

Planning policy briefing paper

Coastal change



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Glossary of Terms

Coastal Change Management Area (CCMA)

A Coastal Change Management Area is 'An area identified in Local Plans as likely to be affected by coastal change (physical change to the shoreline through erosion, coastal landslip, permanent inundation or coastal accretion)'. Definition taken from [Planning Portal Glossary](#) CCMA.

LiDAR

Light detection and ranging (LiDAR) is an airborne remote sensing technique which uses lasers in the same way that other surveying techniques such as sonar use sound or radar uses radio waves. The Plymouth Coastal Observatory Surveys of Cliffs and Saltmarsh Systems is being flown at a 1m resolution.

National Planning Policy Framework (NPPF)

The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. (definition from paragraph 1 of [NPPF](#))

Shoreline Management Plan (SMP)

A plan providing a large-scale assessment of the risk to people and to the developed, historic and natural environment associated with coastal processes (definition taken from [Planning Portal Glossary](#) SMP).

World Heritage Site (WHS)

A cultural or natural site of outstanding universal value designated by the International Council on Monuments and Sites (ICOMOS), for example Durham Cathedral and Stonehenge. (Definition taken from [Planning Portal Glossary](#) WHS)

Summary

This briefing paper has been prepared to help the East Devon Strategic Planning Committee consider the findings of research recently undertaken by Plymouth University on coastal change and how it might affect part of the East Devon coastline.

The main purpose of the University's work has been to develop a robust and repeatable methodology for predicting coastal change that can be used by local planning authorities to define Coastal Change Management Areas (CCMA). A CCMA is usually designated through a local plan and is needed where physical changes to the coast are expected in the next 100 years. The purpose of a CCMA is to make it clear what development will be appropriate and what provision can be made to relocate development and infrastructure to less vulnerable areas – essentially it tries to ensure that development should not put more people at risk of flooding or coastal erosion.

Planning and engineering officers have been working with Plymouth University and other bodies to help develop the methodology. The East Devon Coast, from the River Sid east to the border with Dorset at Lyme Regis, has been used as a case study to test the methodology. The project is part of the South West Partnership for Environmental and Economic Prosperity (SWEET) and there has been no direct cost to EDDC for the University inputs. It is understood that there is national interest in the research and that it is likely that the methodology will be taken up by other coastal authorities when defining their CCMA's.

It is proposed that the methodology is used to predict coastal change along the remainder of the East Devon coast (from the River Sid west to the boundary with Exeter north of Exton on the Exe Estuary). The updated coastal change mapping will form part of the evidence base to support the production of the new local plan, through which consideration will be given to designating CCMA's and devising appropriate policies and proposals.

This briefing paper has been prepared by East Devon District Council officers to help provide an understanding of very complex academic research. The paper is only a summary of the work and the full papers should be consulted for comprehensive details of the work undertaken: these papers are available to view at [South West Partnership for Environment & Economic Prosperity \(SWEET\) - Plymouth Marine Laboratory](#).

1 Introduction to coastal change

- 1.1 Our coastline is constantly altered by waves, tidal currents and the changing climate. Coastal change is the term used to describe any permanent physical change to the shoreline caused by erosion, landslip, permanent inundation (flooding) or coastal accretion.
- 1.2 When sea water meets cliffs and shores, it causes sediment or rocks to be broken down and washed out to sea. This is coastal erosion. In some instances, this material may be moved to a different part of the coast and be deposited in large quantities, causing accretion - the opposite of erosion. The sand and shingle that make our beaches are products of erosion and, to remain in balance, we need a continued supply of this material. Coastal inundation occurs when an area of land is flooded by the sea (including tidal estuaries) on a permanent basis. Landslides are the movement of a mass of rock or earth down a slope under the force of gravity. They can be triggered by processes other than wave action such as heavy rainfall. A series of large landslips between Axmouth and Lyme Regis during the Eighteenth and Nineteenth Centuries created a rare and unusual habitat for plants and birds that is protected as a national nature reserve
- 1.3 It is anticipated that climate change will create increasing pressure on coastal and estuarine environments through accelerating rates of sea level rise and an increased number of storms.



2 National approach and guidance

2.1 The emphasis is on working with natural processes to adapt to coastal change rather than trying to prevent it. The National Planning Policy Framework (NPPF) seeks to reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast. Local Planning Authorities are expected to:

- work with the Marine Management Organisation to integrate terrestrial and marine planning;
- identify as Coastal Change Management Areas anywhere likely to be affected by physical changes to the coast;
- make clear what development will be appropriate in Coastal Change Management Areas and;
- make provision for development and infrastructure that needs to be relocated away from Coastal Change Management Areas.

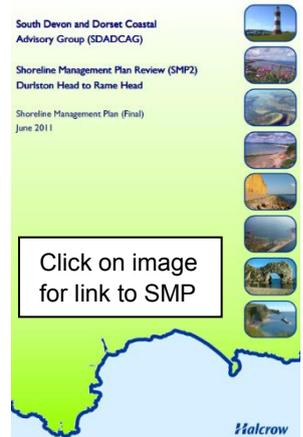
2.2 The NPPF advises local planning authorities to reduce risk from coastal change by avoiding inappropriate development in vulnerable areas and preventing development at risk from land instability; in essence, development should not be allowed to put more people at risk of flooding or coastal erosion. CCMA's should be designated when there are expected to be significant physical changes to the coastline within 100 years. The purpose of a CCMA is to identify areas where special policies and actions are likely to be needed to deal with the anticipated physical changes to the coast. These are likely to include policies to stop inappropriate development that would not be safe over its planned lifetime and to set out what kind of development may be appropriate and to enable the relocation of uses/infrastructure/buildings where possible. For example, it may not be safe to grant planning permission for a house, but it might be acceptable to allow a kiosk for the sale of ice creams and snacks. A CCMA could also identify existing infrastructure or development at risk and set out the options for its relocation to a less vulnerable area. Examples of this might include the need to find a new route for a road or an alternative site for an electricity sub-station.



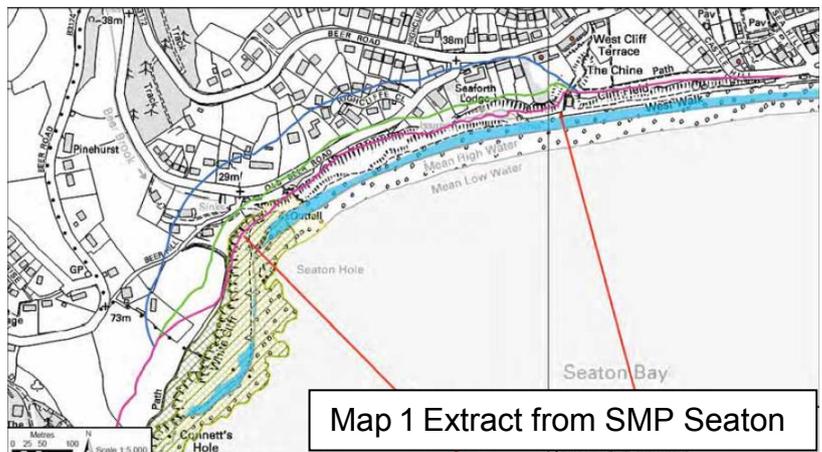
Photo 2 Kiosk at Seaton

3 Current approach in East Devon

3.1 At the time that the current local plan was developed and adopted the most up-to-date evidence on potential coastal change was the Shoreline Management Plan (SMP). The SMP is a large-scale assessment of the risks associated with coastal processes. It sets out the overall strategy for the coastline and is implemented through more detailed studies, such as beach management plans or coastal protection projects. The objectives of the SMP are to: improve understanding of coastal processes; work in partnership with all interested parties and to prepare a setting for the long term planning of coastal defences.

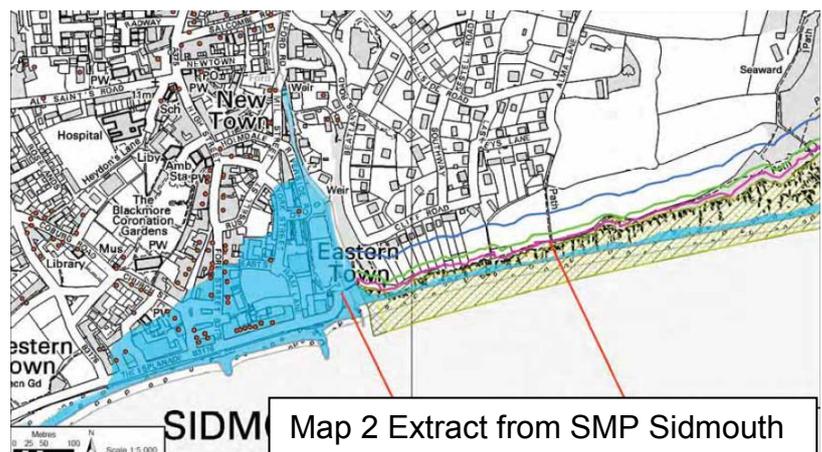


3.2 The broad approach of the SMP is to defend the centres of the main coastal settlements but to allow natural processes to continue elsewhere. It includes maps showing the expected shoreline position in 0-20 years, 20-50 years and 50-100 years. The 20 to 100 year time horizons show a small number of properties in Seaton and Sidmouth being affected by coastal change, but none in the 0-20 year epoch as indicated on Maps 1 and 2 (where the pink line indicates the 0-20 year erosion rate, the green line the 20-50 year line and the blue the 50-100 year). Details for the whole East Devon coast can be seen by clicking' on the maps (which may take some time to upload). The SMP is being refreshed to include the latest projections for climate change and sea level rise.



Map 1 Extract from SMP Seaton

From Present Day:		Medium-Term:	Long-Term:
Managed Realignment		Managed Realignment	Managed Realignment
Hold the Line	Environment Agency Flood Risk Zone 2	Environmental/Cultural Heritage	Scheduled Monuments
Predicted erosion zones with preferred policy	Special Areas of Conservation	World Heritage Site	Site of Special Scientific Interest
0-20 year	Special Protected Areas	Special Areas of Conservation	Listed Building
20-50 year	Site of Special Scientific Interest	Special Areas of Conservation	
50-100 year			
Policy Unit Boundary			



SIDM Map 2 Extract from SMP Sidmouth

From Present Day:		Medium-Term:	Long-Term:
Managed Realignment		Managed Realignment	Managed Realignment
Hold the Line	Environment Agency Flood Risk Zone 2	Environmental/Cultural Heritage	Scheduled Monuments
Predicted erosion zones with preferred policy	Special Areas of Conservation	World Heritage Site	Site of Special Scientific Interest
0-20 year	Special Protected Areas	Special Areas of Conservation	Listed Building
20-50 year	Site of Special Scientific Interest	Special Areas of Conservation	
50-100 year			
Policy Unit Boundary			

3.3 Currently the Shoreline Management Plan and any relevant beach management plans are used to guide decisions about which areas are at risk from coastal change. A Beach Management Plan (BMP) is a plan for managing a beach at a local level for the purpose of Flood and Coastal Erosion Risk Management. Consideration is given to the current condition of the beach and coastal defences, alongside their long-term future. BMPs outline the considerations and actions to be taken for the next 5 years. In East Devon there are beach management plans for Exmouth, Seaton and Sidmouth.

3.4 Strategy 45 of the East Devon Local Plan generally supports proposals for sustainable coastal change management and seeks to balance allowing coastal erosion with protecting coastal communities. It should be remembered that natural coastal erosion processes help to justify the status of the Dorset and East Devon World Heritage Coastline, and are taken into account in the local plan.

3.5 Policy EN25 of the local plan sets out criteria to guide the relocation of some forms of development if they are likely to be affected by coastal erosion in the short term (20 years). Policy EN25 was intended to be an interim policy, paragraph 22.37 of the local plan noting that 'although the Shoreline Management Plan does not identify significant coastal change within the lifetime of the plan, in the future it will be appropriate to define specific coastal change management areas...extensive engagement with local communities and expert bodies will be needed to support this work, which will be used to inform a future review of the plan'.



