

C.5 SCENARIO REF: BASELINE CASE 2 – WITH PRESENT MANAGEMENT



C.5.1 INTRODUCTION

This section provides an analysis of shoreline response assuming the scenario of “With Present Management”. This scenario has considered that all existing defence practices will continue, accepting that in some cases this will require considerable improvement to present defences in order to maintain their integrity and effectiveness. The descriptions are based on the With Present Management erosion maps (Section C.3).

Policy Unit	Location	WITH PRESENT MANAGEMENT SCENARIO: Epoch (Years)		
		0-20 (2025)	20-50 (2055)	50-100 (2105)
DUR1	Durlston head to Durlston Cliff Flats	<p>Durlston Bay is comprised of the 3 policy units DUR1, DUR2 and DUR3. All of these units are undefended (apart from DUR2) and comprise steep eroding cliffs and landsliding complexes which face due east, affording some protection from the prevailing wind and wave direction. There is only a limited beach to offer any protection against marine erosion. There was some cliff retreat mitigation works in 1988 and 2002 in order to increase drainage and stabilise the cliff line following rapid retreat towards several nearby residences, with rock revetment placed at DUR2 to protect the flats. Nearshore sediment transport is from south to north whilst offshore the transport is thought to be north to south transporting material out of the bay towards the English Channel. Due to the high cliffs there are no properties predicted to be at risk from flooding over the next 100 years. However cliff line retreat is estimated at 12m over the next 20 years for the whole of the bay but this will not impact on any properties. Given that DUR2 is a landsliding system, erosion of the cliff top is predicted as a precaution even though there will be continued toe protection under this scenario.</p>	<p>During the 20-50 year epoch erosion retreat is estimated to be a further 18m for the whole bay, with 25 properties now placed at risk from erosion within DUR1 and 2 properties in DUR2. Given that DUR2 is a landsliding system, erosion of the cliff top is predicted as a precaution even though there will be continued toe protection under this scenario. The headland at Peveril Point will erode back to the northwest and may begin to impact on several roads and property boundaries within policy unit SWA1 although the general plan shape of the bay is not predicted to change significantly over the next 50 years.</p>	<p>Erosion of the cliff line within Durlston Bay is predicted to increase by a further 30m for the entire cliff top length. A total of 48 properties will now be at risk from erosion in DUR1, a total of 5 properties in DUR 2 and a total of 24 properties in DUR3. Given that DUR2 is a landsliding system, erosion of the cliff top is predicted as a precaution even though there will be continued toe protection under this scenario. The bay is not predicted to change in plan shape significantly although the landslip areas are unpredictable and may impact on the local area. Peveril Head will erode from the south into SWA1 and thus begin to impact upon assets within this unit as it gradually begins to narrow in width and length. Due to the sediment transport direction, it is unlikely any significant beach will form at the cliff base within the bay.</p>
DUR2	Durlston Cliff Flats			
DUR3	Durlston Cliff flats to Peveril Point			

