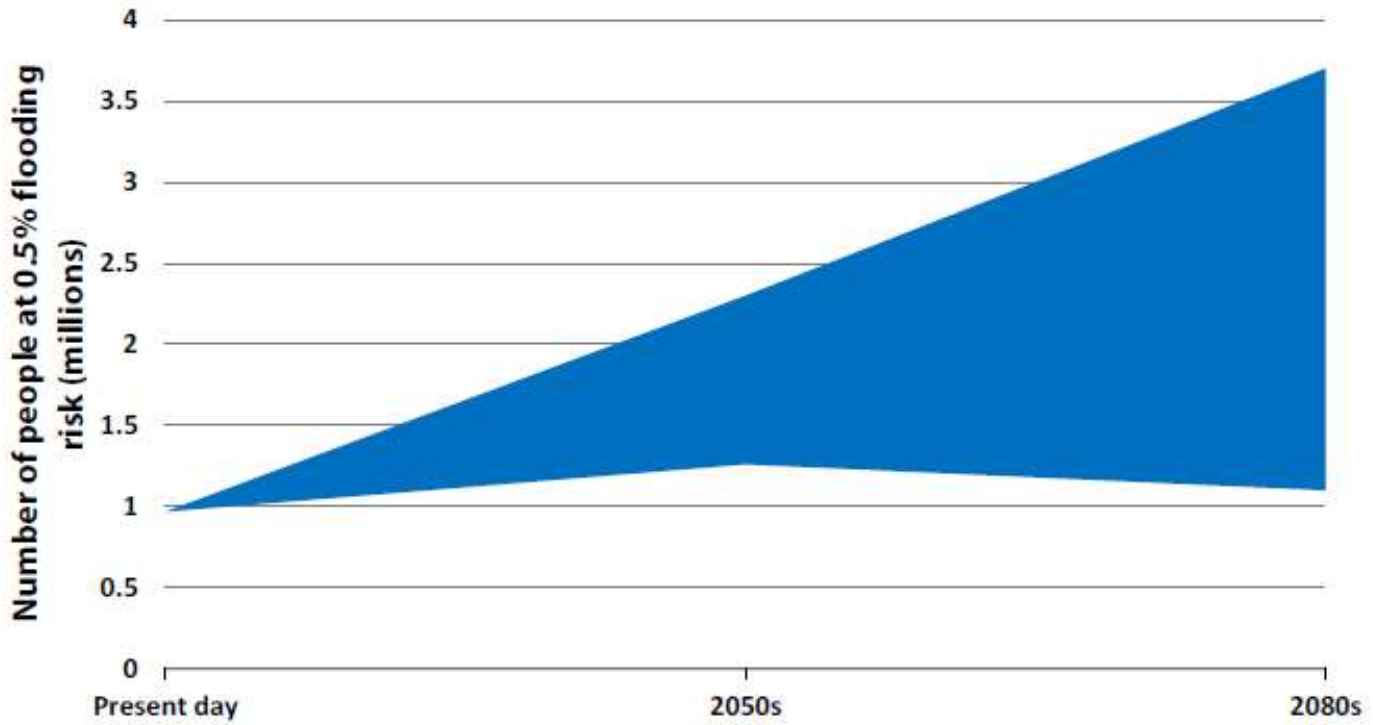


Source: Lowe et al. (2009), *UK Climate Projections science report: Marine and coastal projections.* Met Office Hadley Centre, Exeter, UK.

Notes: The thick line shows the mean and thin lines the 5th and 95th percentiles. At the time of writing (mid-2018) UKCP09 is the most up to date sea level dataset specifically for the UK. This will be updated in November 2018 with the publication of UKCP18 but those data were not available to include in this report.

Committee on Climate Change

Figure 2.5. Future population at 0.5% or greater risk of coastal flooding in England in any given year



Source: Sayers et al. (2015) *Climate Change Risk Assessment 2017: Projections of future flood risk in the UK.*
Notes: The range plotted here represents the maximum and minimum projections of the number of people at 0.5% or greater risk in any given year of future coastal flooding in the 2050s and 2080s. The full research project produced a suite of projections for different combinations of climate change, population growth and adaptation scenarios but the lower range here is from the 2°C, low population growth and enhanced adaptation measures scenario whereas the higher range is from the 4°C, high population growth and reduced adaptation measures scenario. The results of the other scenarios fall within the range shown here, including the examples used in Box 2.2.