4 The need for new evidence on coastal change

- 4.1 The National Planning Practice Guidance advises local planning authorities that shoreline management plans (SMP) should provide the primary source of evidence in defining a coastal change management area. However, SMP's were prepared on a regional scale and do not include the detailed work that is sometimes necessary to fully understand and predict complex coastal systems like the East Devon coast. The development of systematic regional monitoring programs around the coastline, combined with improvements in mapping and imaging technology (for example, aerial imagery, terrestrial and aerial LiDAR), have enabled contemporary coastal change to be more accurately measured.
- 4.2 Although CCMA's were first suggested by Central Government in 2010, very few have been designated nationally and these are very varied in scope. This may be because there is limited guidance on how they should be defined and no consistent methodology for identifying areas at risk at a detailed level, rather than the broad brush approach of the SMP's. Although the SMP is a useful starting point, currently it does not incorporate future climate change impacts and the part that covers the East Devon coast was adopted in 2011, so the mapping within it is now dated. All SMP's are currently being reviewed. The designation of a CCMA has significant implications for the people who live, work and own property in the areas affected so it is important to have the most accurate and robust evidence possible on which areas are at risk and within what timescale.
- 4.3 There are several public bodies with a particular interest in obtaining accurate predictions of coastal change including the Environment Agency, Natural England and the Marine Management Organisation. This is a complex process involving multiple data sources, agencies and expert judgement. Nationally, few local planning authorities (LPAs) have felt confident to undertake this task, citing a lack of reliable or consistent methodology to establish such designations. As such, development continues in often active coastal zones, with little regard for future shoreline shifts. The establishment of a robust methodology to anticipate coastal change at a local level is therefore seen as a vitally important step to guide the designation of CCMA's.



Photo 4 Beach and cliffs at Beer

5 How the new coastal change maps have been produced

5.1 The Coastal Processes Research Group in the School of Biological and Marine Sciences, University of Plymouth have the academic expertise to develop a robust methodology to predict likely rates of coastal change. They have led on the production of a methodology and have published three research papers on the topic, which are available at [South West Partnership for Environment & Economic Prosperity \(SWEEP\) - Plymouth Marine Laboratory](#). The first paper is a review of CCMA's, the second considers a CCMA methodology and the third considers draft areas for CCMA designation in the two study areas (part of the East Devon coast and the Taw Torridge Estuary). The work has been undertaken in association with the Environment Agency, Natural England, the Marine Management Organisation, East Devon, North Devon and Torridge Councils.



Photo 5 Plymouth University undertaking field work

5.2 The research work has been funded by the South West Partnership for Environment and Economic Prosperity (SWEEP), which is a partnership project with the aim of delivering economic and community benefits to the South West, whilst protecting and enhancing the area's natural resources. It is a collaboration of three research institutions: the University of Exeter, Plymouth Marine Laboratory and the University of Plymouth.

5.3 The University of Plymouth have devised a methodology for predicting the extent of coastal change related to the different types of coast involved (estuary, cliff or beach). The approach is to use the most widely adopted predictive equations which have been peer-reviewed. These are then applied to the available datasets and explored further within a Geographical Information Systems (GIS) to allow greater spatial analysis. The sections of East Devon coast used to test the methodology are mainly cliffs but also include the Axe Estuary.

- 5.4 For eroding cliff systems, past retreat rates and the associated historic rates of sea-level rise provide key indicators for future behaviour. By combining past retreat rates with predicted future sea level rise, it is possible to estimate future cliff line positions using predictive formulae from the scientific literature. The improved detail provided by LiDAR analysis, compared with historic mapping, allows for variable along-coast retreat rates to be calculated, reflecting the fact that cliff retreat rates vary within a given area. The approach firstly quantifies rates of historic cliff retreat using geomorphic change detected from airborne LiDAR, and secondly, applies formulae for future cliff retreat that considers the effects of accelerating sea level rise.
- 5.5 Sea level rise projections into the future are available for the UK from the United Kingdom Climate Projections dataset (currently UKCP18), and the 'high emissions, 50th percentile' climate scenario was used. This is in line with Environment Agency common practice and represents a precautionary approach. Cliff retreat is episodic and spatially variable so future retreat rates for any given area are best informed by considering the maximum historic retreat along the surrounding cliff area. This is a more robust approach than considering retreat at each location in isolation, provided the neighbouring cliff is of a similar geomorphological type, and the cliff has a similar wave exposure. Dividing the coastline into sections also allows a transition between the differing methods required to project cliff retreat and beach retreat, as different retreat rate equations need to be applied for each case. To inform where the coastline is divided into differing sections, the Coastal Vulnerability Dataset from the British Geological Survey (BGS) was used. This dataset has been compiled by geologists (engineering and coastal) and the BGS to provide a range of GIS layers that identify areas susceptible to flooding and coastal erosion for Great Britain within 1 km of the coast. To calculate the past rate of cliff retreat the difference in cliff volume (the 'geomorphic change') between different LiDAR epochs was used. For each profile along the cliff-top, volumetric analysis was undertaken on a section of the extracted profile. The computed volumes were then used to calculate past retreat rates for each of the extracted profiles.
- 5.6 The new lines provide additional evidence that can be considered alongside the SMP when planning for areas at risk of coastal change. The new lines are derived from more precise and accurate data, using the most up to date sea level rise projections, and the best available cliff retreat formulae. They produce estimates of future coastal retreat that are data-driven and vary along the coast to reflect differences in geology and observed retreat. While the SMP coastal retreat predictions are very similar in some areas, they do not vary much over large sections of coastline, despite large differences in the observed rates of past retreat. This is



because the SMP uses a coarser resolution baseline map and applies uniform retreat distances to sections of the coast. For the new approach the predicted rate of future cliff retreat is dependent on the historic retreat rate at each location (up to every 10 m because of the LiDAR data resolution), and therefore varies along the coast. It is expected that the existing SMP underestimates future retreat in some places, while overestimating it in other places, both of which would be problematic when designating a CCMA.

5.7 Whilst most of the study area in East Devon covered cliffs, the Axe Estuary was also assessed. In an estuarine environment the most likely coastal change is increased flooding of the surrounding land and possible permanent inundation. The University assessed this through an approach which considers the impact of sea-level rise on the areas already identified as being at risk of flooding by the Environment Agency.

5.8 For estuaries, the prediction of coastal change is linked directly to inundation from projected rises in sea level. The latest data from the National Coastal Erosion Risk Mapping (NCERM) and the Environment Agency's flood zone maps were combined, with the inland boundary used on a precautionary basis where they differed. By combining these data, any gaps and inconsistencies in their spatial extents were identified enabling additional analysis to be focused in these areas.

5.9 On the GIS, airborne LiDAR tiles covering the estuary were merged into one layer, with preliminary processing enabling removal of vegetation cover to create a real ground level without distortion from trees, hedges and ground cover. Current extreme sea level values for the highest astronomical tides for different return periods (such as 1 in 200 year event) were taken from the Environment Agency's coastal design sea-level data set. This was used to generate a flood zone map which equates to a future flood zone 3 (1:200 year return level). This approach relies on the most recent aerial LiDAR to mapping from which the projected elevation can be extracted to create the inundation map. A vertical 0.25 m buffer was added to the projected extent of sea level rise on a precautionary basis. This generates a horizontal buffer around the potential CCMA, the extent of which depends on the gradients around the estuary. Where the coastal path follows the line of an estuary, the horizontal buffer needs to be at least 2 metres wide to accommodate any future relocation of the South West Coast Path.



Photo 7 Axe Estuary from Seaton Bridge

6 Next Steps

- 6.1 The new research is mainly aimed at providing a sound basis to identify which areas are likely to be subject to coastal change in the next 100 years so that appropriate plans and policies can be put into place. This will happen through the review of the East Devon Local Plan, which will need to consider identifying Coastal Change Management Areas. It is also hoped that the research will be useful in informing projects for coastal adaptation, in particular in implementing the beach management plans.
- 6.2 As a local planning authority we will focus on defining and developing the right policies to guide development in coastal change management areas through the new local plan. The work undertaken by Plymouth University will form part of the background evidence that informs the new local plan. Coastal change management areas are likely to have policies that restrict what development can happen, but we also hope to be able to plan positively for the affected areas, including seeking opportunities for environmental gain through habitat creation (such as space for salt marshes on estuarine margins). We will also need to consider introducing policies that enable the relocation of uses and buildings to less vulnerable locations where planning permission would not otherwise be granted.
- 6.3 The biggest changes in the coastline predicted by the new research when compared with the Shoreline Management Plan occur through cliff falls. There is an important difference between areas at risk of physically falling into the sea through cliff erosion and areas that may suffer increased risks of flooding, such as land surrounding the Axe Estuary. An increase in flood events is likely to lead to areas only gradually becoming unsuitable for people to live and work in as the risks of flood events rise, but cliff erosion constitutes a potentially catastrophic risk. This is likely to require a difference in approach to the planning policies that may be appropriate according to the nature of the risk posed. It is also the case that most of our town centres will be more susceptible to gradual change as is shown in the Axe Estuary, where large parts of the town are included in the area shown to be at risk of flooding.
- 6.4 Predicting future coastal change is a complex science and is subject to many variables, including any interventions in the form of coastal protection works and the variability in climate projections. The work undertaken by Plymouth University is ground breaking research that is likely to stimulate a national debate on how best to identify areas susceptible to coastal change. That does not mean that the changes identified will definitely happen within the specified timescales, partly because predicting the future accurately is difficult but also because there are interventions that can be taken to alter coastal change. Whilst the national approach is to 'let nature take its course', it is sometimes appropriate to seek to reduce erosion rates.
- 6.5 Our work as a coastal protection authority will prioritise the delivery of beach management plans and the development of coastal protection works that accord with the beach management plans. This includes the provision of rock groynes at Sidmouth that are designed to reduce the rate of cliff erosion as shown in Figure 1. In

Seaton our beach management plan aims to reduce the risk of erosion to properties and infrastructure to the West of the town between Seaton Hole and West Walk by improving the existing revetments, and constructing a new defence between the existing rock revetment and West Walk

Figure 1 Extract from Sidmouth Beach Management Plan



The Preferred Option

The preferred option considered the various risks and pressures facing the different parts of the coastal frontage, such as overtopping, outflanking, erosion and sediment loss as well as aspects such as affordability, buildability and impact on the environment.

The preferred option for each frontage was agreed as the following:

- Frontage A: Maintain Chit Rocks Revetment and clear promenade
- Frontage B: Renourish the shingle beach and provide protective wall
- Frontage C: Restoration and maintenance to the River Sid flood wall and repairs to the Training Wall
- Frontage D: Build Rock groynes and beach to reduce cliff erosion

This is considered to be the most suitable option given the requirements to balance the technical implementation, environmental acceptability and the economic case. Other options assessed did not meet the overall need of the scheme.

7 Areas affected

7.1 In terms of cliff erosion, the new maps show more variation than the Shoreline Management Plan in the extent of areas potentially affected by coastal change. This means that some areas that are not shown to be affected in the SMP are now included in the area at risk and some of the areas shown to be at risk in the SMP are not included in the new mapping. It is important to note that the new maps include a ten metre 'buffer' inland of the predicted coastal change and all references to places refer to the land within this buffer.

7.2 Areas that are predicted to experience less erosion than the SMP maps include:

- The section of coast from Seaton to Lyme Regis.
- Much of the coast west of Highcliffe close in Seaton, through Beer to the east of Branscombe mouth; and
- The majority of the coast from Branscombe mouth to the cliffs east of Sidmouth (roughly south of 'Southdown').