SWA1	Peveril Point to Swanage Pier	This policy unit consists of the rocky headland at the south end of Swanage Bay from Peveril Point to the Swanage Pier. There is very little beach other than adjacent to Swanage Pier, which gradually diminishes eastwards towards the headland. East of the pier there are 8 rock groynes backed by concrete seawall, several slipways and the Lifeboat station. The defences should still be effective in this epoch, resulting in no properties at risk of erosion or flooding.	After year 30, all defences in this unit would need to be upgraded in order to maintain the line of defence and prevent erosion impacting on properties along this section. However the undefended section of coastline to the south of Peveril Head (policy unit DUR3) will begin to erode landwards reducing the width of the headland from the south.	If the defences in this unit are maintained and upgraded during the 50-100 year epoch, there will be no erosion or risk to property. However, the headland is expected to have eroded up to 60m from the south due to the undefended cliffs within policy unit DUR3.
SWA2	Swanage Pier to Outfall Jetty	The majority of this policy unit is composed of sand, with exception of the southernmost section in which the beach narrows and more gravel and rock dominate. Timber groynes and a seawall protect the road that runs immediately adjacent to the shoreline. The beach was replenished in December 2005, which helps to protect the seawall from wave attack. If current management strategies and structures are sustained, then no erosion or flooding is predicted. There is a need for future replenishments otherwise the beach is likely to narrow, and therefore increase the risk of the failure of the seawall.		
SWA3	Outfall Jetty to Sheps Hollow	<p>The soft Wealden cliffs that are found in the north of Swanage Bay gradually reduce in height within this policy unit. The sandy beach has various defence structures in place, including timber groynes and a seawall. The seawall in the central and northern areas of this unit, defending the toe of the cliff, is in need of repair in some parts. Further south, the seawall protects the road and property that run parallel with the shoreline. There is a need for future replenishments otherwise the beach is likely to narrow, and therefore increase the risk of the failure of the seawall.</p> <p>There is no strong littoral drift of foreshore sediments along this frontage; several studies suggest there is a general south to north drift that operates within the bay, although short-term drift reversal takes place.</p> <p>Assuming the defences are maintained sufficiently and replenishments continue, there should be no properties at risk within this unit.</p>		
SWA4	Sheps Hollow to Ballard Point	This stretch of coastline is comprised of two geologically different rock types, with Punfield Cove marking a divide between the resistant chalk cliffs of Ballard Cliff in the north (SWA5) and relatively soft Wealden Beds to the south of the unit. The sandy beach in	Erosion is expected to continue at a similar rate, with the cliff line retreating a further 18m landward during the 20-50 year epoch and a further 30m during the 50-100 year epoch. Material would be removed offshore and then transported northwards. There are no assets at risk.	

		<p>front of the cliffs to the south of the unit gradually diminishes northwards, migrating into a rockier substrate at the toe of the chalk cliffs in SWA5. SWA4 is undefended and undeveloped.</p> <p>Erosion rates during this epoch are predicted to be up to 12m. Cliff mass movements in the soft Wealden Beds would be generated by toe erosion and steepening of the cliffs, combined with groundwater seepage and mudflows. Any material produced by such active landsliding would be moved offshore and transported in a northward direction. Given that this region is undeveloped, there are no assets at risk.</p>	
SWA5	Ballard Point to Handfast Point	<p>This policy unit stretches from Handfast Point, marking the sediment transport boundary, to Ballard point. It consists of near vertical, resistant chalk cliffs, measuring up to 50m in height, with a series of embayment's, stacks and arches cut along joint planes in the chalk. There are no developments, properties or infrastructure. Due to the nature of this unit, there are no defences present.</p> <p>Predicted erosion rates along this stretch of coast are approximately 5m in 20 years, a further 12m in 50 years and a further 23m in 100 years. There are no properties in this region at risk from erosion or flooding. It is believed that eroded material from the cliffs is broken down and the flint content contributes sediment to 'pocket' beaches along this coastline, with some of this coarse material moving from onshore to offshore locations.</p>	
STU1	Handfast Point to the Warren	<p>This policy consists of north-facing chalk cliffs, ranging up to 26m in height, extending from Handfast Point to Warren Wood. The abrupt change in orientation of the coastline at Warren Wood marks the junction of these resistant chalk cliffs, with the softer Tertiary sediments that is prevalent in STU2. There are no defences currently present along this stretch of shoreline.</p> <p>Predicted erosion rates along this stretch of coast are approximately 5m in 20 years, a further 12m in 50 years and a further 23m in 100 years. There is a net littoral movement eastwards which feeds a small supply of gravel to small inlet beaches at the base of the chalk cliffs, which is then transferred in a northern direction towards Redend Point (in STU2). This policy unit is undeveloped, so there is no property or infrastructure at risk.</p>	