Source: Sayers et al. (2015) *Climate Change Risk Assessment 2017: Projections of future flood risk in the UK.*

Key Messages

- It is almost certain that England will have to adapt to at least 1m of sea level rise at some point in the future.
- In England, 520,000 properties (including 370,000 homes) are located in areas with a 0.5% or greater annual risk from coastal flooding and 8,900 properties are located in areas at risk from coastal erosion, not taking into account coastal defences.
- By the 2080s, up to 1.5 million properties (including 1.2 million homes) may be in areas with a 0.5% of greater annual level of flood risk and over 100,000 properties may be at risk from coastal erosion.
- The public do not have clear and accurate information about the coastal erosion risk to which they are exposed, nor how it will change in future.
- Today, coastal management is covered by a complex patchwork of legislation and is carried out by a variety of organisations with different responsibilities.
- The current policy decisions on the long-term future of England's coastline cannot be relied upon as they are non-statutory plans containing unfunded proposals.
- We calculate that implementing the current Shoreline Management Plans to protect the coast would cost £18 - 30 billion, depending on the rate of climate change.

Slapton – gravel barrier beach between sea and freshwater habitat

NNR / SSSI designated - Carries A379 (Dartmouth to Torcross)

Does not directly defend houses – the lead criteria for FCRM funding

250m damaged in Jan 2001

Alternate road route 7km / 25km for heavy vehicles – whilst road re-built

High profile local engagement project to develop adaptive strategy

However – March 2018 Storm Emma 400m damaged

8mth diversion whilst road rebuilt and reopened

‘The re-built road will, however, almost certainly be washed away again in the future’

Demonstrates understandable societal / political pressures for short term fix

The re-built road will, however, almost certainly be washed away again in the future. This questions the wisdom of the new investment and the decision making process related to 'responsive' investments. If a long-term and objective decision making process had been applied it is unlikely that this same decision would have been made as the cost-benefit relationship for re-building in the current location is marginal at best.

This case highlights that even when significant time and money has been invested in engaging the local community and developing a forward-looking, adaptive strategy, it is still difficult to implement plans that have taken long-term issues into account. Such plans can be overlooked and a reactive and potentially unsustainable solution can be implemented instead, particularly where authorities are under pressure to respond rapidly to events.

Source: Photograph included with kind permission from Ian Coomber (2018).
Notes: Slapton Sands Beach Management Plan (2018) available at http://www.slaptonline.org/news/news.php?id=145; news stories from: https://www.devonlive.com; Devon County Council: https://new.devon.gov.uk/roadsandtransport/traffic-information/roadworks/a379-slapton-line-realignment/ and communication with other local stakeholders.

GIS based assessment of coastal risks – Summary results

Sayers and Partners LLP – part of evidence for Committee on Climate Change

‘The analysis indicates that approximately 1,400km of England's coastline will not be economically viable to manage as proposed through the SMPs based on the number of properties being protected alone (defined here as achieving a Benefit Cost Ratio – BCR - of less than 2). ‘