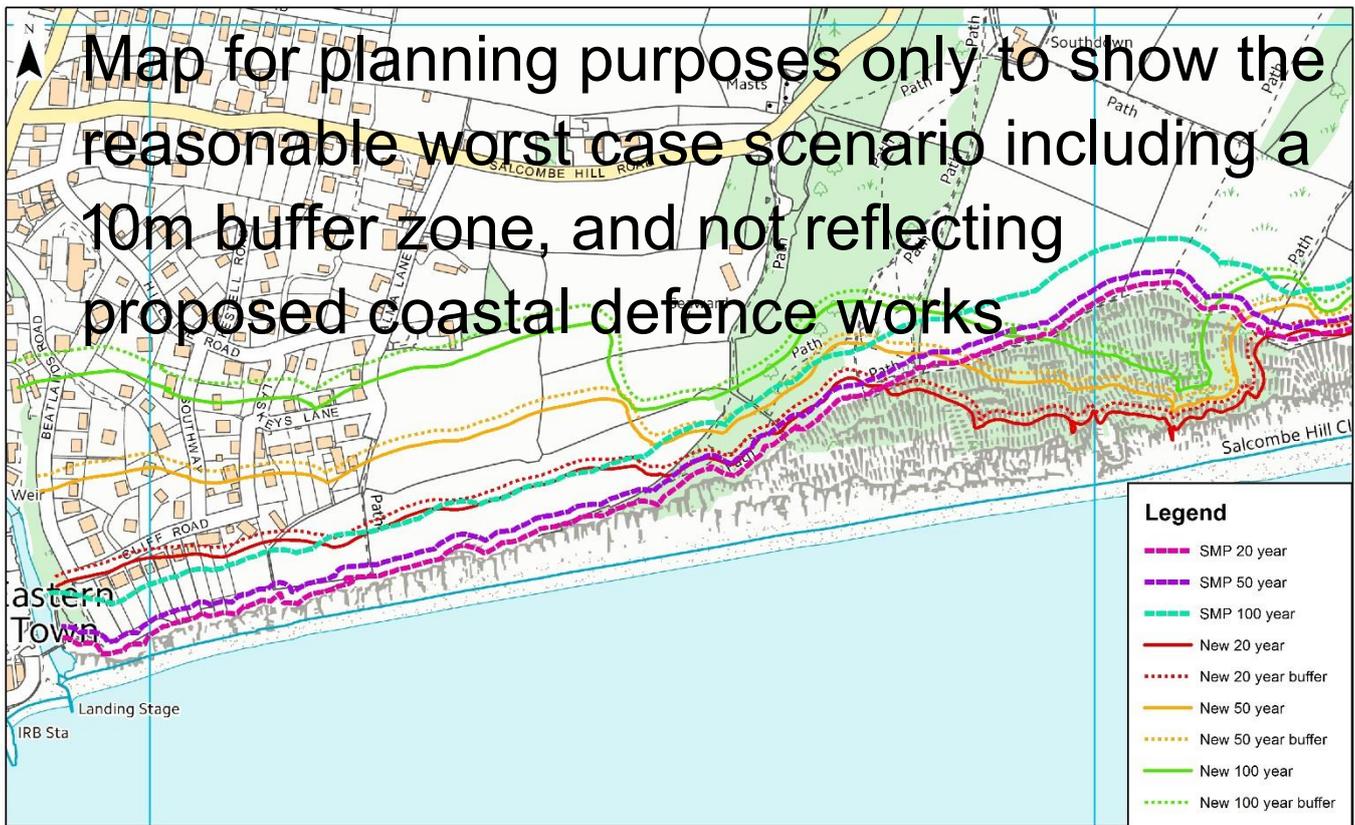
7.3 Areas where more erosion is predicted in the new maps compared to the SMP are:

- In Seaton including some properties accessed off Beer Road and the Highcliffs Close area;
- Two small areas either side of Branscombe mouth; and
- Land in Sidmouth east of the River Sid including many properties accessed off Cliff Road, Beatlands Road, Southway, Laskeys Lane and Alma Road.

7.4 Maps are include in Appendix 1. For cliffs these show the existing Shoreline Management Plan (SMP) lines as well as the new Plymouth University lines.

APPENDIX 1 Maps

Map 1 River Sid to Salcombe Hill Cliff

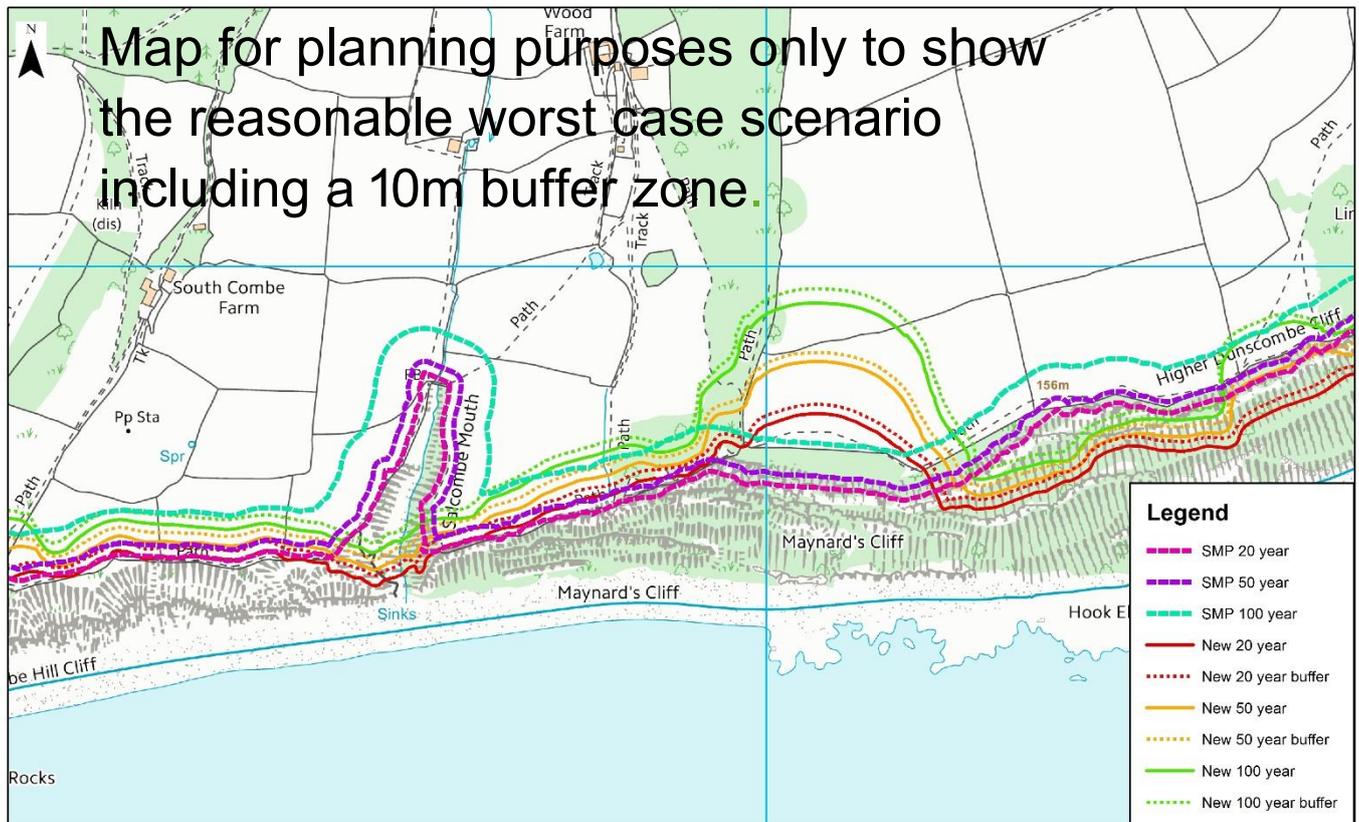


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Key points

- The SMP lines are the stippled pink, purple and green lines that are closest to the coast near to the River Sid
- The new erosion lines are the solid red, orange and green lines with the related buffer being indicated in stippled lines of the same colour
- In the area of housing to the immediate east of the River Sid, the new erosion lines show significantly faster and further erosion than indicated in the SMP
- For the housing to the south of Cliff Road, the new 20 year erosion line extends further inland than the 100 year SMP line
- The new erosion rates do not take account of the coastal protection works proposed as part of the beach management plan; these are designed to reduce the rate of erosion

Map 2 Salcombe High Cliff to Higher Dunscombe Cliffe

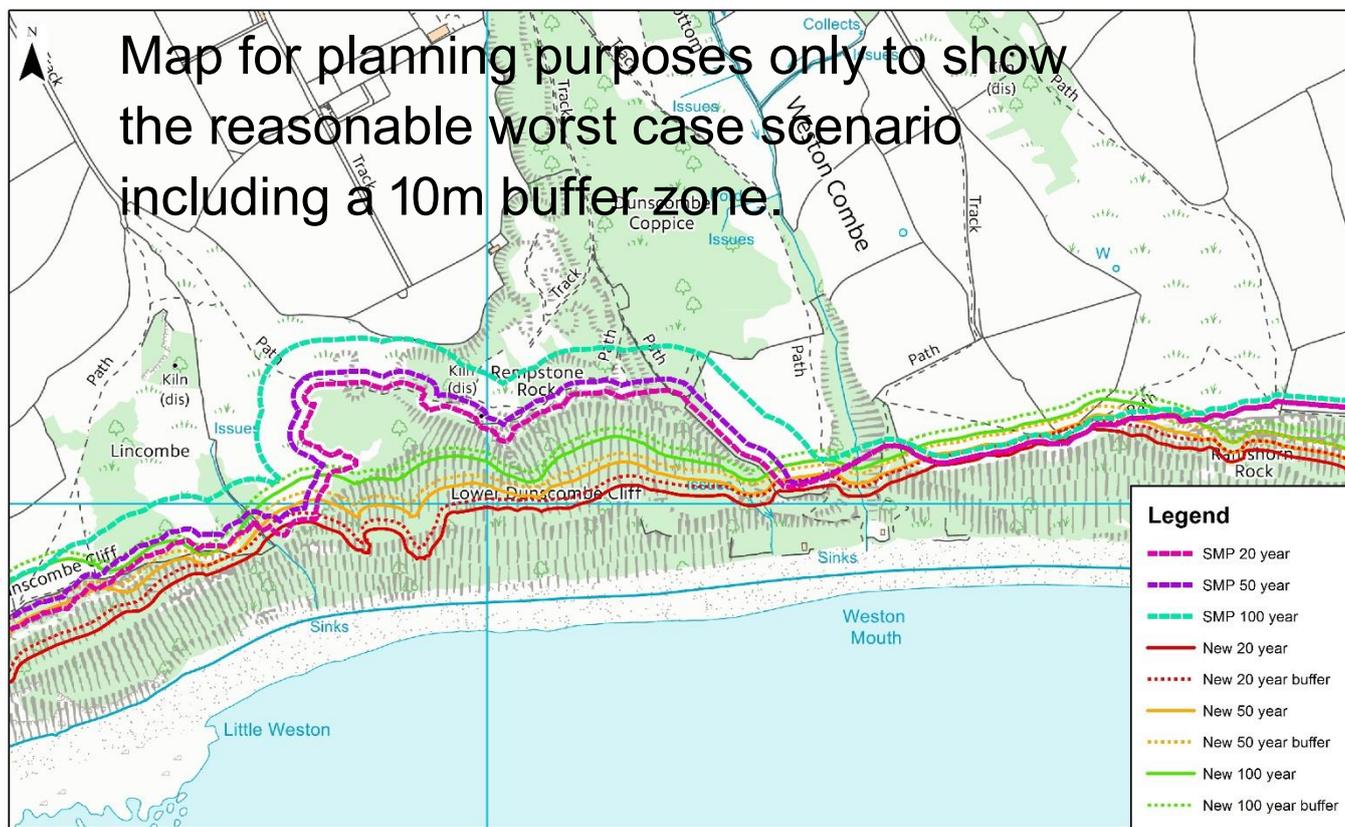


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Key points

- Around Salcomen Mouth the new erosion lines show far less erosion than the SMP
- At Maynard's cliff the new erosion lines show significantly more erosion than the SMP
- At part of Higher Dunscombe Cliff the new 20 year erosion line shows less erosion than the 20 year SMP line, but similar levels in the 50 and 100 year lines