STU2	The Warren to Studland Sandspit	<p>The majority of the policy unit is low lying with undefended soft cliffs. The only exception is below the Middle Beach car park, immediately north of Redend Point, in which there are gabions, rock armour and a short seawall in place. These will require upgrade after year 5-20 in order to protect the car park and café on the higher ground above the beach. Littoral drift in this area is in a northward direction, with erosion of the coastline feeding sediment to the Studland Peninsula, but with much of the clay, silt and fine sand fractions moving offshore as suspended load. Due to the lack of any defence structures within the majority of this unit, the predicted rates of erosion are very similar to that of the no active intervention scenario. Northern sections are estimated to retreat by up to 13m in 20 years, 32m in 50 years and 64m in 100 years. This may have implications for the southern Knoll Beach car park. Erosion is also expected to occur south of Redend Point, but at a lower rate of 5-8m in 20 years, a further 12-20m in 50 years and a further 23-40m in 100 years, however there are no assets at risk. Such erosion will provide an increased sediment supply to STU3.</p>		
STU3	Studland Sandspit	<p>This policy unit encompasses a large majority of the Studland Bay. It is a relatively large, sandy beach, backed by an established dune system, with a weak to moderate northwards littoral drift. There are concerns that this region is showing evidence of a landward realignment, with potential to trigger increased erosion rates. There are no defences in this unit or properties at risk from erosion.</p> <p>The rate of erosion decreases from 0.7m a year in the south of the unit, resulting in 14m of erosion to 0.2m a year in the north, resulting in 4m of erosion by year 20. Erosion of the southern dune system would initially supply more material to the northern end of the unit.</p>	<p>Within 50 years, erosion would continue at a similar rate, with an additional 35m in the south and an additional 10m of erosion predicted for the northern tip by 2055. No properties would be at risk from these changes.</p>	<p>This frontage is predicted to continue to erode at a steady rate with 70m of erosion in total, predicted in the south and 20m of erosion in total predicted for the northern section over the next 100 years. Despite these changes in plan shape there would be no significant impacts to assets over this period. The sediment released from the eroding dunes would be transported northwards, feeding into the transport system around Poole Harbour entrance. There is uncertainty over sediment transport pathways within this area, although there are possible exchanges between Poole Harbour, Sandbanks and Studland.</p>
STU4	Shell Bay	<p>Shell Bay is largely an undefended stretch of coast. The only exception is at South Haven Point, at the northern end of the unit, which has a small rock revetment that provides protection to the vehicle ferry slipway. The beach consists largely of sand and is backed</p>	<p>A similar rate of accretion is expected to continue between 20 and 50 years, with an additional 13m of accretion estimated for the dunes and a further loss of 3-12m estimated around the southern tip. This accretion at South Haven Point may impact on the ferry</p>	<p>Within 100 years, a total of up to 45m of seaward gain is predicted for the northern half of the unit. The southern tip of this unit is predicted to erode up to 40m. Sediment interactions between Studland Bay and the Poole Harbour ebb delta allow sediment to</p>

		<p>by a large dune system. There is a net north-westwards littoral drift along this sector. It is thought that the Studland Peninsula appears to be undergoing a degree of landward re-alignment, with Shell Bay subjected to varying accretion rates.</p> <p>There is a level of uncertainty about the future of this region. It is thought that there could be a prograding dune system that is predicted to accrete up to 9m in the next 20 years for the northern half of the unit. The southern tip of the unit is predicted to erode by 8m over this period. There are no properties at risk to erosion or tidal flooding during this epoch.</p>	<p>slipway, causing complications for vehicles wishing to access the Peninsula as it extends northwards.</p> <p>There are no properties at risk to erosion during this epoch. The defence located in PHB4 would require upgrade in this epoch in order to protect 5 properties situated in STU4 from tidal flooding.</p>	<p>be transported both into the harbour and eastwards to Sandbanks. No properties are predicted to be at risk from erosion during this period.</p> <p>Provided the defence located in PHB4 is upgraded, there is no risk to property from tidal flooding.</p>
PHB1	<p>The Islands (excluding Brownsea) Furzey, Green Round, Long Islands</p>	<p>This unit consists of the smaller islands within the south of Poole Harbour to include the Furzey, Green, Round and Long Islands. These islands are all undefended and have active and degraded cliffs made up of marsh sediments, sands and rock lithology which suffer from small scale mass movements and localised gulleying. Erosion is predicted to occur to all the islands at up to 8m during the next 20 years, with the exception of any shoreline protected by saltmarsh. This is not expected to affect any properties.</p> <p>There are no properties predicted to be at risk from tidal flooding.</p>	<p>During the 20-50 year epoch erosion of the shoreline is expected to increase to a further 20m for all islands, although this is not predicted to place any properties at risk. Erosion to the shoreline behind saltmarsh is now predicted to occur, resulting in 12m of erosion during this epoch.</p> <p>There are no properties predicted to be at risk from tidal flooding.</p>	<p>Erosion rates will continue with an additional 40m of erosion during 50-100years. This will place 3 properties at risk on Round Island with significant erosion to the remaining islands within PHB1. During this time the mouth of the harbour is predicted to widen, in response to an increased tidal prism.</p> <p>There are no properties predicted to be at risk from tidal flooding.</p>