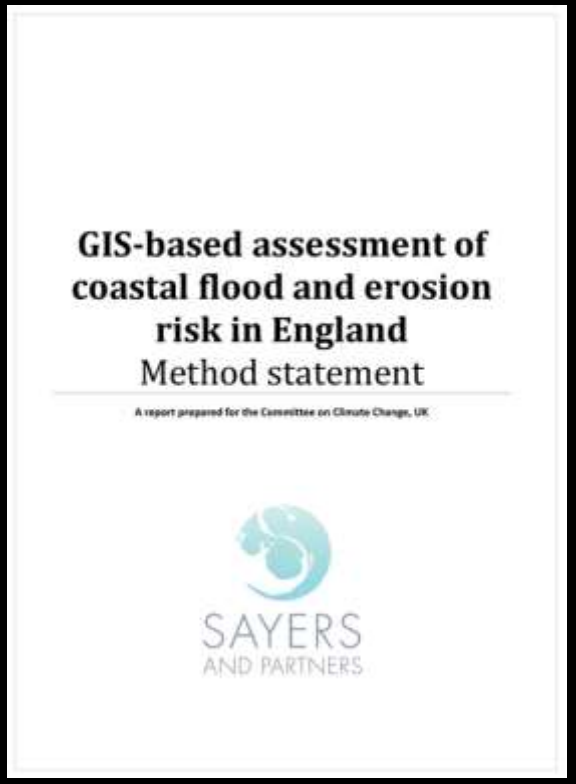
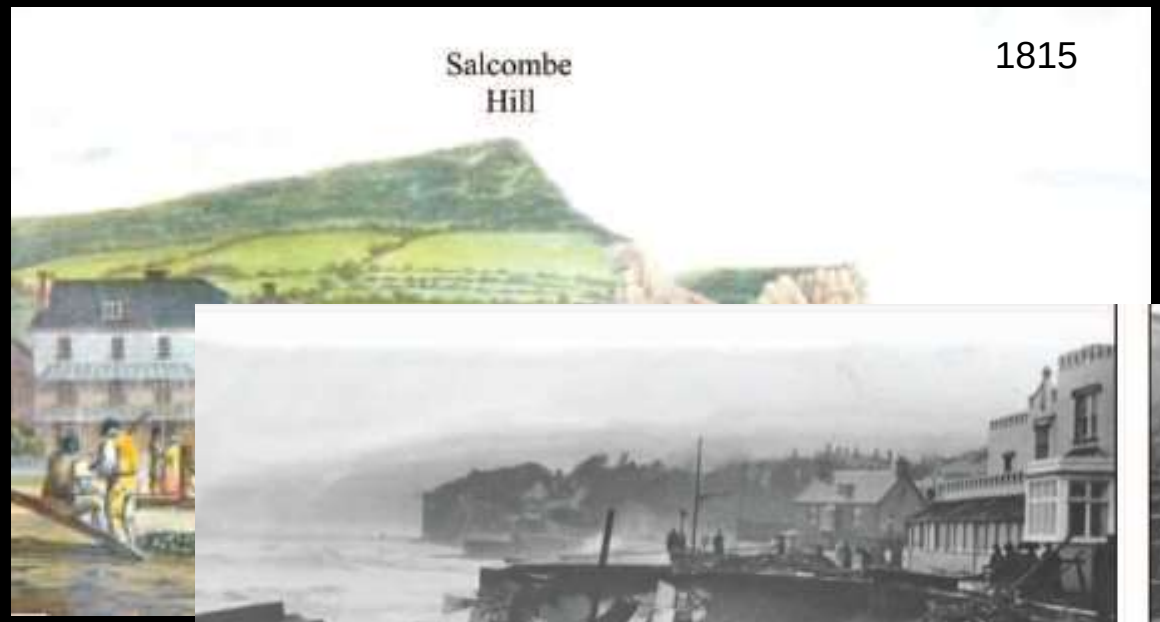


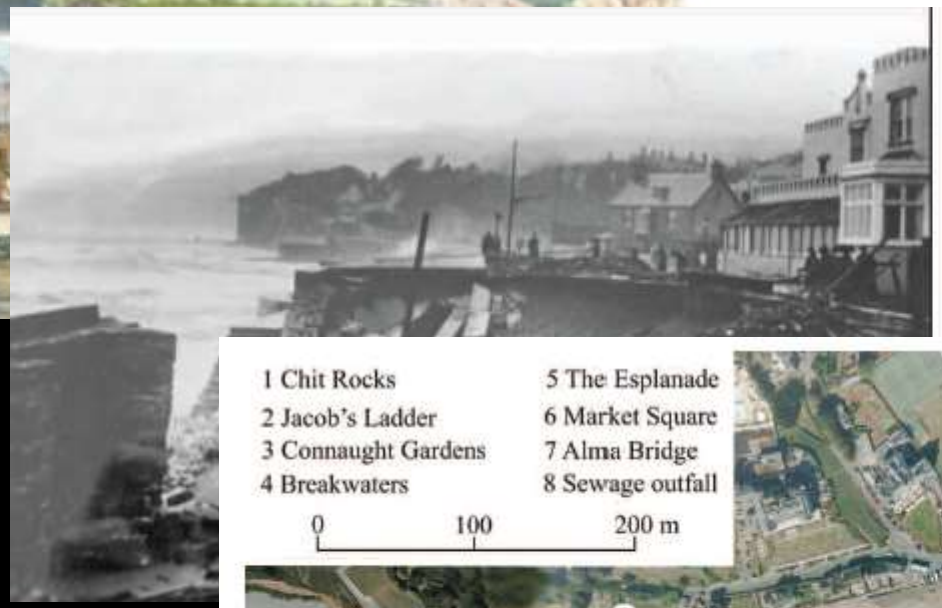
Table 1 Summary of SMP policies, costs and benefits