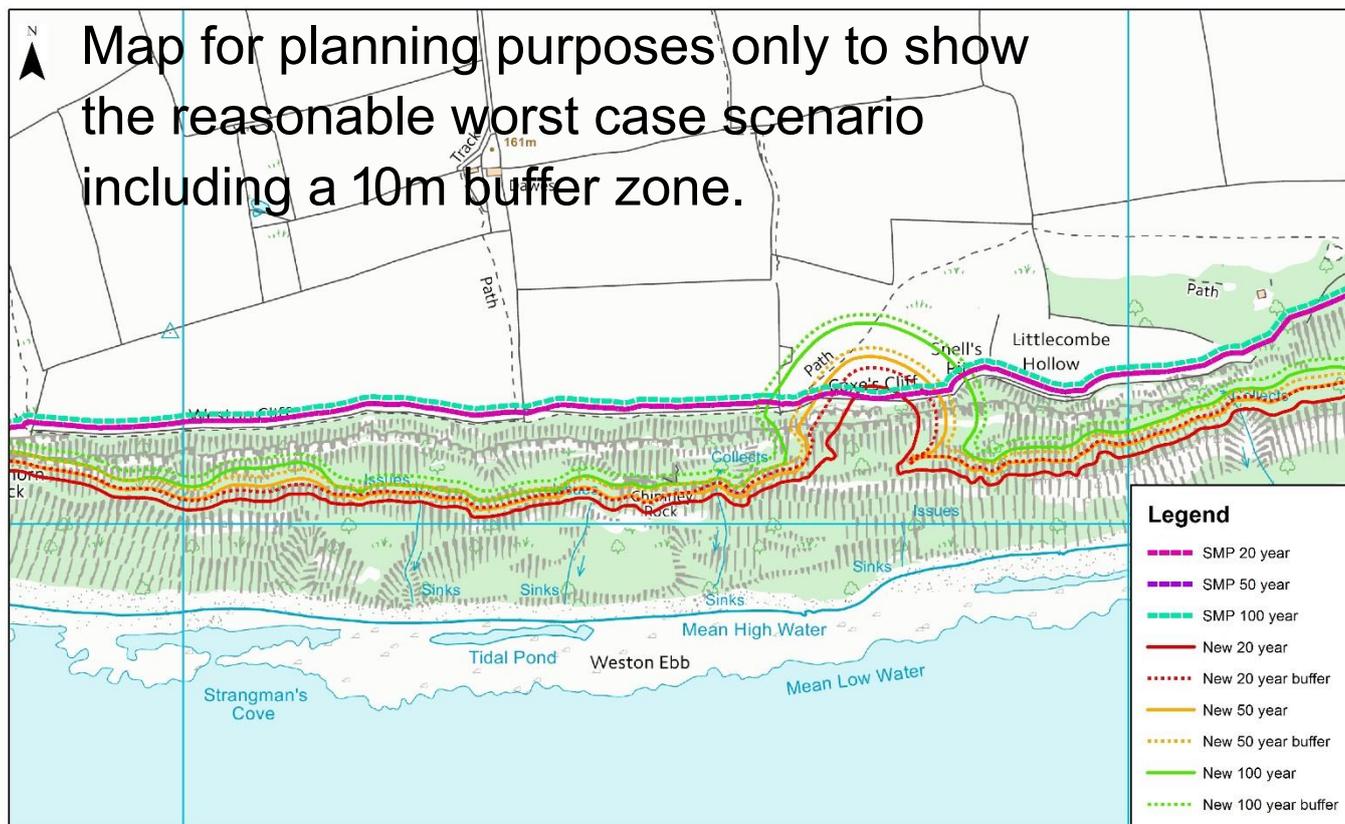
Map 3 Little Weston, Lower Dunscombe Cliff and Western Mouth



Key points

- At Lower Dunscombe Cliff, the new erosion lines show significantly less erosion than the SMP

Map 4 Western Ebb

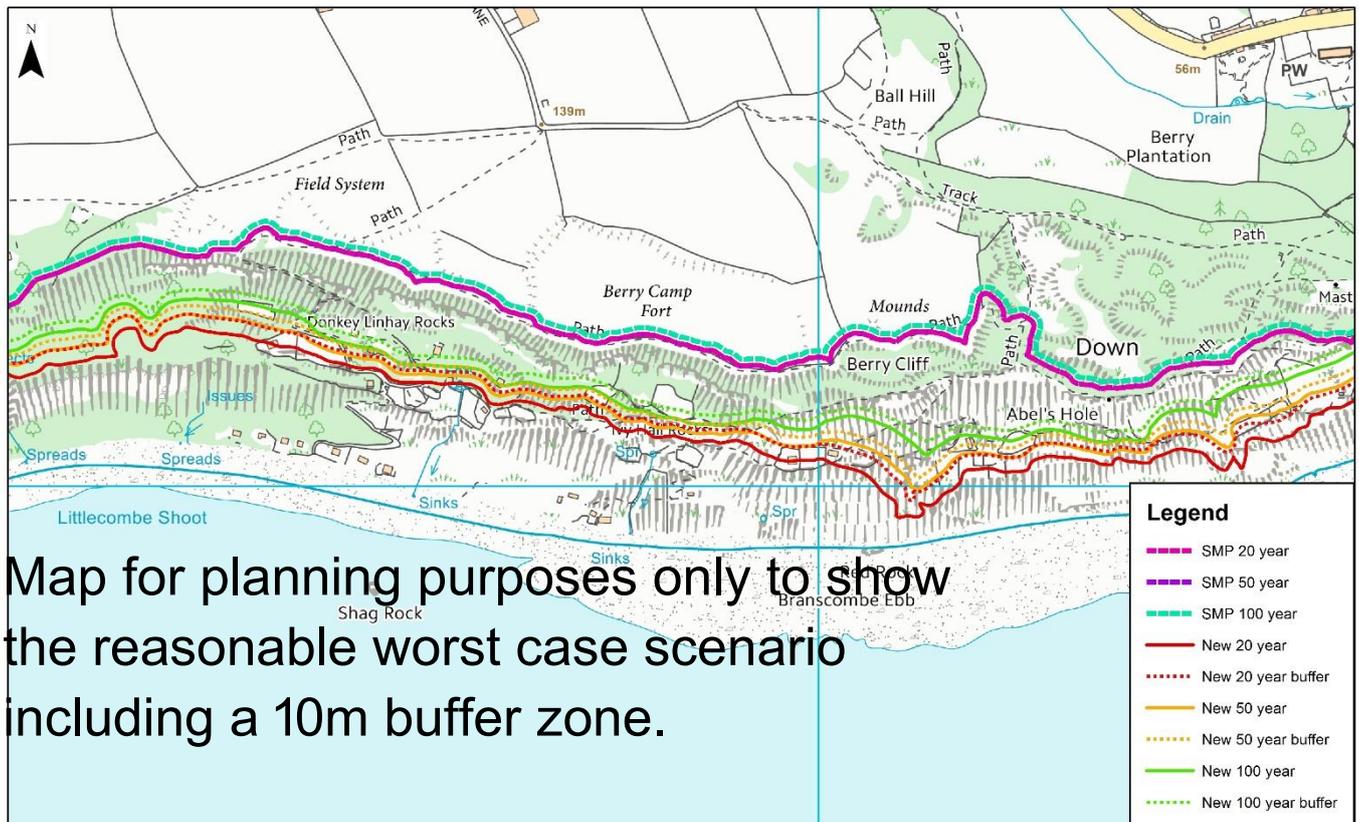


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Key points

- In this area the new erosion lines generally show less erosion than the SMP, except at Coxe's Cliff

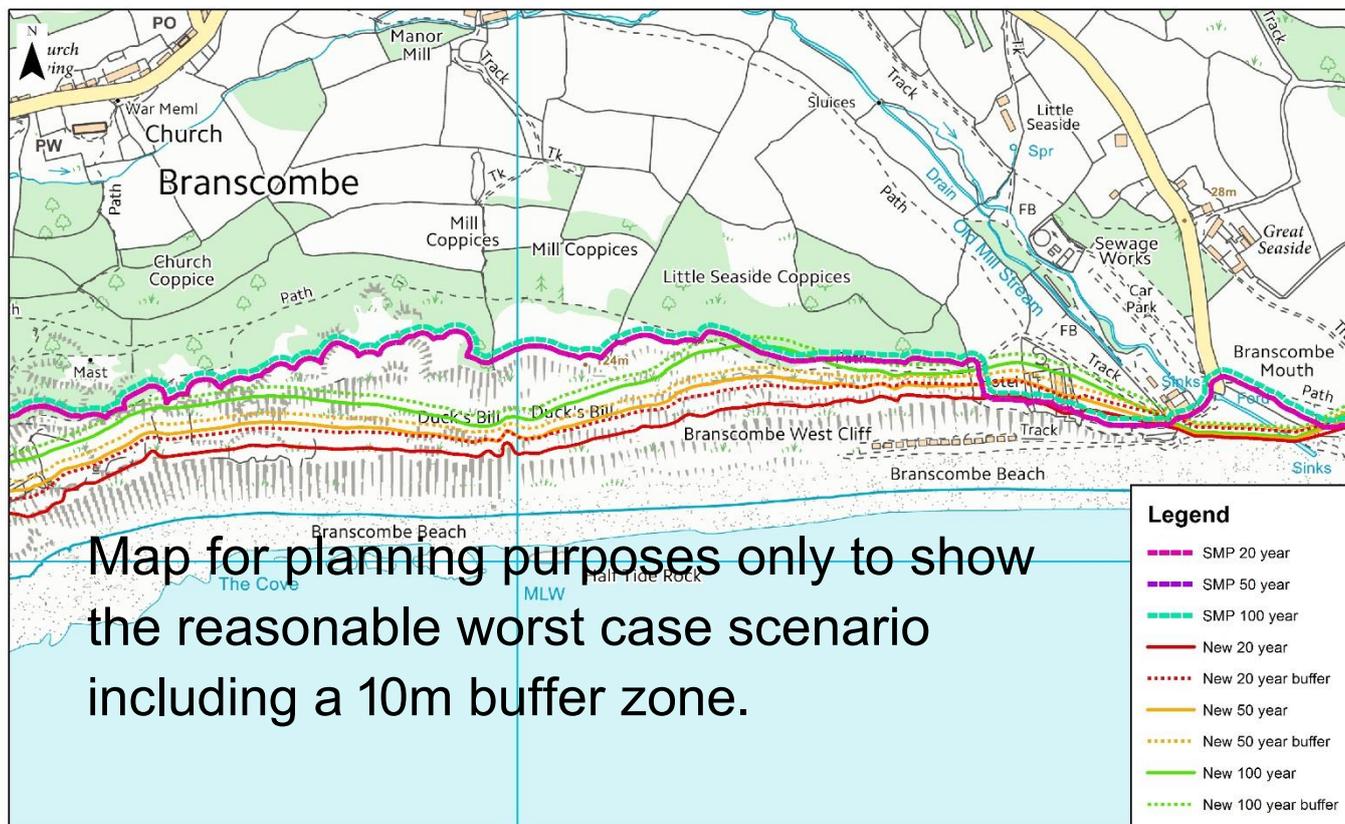
Map 5 Littlecombe Shoot to Branscombe Ebb



Key Points

- Along this section of coast the new erosion lines show less erosion than the SMP