PHB2	Brownsea Island (Eastern Defended Section)	<p>These policy units cover Brownsea Island, the largest island within Poole Harbour. Sediment transport is thought to be from west to east around the island. Much of the island is surrounded by steep sloped cliffs which are vegetated on the north side and more vulnerable to erosion on the south side of the island. On the northeast corner of the island is a lagoon fronted by a thin strip of land which was originally several thin spits.</p>	<p>Up to 20m of erosion is predicted during the 20-50 year epoch and an additional 40m during the 50-100 year epoch for the undefended shoreline. The properties located in PHB2 should not be at risk, assuming the defences are upgraded.</p>
PHB3	Brownsea Island (Undefended Western Section)	<p>The east end of the island is covered by policy unit PHB2 which is defended by a sea wall, timber groynes and a rock revetment, with the remainder of the island undefended, covered by policy unit PHB3. The defences protecting Branksea Castle from erosion have a residual life of approximately 8 years and would require upgrade after this time to protect the shoreline from flooding and erosion. The residual life of the defences protecting the remainder of PHB2 from flooding, are unknown. If these defences are upgraded and maintained there should be no risk to property from erosion or flooding. Erosion over the remainder of the undefended island is expected to be up to 8m over the next 20 years, with no risk to property.</p>	

<p>PHB4</p>	<p>South Haven Point to Hyde's Quay</p>	<p>This policy unit is largely undefended as it is composed of natural mudflats, saltmarsh, tidal inlets, sandy beaches and a vegetated shoreline. There is predicted to be some low level erosion of the mudflats and saltmarsh over the next 20 years, however this may be offset by natural migration inland. Erosion to higher land is predicted to be 6m during this epoch, with no impact to any assets. There is one property at risk of flooding.</p>	<p>The inter-tidal area will continue to erode at the seaward edge but should be offset by natural migration inland.</p> <p>Erosion of the higher land will continue with up to 20m expected during the 20-50 year epoch and up to 40m predicted between 50-100 years which will place a total of 3 properties at risk. There are 6 properties predicted to be at risk from flooding between 20-100 years.</p> <p>The tidal prism of the harbour is predicted to increase with sea level rise, with increased levels of material stored within the ebb and flood tidal delta. Additionally the entrance to the harbour may attempt to widen or deepen to accommodate the increased volume of water within the harbour, affecting the very east of this policy unit.</p> <p>Arne peninsula has the potential to become an island under a 1:200 year storm event by the end of the 100 year epoch.</p>
<p>PHB5</p>	<p>Hyde's Quay to Holton Point</p>	<p>This unit consists of both tidal and reclaimed marsh land which is backed by raised earth bank defences in the south west corner of the harbour where the River Frome discharges into Poole Harbour. These defences are predicted to have a residual life of approximately 20 years and would require maintenance after this period to continue to provide protection, although there may be some back flooding risk associated with the undefended section of harbour at PHB4.</p> <p>The defences would cause coastal squeeze to the fronting inter-tidal habitats.</p> <p>Up to 6m of erosion is predicted at the higher land at Holten, in the far east of the unit. There are no properties at risk,</p>	<p>Coastal squeeze to the fronting inter-tidal habitats will result from flood defence upgrade in the 20-50 and 50-100 year epochs.</p> <p>Up to 18m of erosion is predicted at the higher land at Holten in the 20-50 year epoch, followed by an additional 38m in the 50-100 year epoch. There are no properties at risk, although a 500m section of railway line could be eroded by the last epoch if no new defences are constructed.</p>