	Length of coastline with a given policy choice (km) (Absoute vlaue - Epoch 1; Change values - epochs 2 and 3)												Cost SMP Policy (PVc)	Erosion Avoided erosion losses (PVbe) All properties	Coastal flooding Avoided flood losses (PVbf) All Properties	Benefits Total (PVb) All Properties	Net Present Value All Properties
	NAI			MR			HLT			ATL							
	Epoch 1	Change in Epoch 2	Change in Epoch 3	Epoch 1	Change in Epoch 2	Change in Epoch 3	Epoch 1	Change in Epoch 2	Change in Epoch 3	Epoch 1	Change in Epoch 2	Change in Epoch 3	£ 000's	£ 000's	£ 000's	£ 000's	£ 000's
SMP	1,534	32	54	415	200	21	2,636	-430	-141	11	0	0	7,277,731	3,899,612	9,432,486	13,332,098	6,054,367
01 - Scottish Border to River Tyne	79	-2	-2	37	0	15	64	3	-13	0	0	0	46,713	46,490	20,052	66,542	19,829
02 - The Tyne to Flamborough Head	127	0	4	11	2	0	59	-2	-4	0	0	0	252,935	124,092	145,361	269,453	16,518
03 - Flamborough Head to Gibraltar Point	70	0	0	7	-7	0	125	0	-38	0	0	0	932,408	120,498	687,200	807,698	-124,710
04 - Gibraltar Point to Hunstanton	2	0	-2	0	0	0	103	-101	0	0	0	0	127,033	4,735	1,403,395	1,408,130	1,281,098
05 - Hunstanton to Kelling Hard	10	0	0	16	6	-4	33	-8	-8	0	0	0	81,376	11,268	105,463	116,731	35,355
06 - Kelling Hard to Lowestoft	6	18	1	27	-10	21	47	-11	-19	0	0	0	53,081	106,419	367,564	473,983	420,902
07 - Lowestoft to Felixstowe	45	3	5	22	2	5	52	-5	-10	0	0	0	307,230	387,627	93,380	481,007	173,777
08 - Essex and South Suffolk	18	0	3	38	40	-1	463	-29	-13	11	0	0	609,606	576,890	479,331	1,056,222	446,616
09 - River Medway and Swale Estuary	9	5	0	44	4	0	107	-49	0	0	0	0	434,054	6,083	418,680	424,763	-9,292
10 - Isle of Grain to South Foreland	18	0	0	4	21	2	66	-26	-2	0	0	0	330,061	44,614	872,122	916,737	586,676
11 - South Foreland to Beachy Head	15	0	0	9	0	12	85	0	-15	0	0	0	284,513	664,987	624,534	1,289,521	1,005,009
12 - Beachy Head to Selsey Bill	5	-1	0	4	1	2	35	0	-4	0	0	0	157,326	777,031	261,718	1,038,748	881,423
13 - Selsey Bill to Hurst Spit	63	-2	12	8	-1	-2	267	19	-12	0	0	0	1,382,151	191,780	445,788	637,568	-744,583
14 - Isle of Wight	113	2	1	1	1	3	44	-3	-5	0	0	0	119,681	109,527	222,819	332,346	212,665
15 - Hurst Spit to Durlston Head	53	1	-1	19	2	1	55	-3	-12	0	0	0	198,505	325,274	132,922	458,196	259,691
16 - Durlston Head to Rame Head	276	-1	0	35	7	-6	171	-14	3	0	0	0	498,105	101,948	606,686	708,634	210,529
17 - Rame Head to Hartland Point	279	0	8	22	29	-5	127	-39	-3	0	0	0	221,310	171,732	117,896	289,628	68,318
18 - Hartland Point to Anchor Head	109	6	1	8	21	-7	174	-53	4	0	0	0	291,537	41,267	628,336	669,603	378,066
19 - Anchor Head to Lavernock Point	65	0	0	37	1	4	167	-1	-4	0	0	0	72,669	139	1,040,867	1,041,006	968,337
22 - Great Ormes Head to Scotland	171	4	21	68	82	-20	393	-110	14	0	0	0	877,438	87,211	758,370	845,581	-31,857