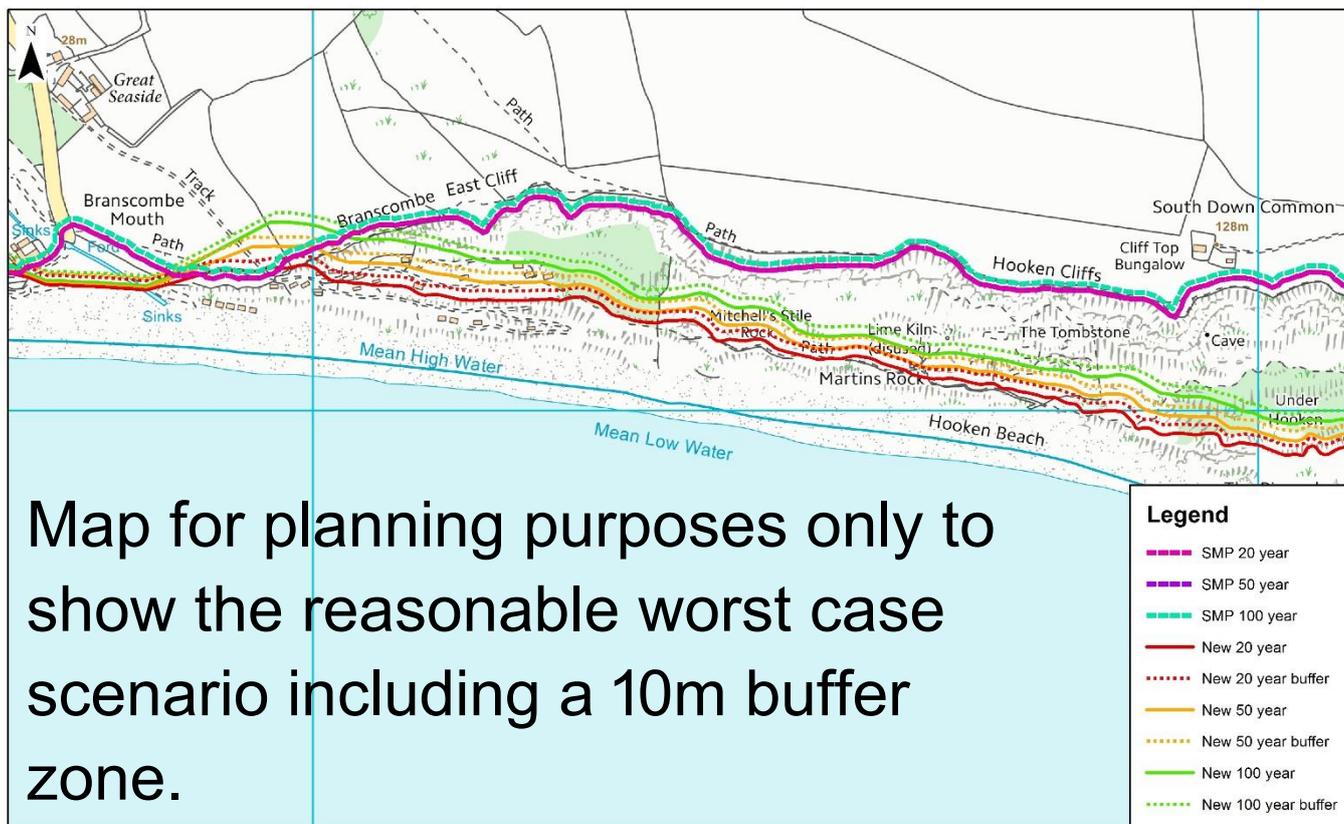
Map 6 Branscombe Beach



Key points

- The new erosion lines generally show less erosion than the SMP, with the exception of the area to the immediate west of Branscombe Mouth

Map 7 Branscombe Mouth to Hooken Beach



Key points

- With the exception of a small area to the immediate east of Branscombe Mouth, the new erosion lines show significantly less erosion than the SMP

Map 8 Beer Head

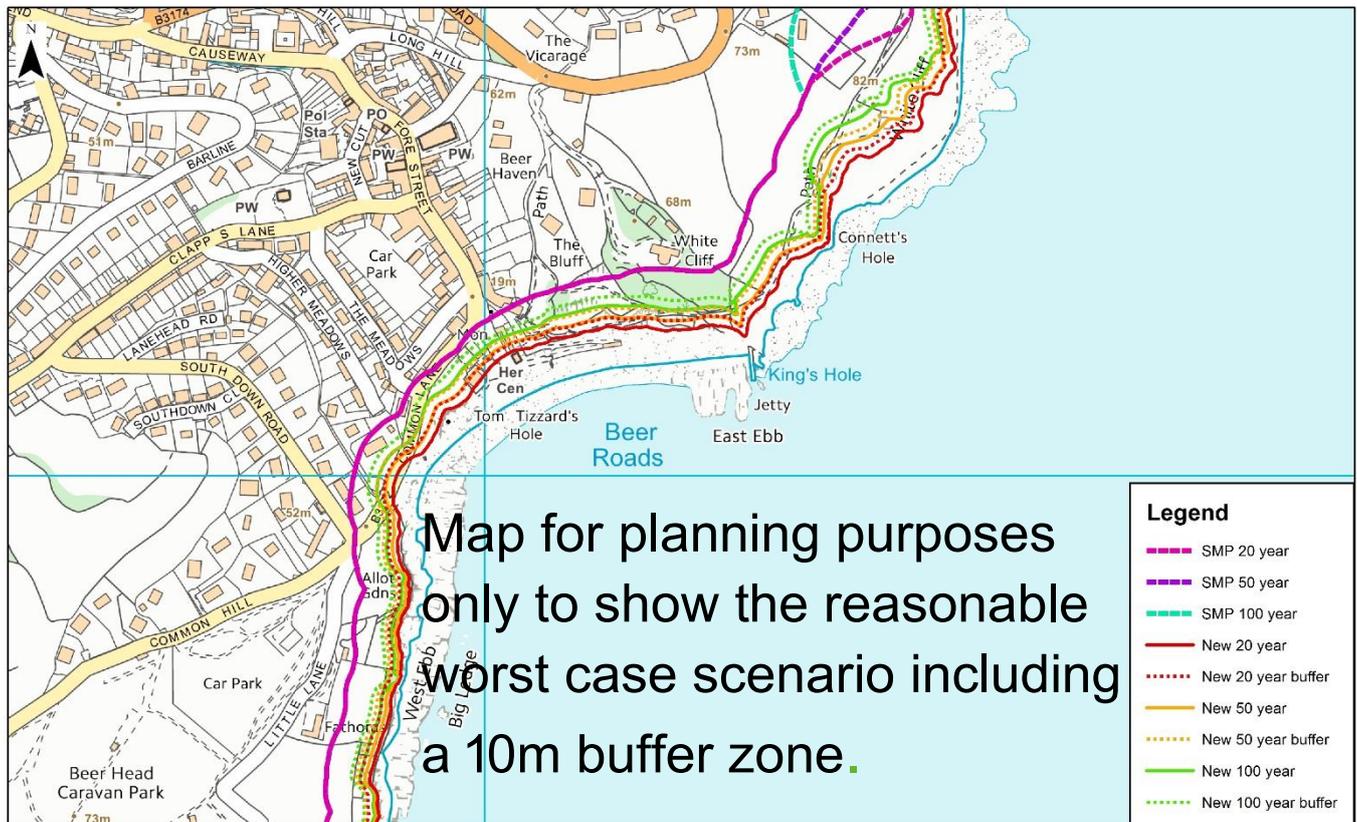


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Key points

- With the exception of a small section behind Little Beach, the new erosion lines show significantly less erosion than the SMP

Map 9 Beer

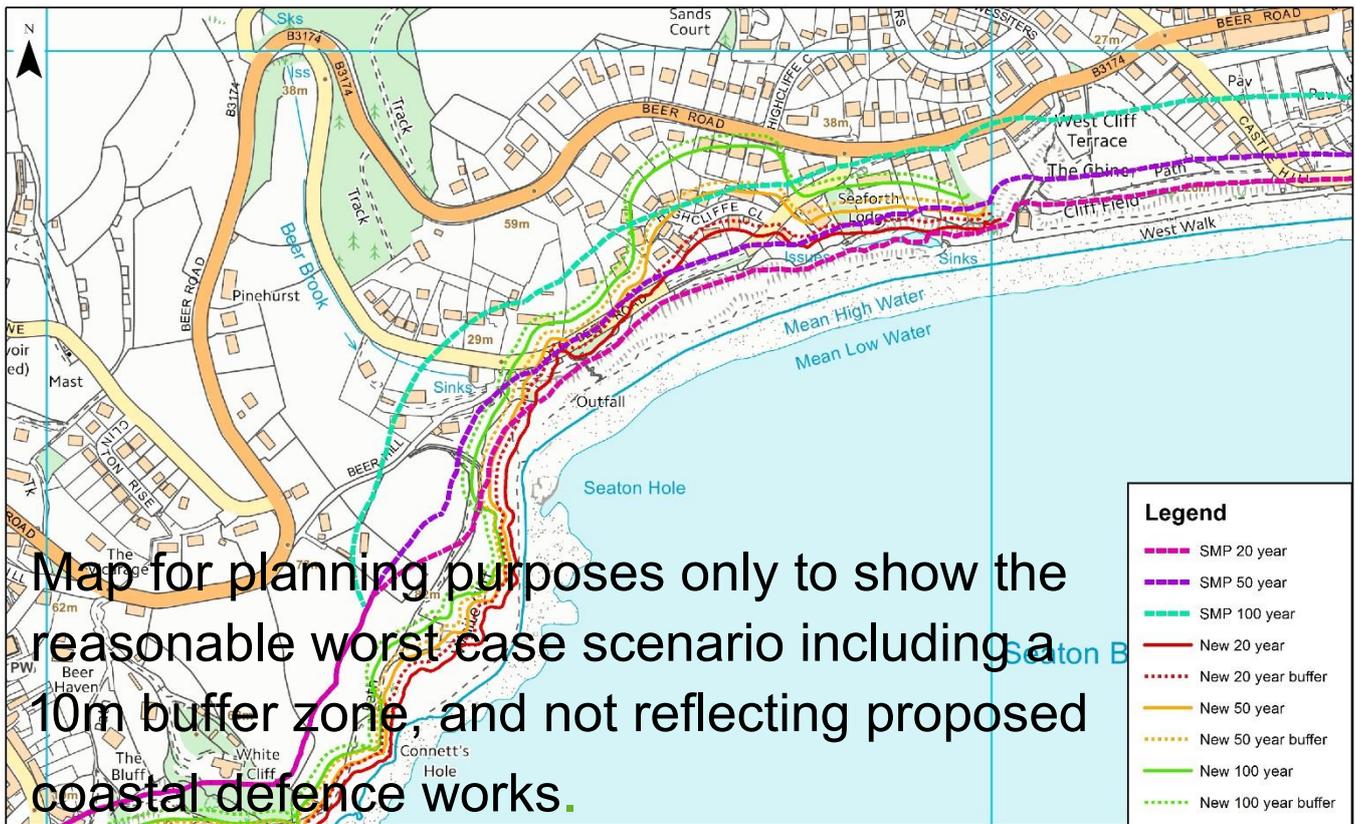


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Key points

- Along this stretch of coast the new erosion lines show less erosion than the SMP

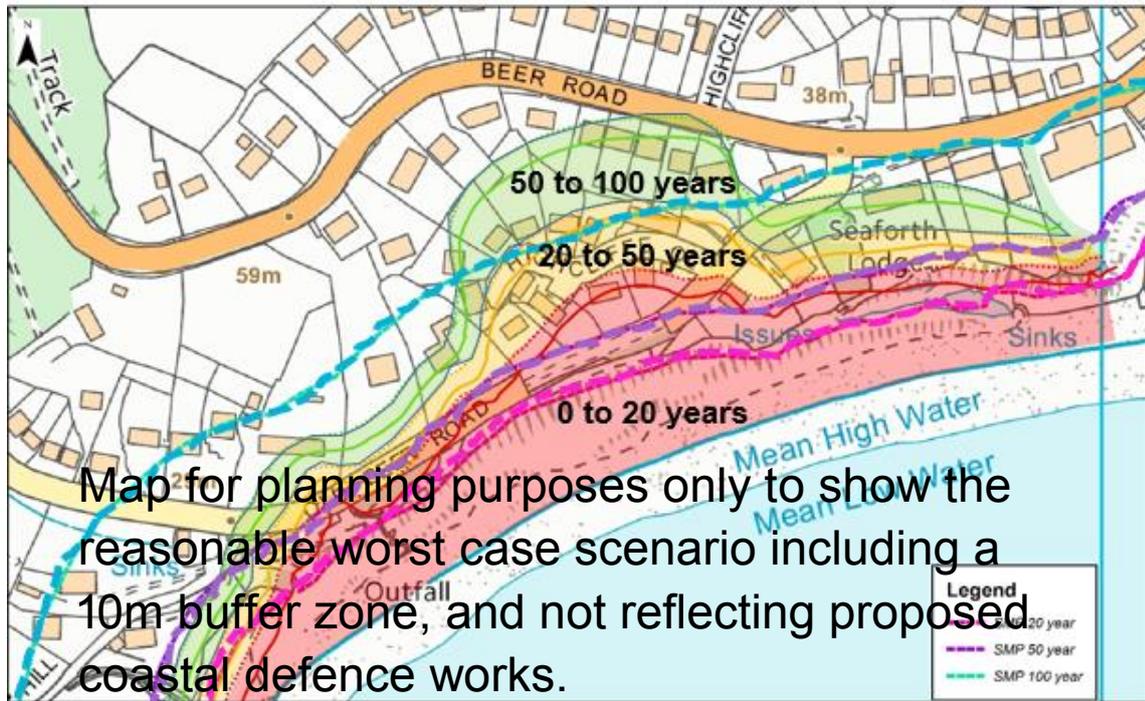
Map 10A Seaton Hole



Key points

- There is a very complex pattern of different erosion rates shown for this part of the coast.
- Whilst, generally the new erosion lines show less erosion than the SMP, on parts of Old Beer Road and in the vicinity of Highcliffe Close, they show more.
- An additional map has been prepared to make these differences clearer.
- The lines shown do not take account of the coastal protection works proposed in the Seaton Beach Management Plan.