		although the railway line may become at risk and require construction of a defence.	
PHB6	Lytchett Bay	<p>Lytchett Bay is in the north west corner of Poole Harbour largely composed of soft mud fringed by marshland and embankment. The embankments to the west of the bay are predicted to deteriorate in this epoch and would therefore require upgrade in order to prevent flooding to the A35. Any upgraded defences would cause coastal squeeze to the fronting inter-tidal habitats.</p> <p>There are 21 properties at risk to tidal flooding in this epoch.</p> <p>To the south is the only opening to Poole harbour, with a railway bridge across the opening and Rockley Sands to the east. The bridge restricts sediment transport from the Sherford river resulting in a sediment sink.</p>	<p>Given the lack of defences on the eastern side of the bay, 435 properties will be at risk to tidal flooding in 100 years with sea level rise.</p> <p>Coastal squeeze to the fronting inter-tidal habitats will result from flood defence upgrade.</p>
PHB7	Rockley Viaduct to start of defence 681/2442	<p>This unit has thin sandy beaches backed by low eroding cliffs which feed a small spit at the entrance to Lytchett Bay (PHB6). There is a net west to east drift of the cliff derived material and the shoreline here is largely undefended with defences only in front of Rockley caravan park. These have a residual life of approximately 5-10 years, after which the gabions will require upgrading in order to protect the caravan park from erosion. The remainder of the undefended shoreline is predicted to</p>	<p>Assuming defences are maintained over the next 80 years, the only risk will be to the sailing club from the south- side.</p> <p>The remainder of the undefended shoreline is predicted to erode a further 25m during the 20-50 year epoch and an additional 50m during the 50-100 year epoch, impacting on Hams Common and the carpark at the southern end of this unit.</p>

		<p>undergo up to 10m of erosion over the next 20 years.</p> <p>So long as defences are upgraded there is predicted to be no properties at risk from erosion or tidal flooding. The sailing club could be at risk from tidal flooding from the south-side.</p>	
PHB8	<p>Defence 681/2442 to Hamworthy Quay</p>	<p>This unit is largely low lying reclaimed land which is fronted by seawall, mudflats and a sandy beach which has previously been renourished at Hamworthy in the south. Net drift is from west to east with much of the beach material derived from the eroding cliffs at Rockley. A small section of coastline to the west end of the unit is undefended and is predicted to erode by 10m impacting on the carpark behind the shoreline. There are timber groynes at Hamworthy park beach backed by a concrete seawall, all of which have a residual life of approximately 8 years. The remaining frontage is backed by walled defence, most of which has a residual life of approximately 15 years and is under various ownership. At the very east end of the policy unit there is an undefended section of beach backed by grassland and a 615m long floodwall. This wall has a residual life of greater than 20 years, protecting the large residential area behind it. Assuming all defences are maintained sufficiently there should be minimal erosion along this frontage, although the beach at Hamworthy may need</p>	<p>All of the defences are expected to deteriorate within 20 years and as such would need upgrading in order to continue to provide sufficient protection to the surrounding properties. The timber groynes will need to be upgraded and the beach frontage renourished to keep pace with rising sea level. The undefended section of shoreline at the very west end of the policy unit would continue to erode unless defences are put in place to prevent this.</p>

		renourishment to maintain its current levels.	
PHB9	Hamworthy Quays	This unit consists of reclaimed land that has been heavily developed into a series of quays, marinas and commercial developments. The unit is entirely defended by concrete seawall and rock revetment with rock breakwaters protecting the marina in the southwest corner and another rock breakwater protecting a marina to the northeast within policy unit PHB11. Most of the concrete seawalls have a residual life of approximately 15 years; however the predicted life of the rock revetment is currently unknown. The concrete seawalls may need upgrading at the end of their predicted life in order to provide the necessary protection from sea level rise.	Provided the defences are upgraded at the end of their residual life there should be no risk to assets in the policy unit. If the defences are not upgraded in line with current sea level rise, by 2105 the whole policy unit will be at risk to flooding affecting numerous commercial developments and 302 properties.
PHB10	Holes Bay (E, N & W)	This unit contains Holes Bay, a large tidal harbour with a narrow entrance which is largely reclaimed land and developed in most parts. It is fringed by mudflat and saltmarsh with a railway line protected by embankments bisecting the bay in the north and a mixture of concrete defences and rock revetments to the east of the bay. These defences have a residual life of approximately 11-20 years. All defences will require upgrading in order to protect properties from tidal flooding and erosion by 2105, resulting in continued coastal squeeze to the fronting inter-tidal habitats.	
PHB11	Town Quay	A significant number of commercial and residential property has developed within this unit, as well as several quays and marinas situated along the shoreline. There is only a very small section at the eastern boundary that has any discernable beach frontage. The entire stretch of the unit is defended by vertical concrete seawalls. Additionally, the larger marina at the eastern end of the unit is protected by a rock revetment breakwater. Residual life of these hard structures is approximately 20 years, although the quay wall residual life to the north of Poole Bridge is currently unknown. Defences would require upgrading at the end of their residual life in order to protect approximately 1757 properties from flooding.	