Sidmouth



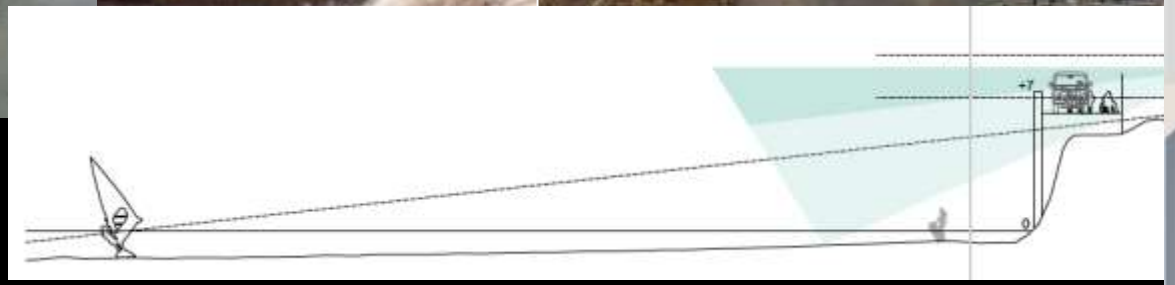
1815

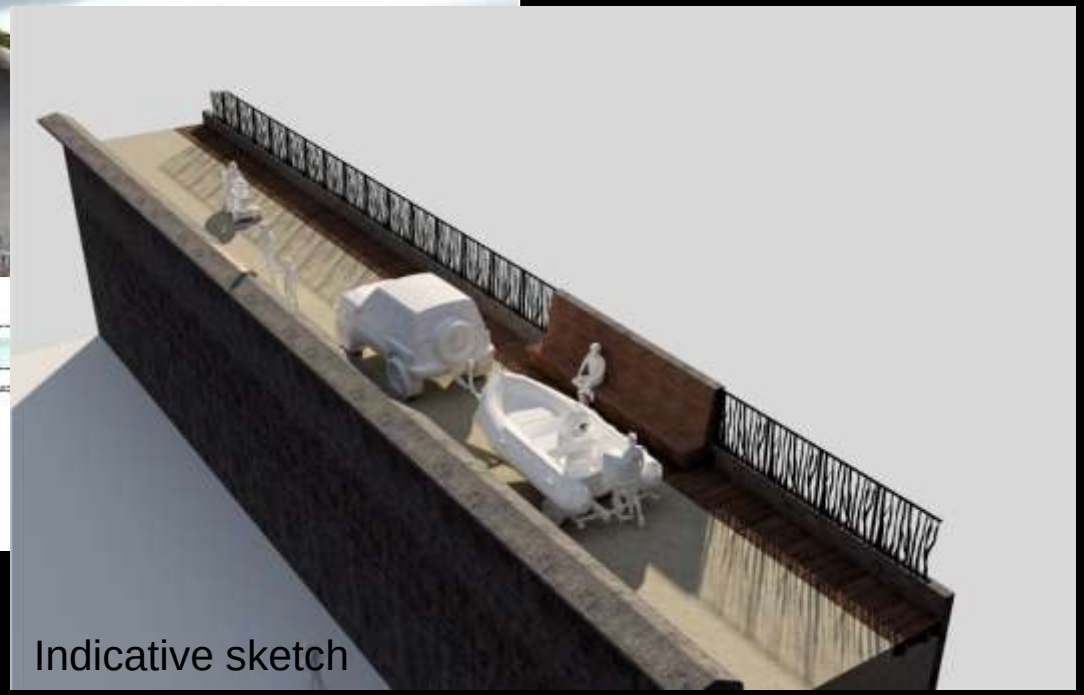


1927

Sidmouth – Pennington Point

Dawlish Seawall





Indicative sketch

Teignmouth to Holcombe – potential Advance the Line

1855

Transcend the short term

Adapt

Engage, engage, engage

Evidence

NT Shifting Shores


A new dawn - perhaps
graeme.smith@teignbridge.gov.uk