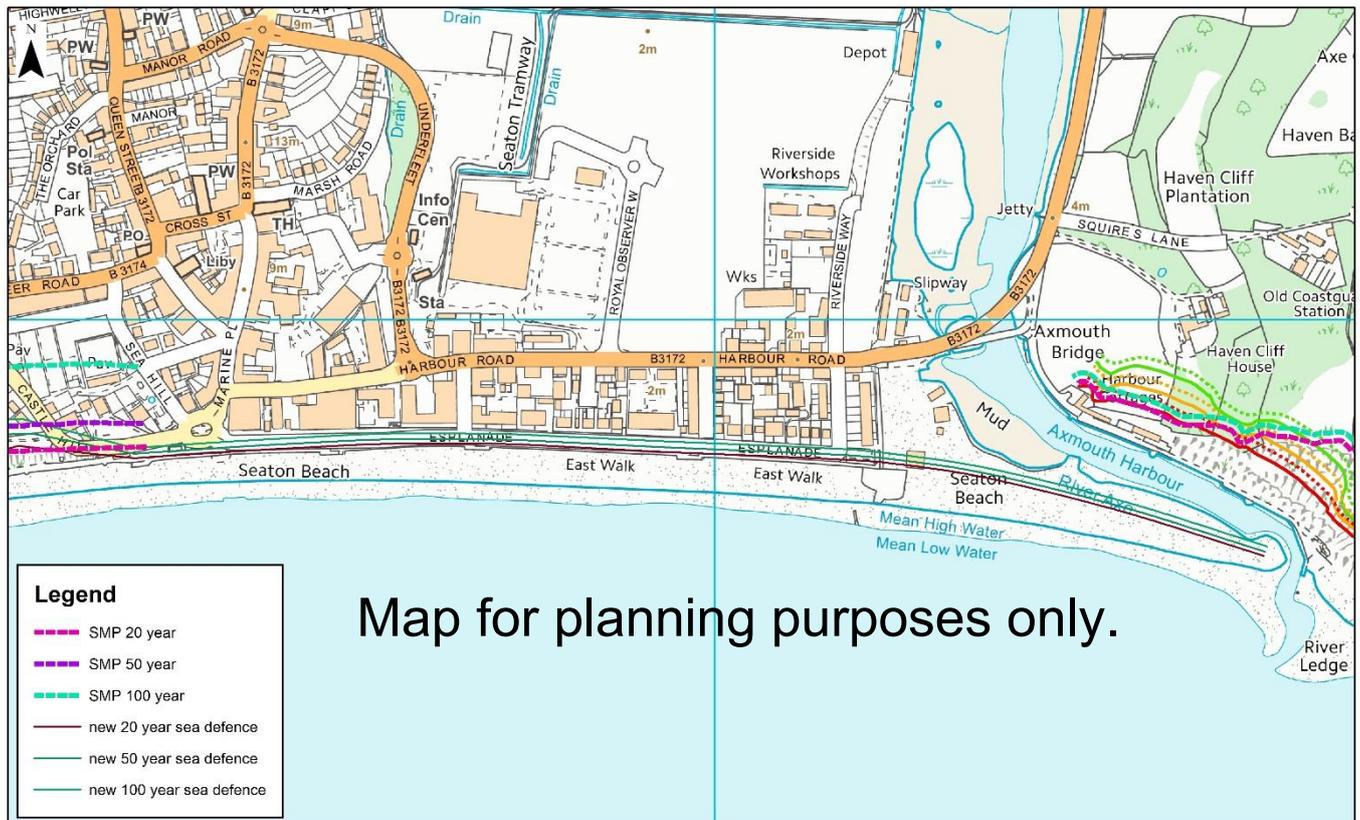
Map 10B Seaton Hole alternative map



Key points

- This map shows the areas shown to be at risk in the new research shaded in (pink for the first 20 years, yellow for 20 to 50 years and green for 50 to 100 years)
- The SMP lines 'cut through' the shaded lines to varying extents (in pink for up to 20 years, purple for 50 years and blue for 100 years)
- The new lines show part of Beer Road to be within the 'buffer' for the 100 year line
- The lines shown do not take account of the coastal protection works proposed in the Seaton Beach Management Plan.

Map 11 Seaton defended coast



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Key points

- The Shoreline Management Plan policy is to 'hold the line' along this section of coast, which is protected by the Seaton sea wall
- The new erosion line reflect this policy and do not show erosion

Map 12 Seaton Lower Estuary

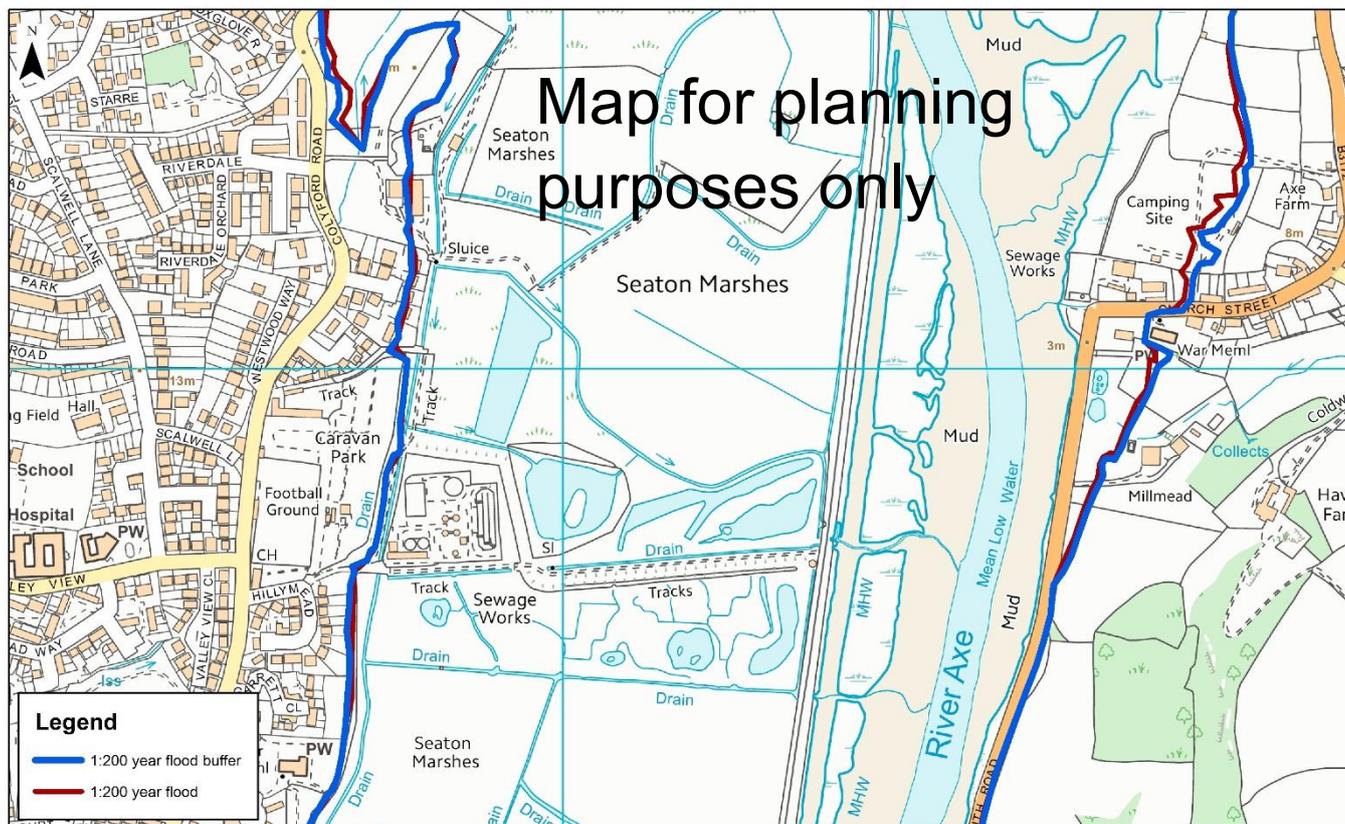


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Key points

- This plan shows the 1 in 200 year flood area produced by the Environment Agency (in red) to which a vertical buffer of 0.25 metres has been added (in blue).
- The Tesco store and surrounding housing are included in the 1 in 200 year 'Floodzone 2', but are not in the 1 in 100 year 'Floodzone 3'.
- The SMP policy for this area is to 'hold the line'

Map 13 Seaton Marshes

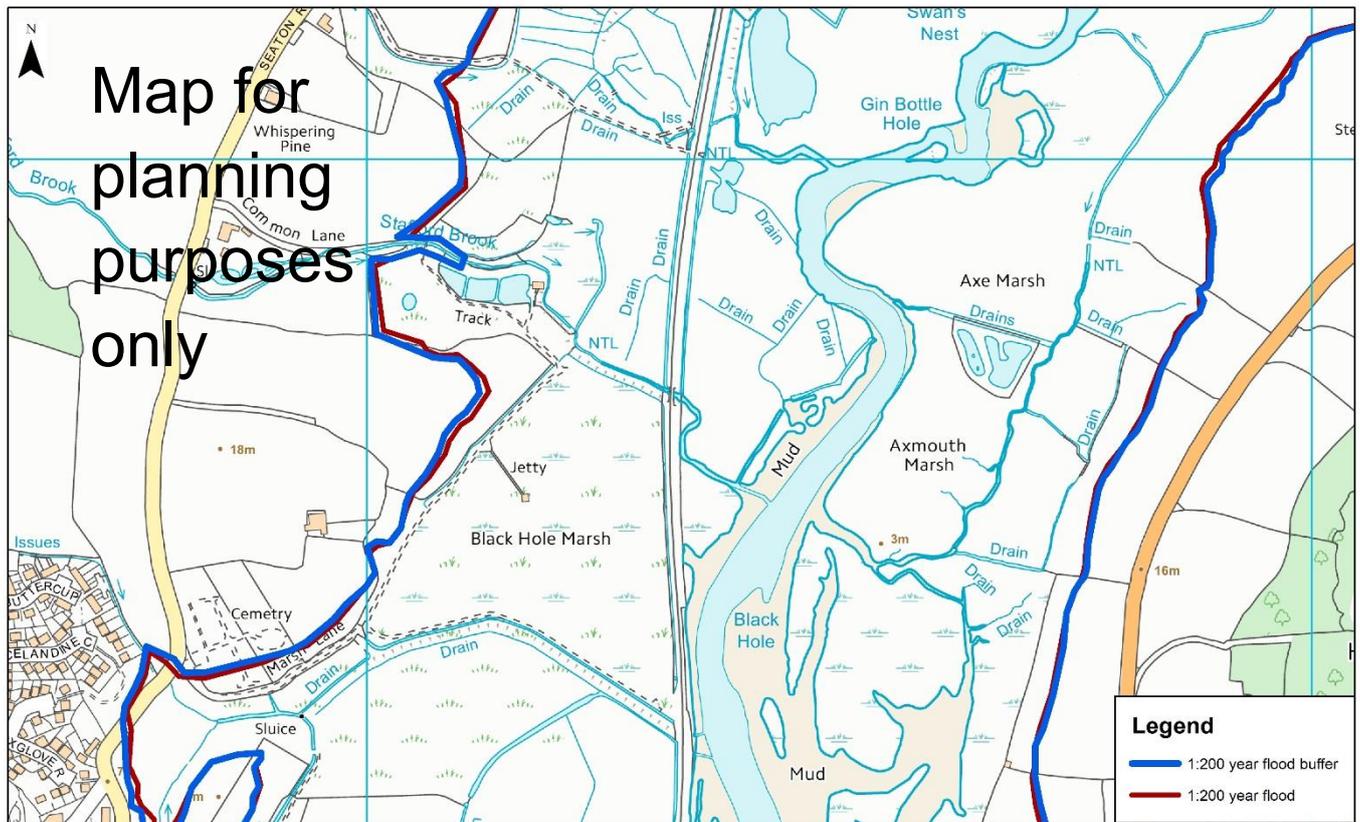


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Key points

- This plan shows the 1 in 200 year flood area produced by the Environment Agency (in red) to which a vertical buffer of 0.25 metres has been added (in blue).
- The SMP policy for this area is 'managed realignment' and it is recognised that there is a risk of flooding of the B3172 between Seaton and Axmouth