PHB12	Parkstone Bay and Baiter Park	This unit consists of low-lying reclaimed land, with large intertidal mudflats. The majority of the unit is defended by rock revetments, with the exception of the eastern end which is defended by various stretches of wall. Most of this unit is relatively undeveloped with no risk to property from erosion within the next 100 years in this unit. Still, the existing defences require maintenance to protect 85 properties from flooding in 20 years time and 633 properties from flooding by 2105. Maintenance of the defences will cause coastal squeeze to the fronting inter-tidal habitats.
PHB13	Parkstone Yacht Club to Salterns Marina	This unit is heavily defended with various walls and revetments along the entire coastline, protecting both of the marinas and local property. Most of the defences have a residual life of approximately 15 years, with the exception of the defences on the southern edge of the lagoon. The lagoon is protected by a seawall which has a residual life of 3-8 years, after which the defence would need to be rebuilt. If all the defences within this unit are maintained according to sea level rise, then no erosion or flooding is predicted to occur within the next 100 years, consequently protecting 121 and 125 properties respectively, as well as both of the marinas, local property and infrastructure, as well as the sailing club located within the lagoon.
PHB14	Salterns Marina to Lilliput Pier	This policy unit consists of shallow sand and intertidal mudflats, with a small section of vegetated cliff rising to 18m from its southern boundary. The majority of the unit is fronted by various seawalls in private ownership, with additional rock revetment in the southern half of the unit protecting the base of the cliff. The residual life of the defence structures are approximately 3 years, after which the defences would need to be upgraded. If the current management strategies are maintained, there will be no risk to property from erosion or flooding, although the fronting inter-tidal mudflat will undergo coastal squeeze.
PHB15	Whitley Lake	PHB15 consists of inter-tidal mudflats and sandflats, sheltered from direct wave attack by the Sandbanks Peninsula. The seawall protecting the Luscombe valley region has a residual life of 1-5 years. The remainder of the seawall protecting the inside of the Sandbanks Peninsula has a residual life of approximately 6-10 years. All defences will require upgrade in the first epoch to prevent 9 properties, Shore Road and Bank Road from being at risk from erosion by the end of the last epoch, plus 141 properties from being at risk to tidal flooding. Upgrade of defences will cause coastal squeeze to the fronting inter-tidal mudflats and sandflats.
PHB16	Whitley Lake to North Haven Point	PHB16 comprises the northern perimeter of the Sandbanks Peninsula. Due to the sediment transport pathways operating, there are sand and gravel flood tidal deltas found immediately inside the harbour entrance. This unit has a seawall that runs along much of this coastline, with exceptions of the region in the vicinity of the marina. The south-eastern end of the unit, near to the harbour entrance, is protected by rock revetment. The defences have a residual life ranging between 1 and 10 years. All defences will require upgrade in the first epoch to prevent 37 properties, the marina, main roads and various landing piers from being at risk from erosion by the end of the last epoch in the far east of the unit, plus 188 properties from being at risk to tidal flooding.
PHB17	North Haven Point to Sandbanks Ferry Slipway	This unit stretches across the south-western tip of the Sandbanks Peninsula, flanking the entrance of Poole Harbour. The majority of the unit comprises no beach, with the only exception being south of the ferry slipway where there is a sandy, narrow beach. All tidal exchange occurs through this inlet generating strong ebb dominant tidal currents and sediment transport. The coastline is defended with rock revetments and a recurved seawall with a residual life of 1-5 years. These defences will require upgrade in the first epoch to prevent 5 properties from being at risk from tidal flooding by the end of the last epoch.