Map 14 Black Hole Marsh and Axmouth Marsh

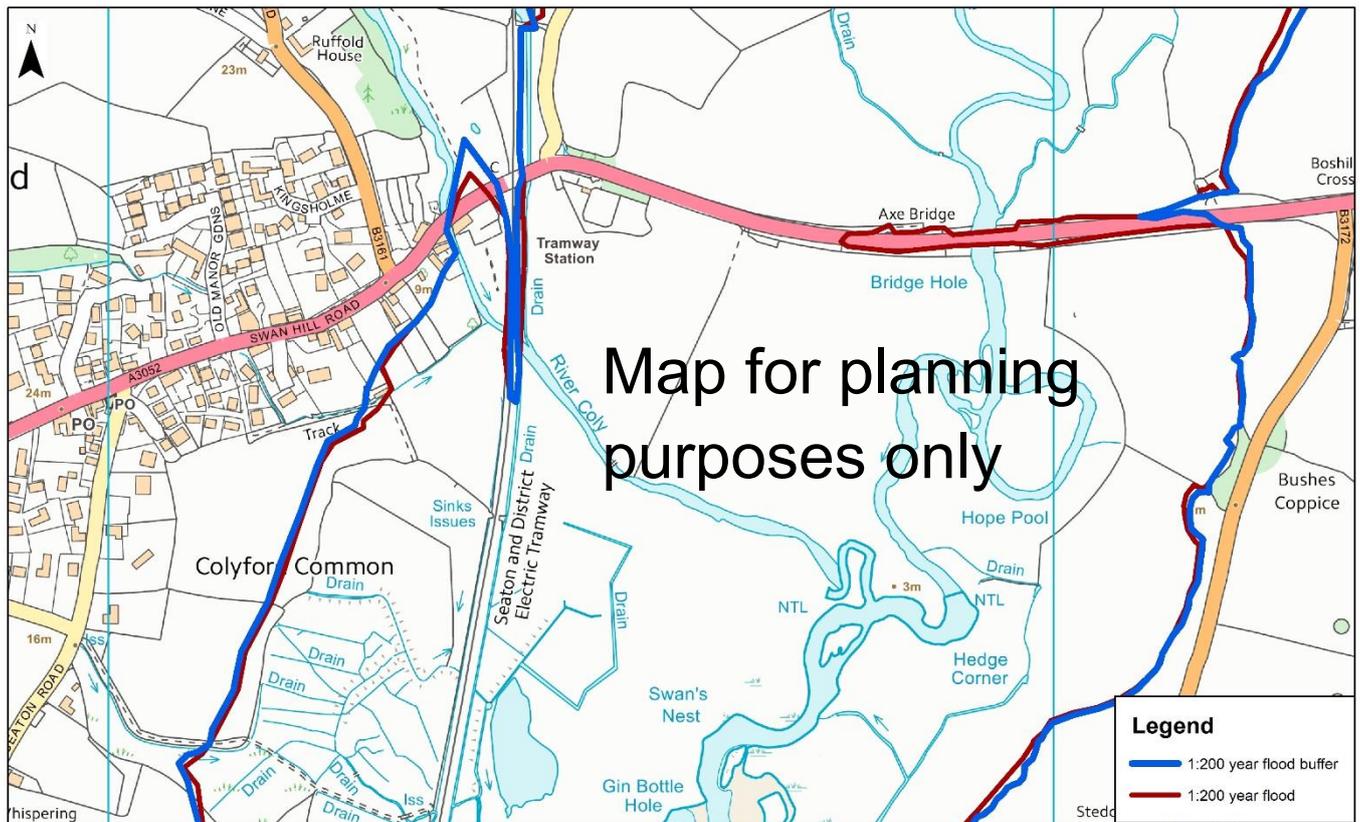


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Key points

- This plan shows the 1 in 200 year flood area produced by the Environment Agency (in red) to which a vertical buffer of 0.25 metres has been added (in blue).
- The SMP policy for this area is 'managed realignment'

Map 15 Axe Estuary East of Colyford

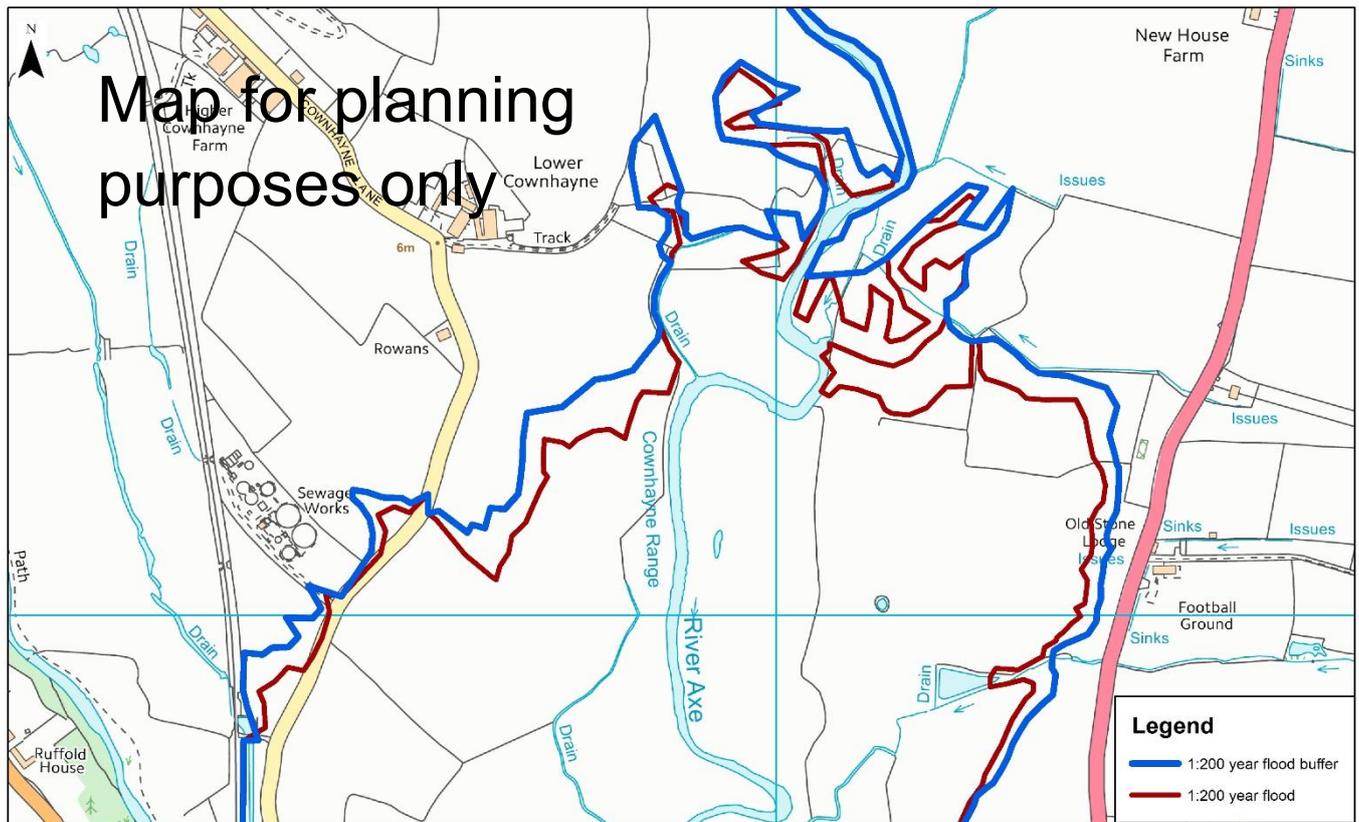


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Key points

- This plan shows the 1 in 200 year flood area produced by the Environment Agency (in red) to which a vertical buffer of 0.25 metres has been added (in blue).
- The SMP policy for this area is 'managed realignment' and it recognises that there may be loss of Grade 3 and 4 agricultural land and an increased risk of flooding of the A3052 at Colyford.

Map 16 Axe Estuary North East of Colyford

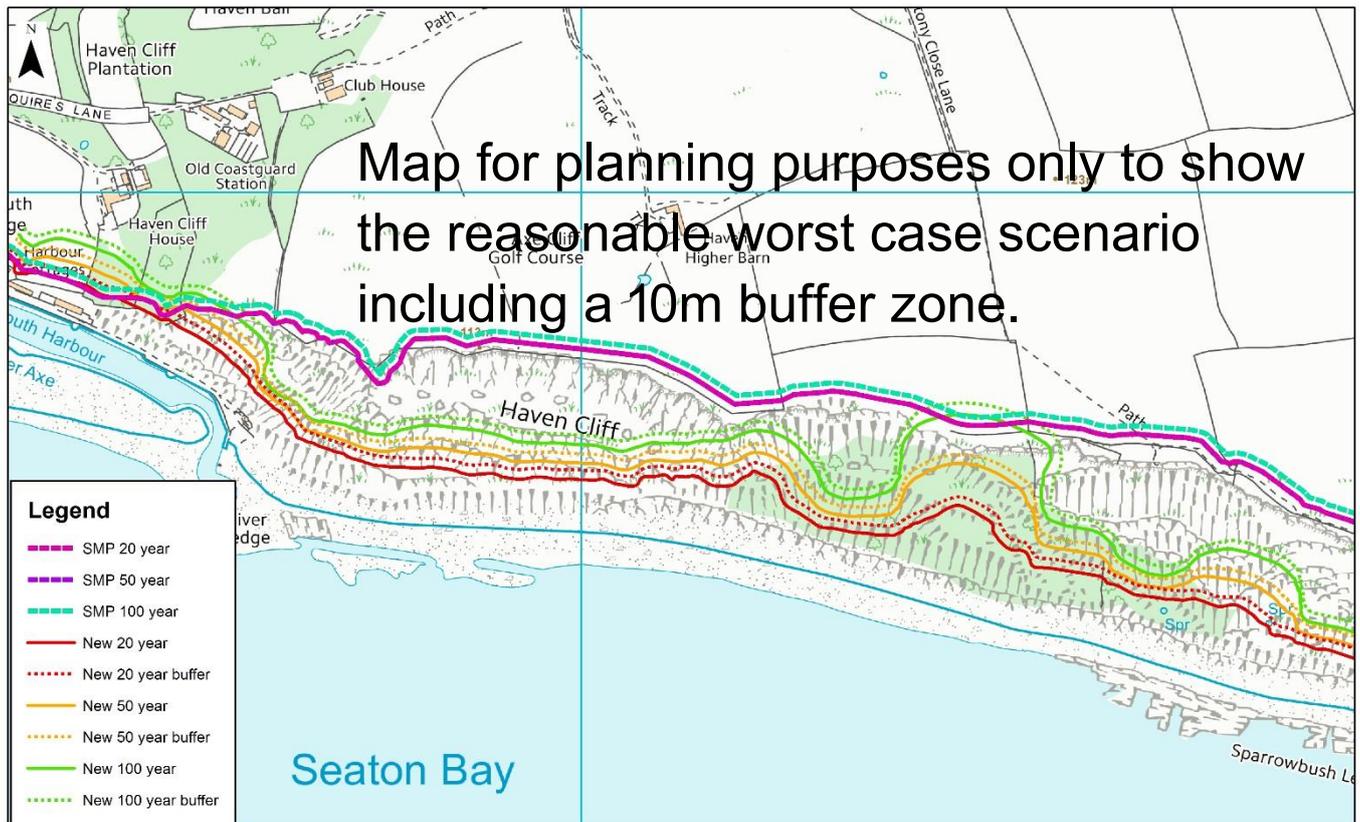


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Key points

- This plan shows the 1 in 200 year flood area produced by the Environment Agency (in red) to which a vertical buffer of 0.25 metres has been added (in blue).

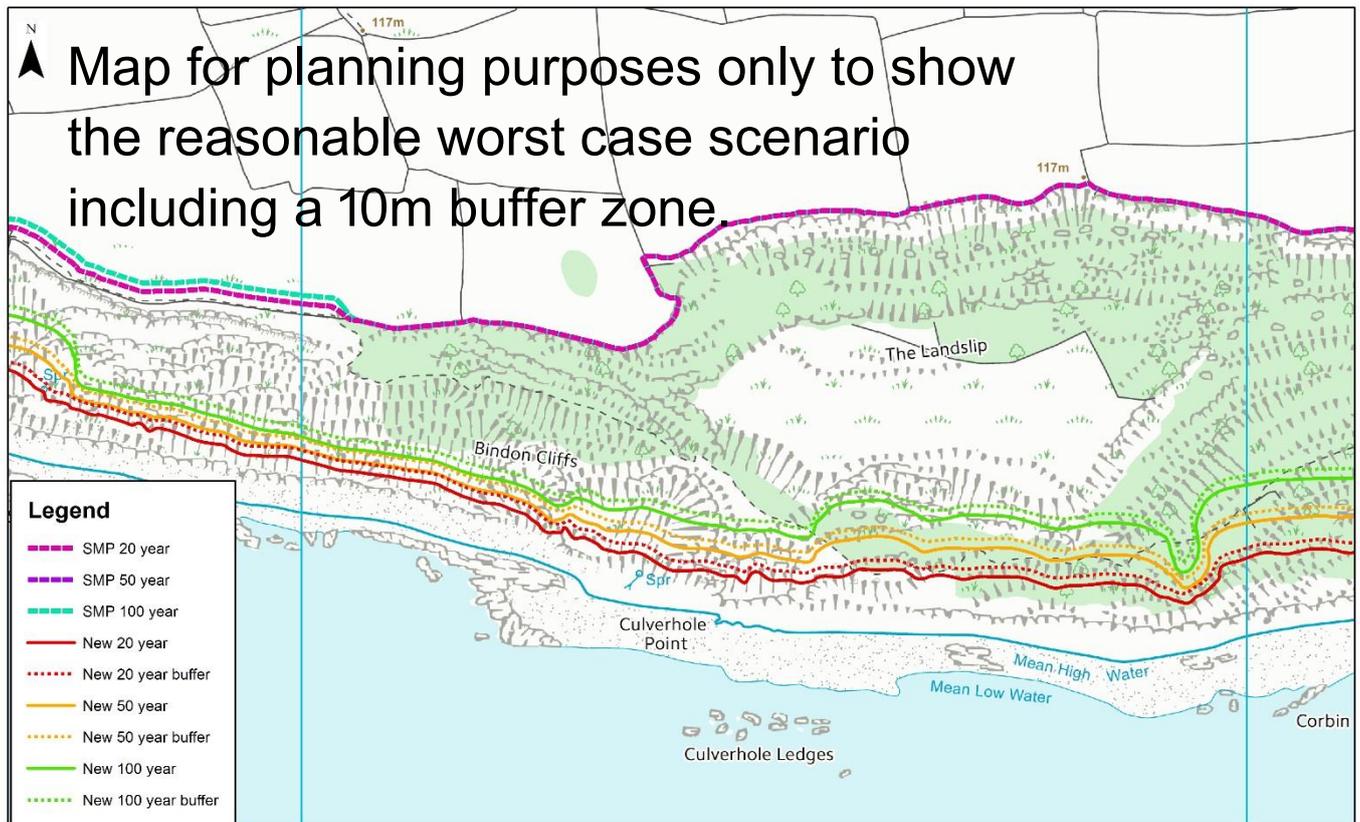
Map 17 Haven Cliff east of Seaton



Key points

- The new erosion lines show more variation than the SMP lines, but generally less erosion

Map 18 Binden Cliffs and The Landslip



Key points

- The new erosion lines show significantly less erosion than the SMP
- The difference is over 350 metres in some places

Map 19 Downland Cliffs and Landslip to Rousden Cliffs

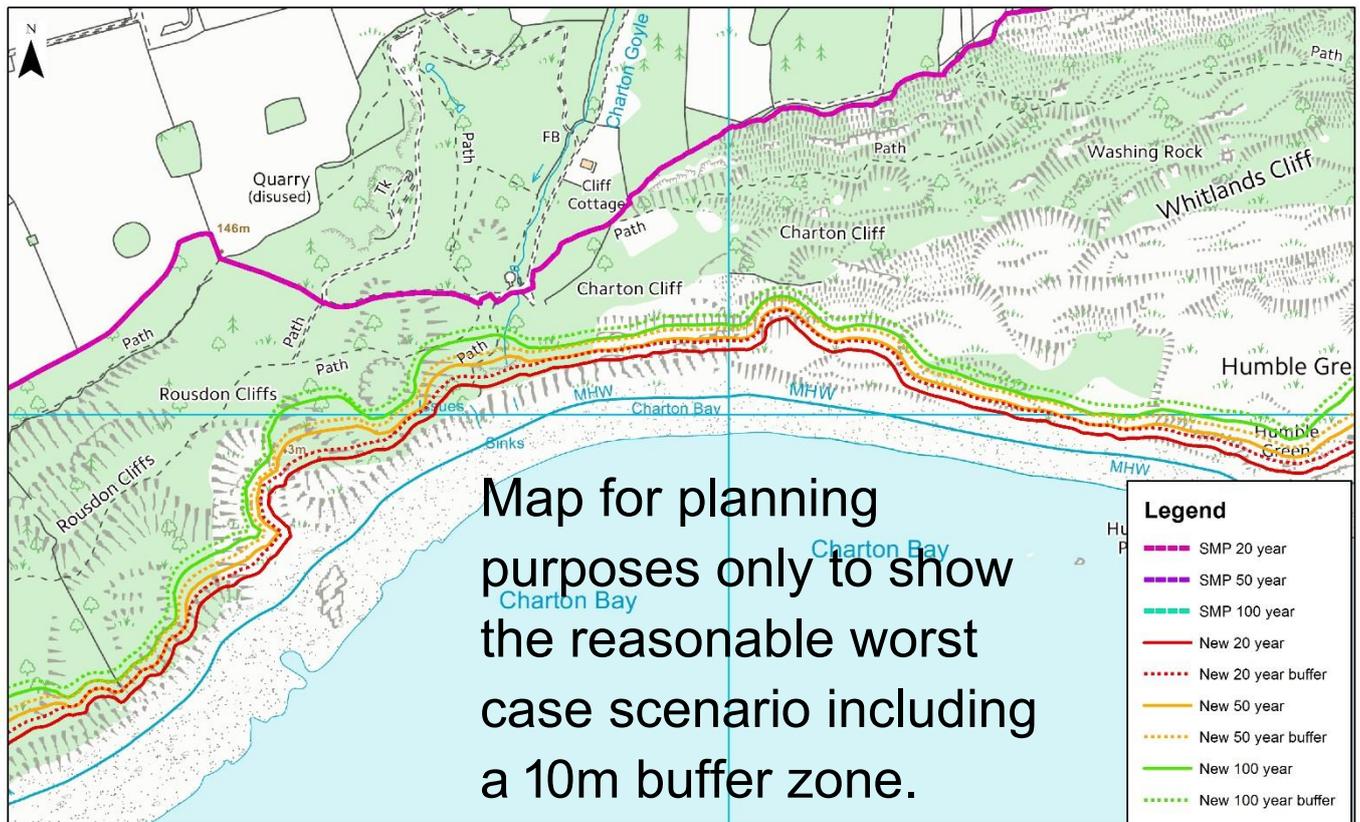


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Key points

- The new erosion lines show significantly less erosion than the SMP

Map 20 Charleton Bay



Key points

- The new erosion maps show significantly less erosion than the SMP

Map 21 Humble Green to Pinhay Cliffs

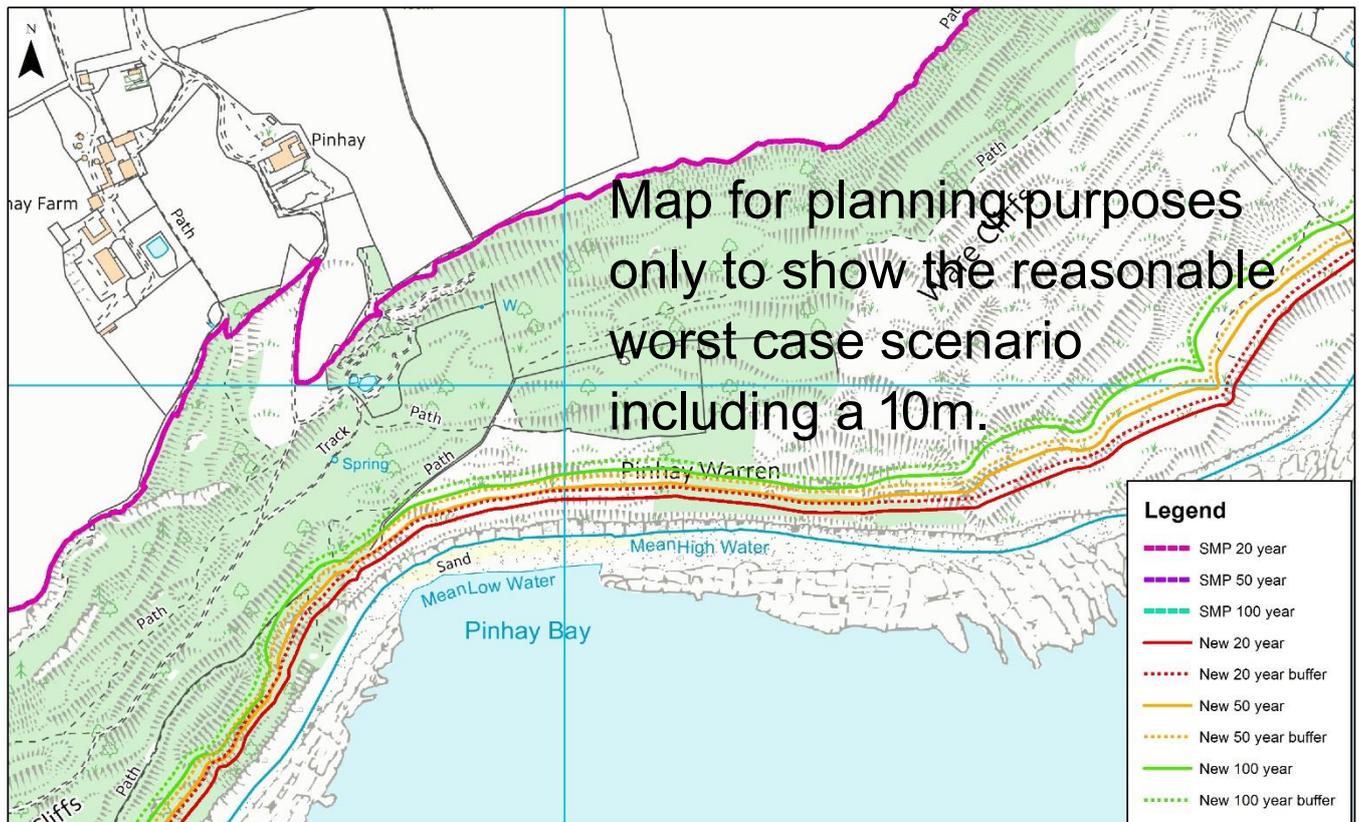


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Key points

- The new erosion lines show significantly less erosion than the SMP; in some cases the difference is over 550 metres

Map 22 Pinhay Bay



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Main points

- On this section of coast the new erosion lines show significantly less erosion

Map 23 Ware Cliffs to Monmouth Beach, Lyme Regis



Main points

- In this section of coast the new erosion lines show significantly less erosion than the SMP