<p>PBY1a</p>	<p>Sandbanks Ferry to Bournemouth Boundary</p>	<p>This policy unit includes Sandbanks Peninsula which is a low lying sand spit, developed into a luxury residential area. This entire unit is heavily defended by a variety of structures. North of Shore Road there is a concrete groyne and a seawall protecting the cliffs. New rock groynes are in the process of being constructed between Branksome and Branksome Dene Chines. The rest of the spit is fixed in its current position by rock groynes, two short sections of seawall and a rock revetment at the southern most tip of the spit. The entire stretch of this unit has also undergone several beach replenishments, creating a wide sandy beach.</p> <p>Sediment is predominantly transported eastwards; however longshore transport processes become more complex along the spit. The movement of sand is not only affected by wave action but also Hook Sand and the East Looe flood tidal channel.</p> <p>Current defences will continue to provide protection in this epoch, although sediment replenishment will be required again in order to maintain beach volumes at Sandbanks Spit.</p>	<p>Defences in the western end of the unit will require significant upgrade and decadal replenishments will be necessary in order to prevent a breach and maintain the current shoreline position during these latter epochs.</p>
<p>PBY1b</p>	<p>Bournemouth Boundary to Point House Café</p>	<p>This policy unit has a high population density; therefore, there are a number of defence strategies in place. The entire 8.5 kilometres of beach frontage has a large concrete seawall and timber groynes at approximately 150-200m spacing, preventing erosion of the cliff line. In addition to the hard structural defences, there is also a long term replenishment scheme implemented, with several recharges and top-ups since 2005 to 2008. This has resulted in a large sandy beach along Bournemouth beach. The seawall and timber groynes in this policy unit have a residual life of less than 20 years. Defences would require upgrade in the 20-50 year epoch and replenishment would have to be sustained in order to</p>	

		protect the assets.
PBY2	Point House Café to Warren Hill	The majority of this unit is composed of gravel and sand, backed by a low-lying cliff on which sand dunes have formed. Coastal defences here consist of a combination of timber and rock groyne. In addition, the toe of the cliff around Double Dykes is defended by rock gabions. Sediment transport is from a westerly direction, therefore the recent recharges along the Bournemouth and Poole frontages, have led to an overall accretion of material in this policy unit. Erosion rates are identical to rates of erosion predicted under the no active intervention scenario for the eastern end of the unit, with no impacts on property and infrastructure. There is predicted to be 35m of erosion during the 0-20 epoch, 88m of erosion during the 20-50 epoch and 175m of erosion throughout the 50-100 year epoch. Defences will require upgrade when they reach the end of their residual life in order to prevent potential breaching through the lower topography at Double Dykes.
PBY3	Warren Hill to Hengistbury Long Groyne	The entire stretch of the policy unit is backed by the soft headland cliffs, fronted by a beach consisting of a combination of gravels and sands. This policy unit is largely undefended, with the Long Groyne situated at the easternmost end of the unit at Hengistbury Head. This intercepts the littoral beach drift from west to east around Poole Bay. Consequently material has built up west of the Long Groyne, creating a large accreting beach and sand dune system, which currently acts as a defence against erosion of the Headland. The Long Groyne will require upgrade at the end of its residual life in year 10. Assuming that replenishments within Poole Bay continue, therefore providing a continuous supply of material, cliff retreat rates will be reduced for the 300m section immediately west of the Long Groyne. Erosion rates are identical to rates of erosion predicted under the no active intervention scenario (35m in 20 years, 88m in 50 years and 175m in 100 years) for the remainder of the unit. There are no assets at risk.
CBY 1	Hengistbury Long Groyne to Tip of Mudeford Quay	<p>The current management for this spit is to maintain a fixed plan form position to prevent its elongation and landward transgression. The rock groyne and periodic recycling are required to keep the current spit width and reduce the possibility of a breach. At the same time the recycling works remove accreted material from the harbour entrance, thereby maintaining navigation for small vessels. Assuming the defences are maintained and re-profiling of the beach continues then erosion of Hengistbury Head and breaching of the spit should be negligible. The risk to tidal flooding would affect 2 properties and numerous</p> <p>Within 30 years there will be a requirement to review and upgrade all current defences along the spit if the current line of defence is to be maintained. Continued dredging of the harbour will be required in order to maintain the navigation channel and assist the draining of the harbour at low water. The periodic recycling of this dredged material will be paramount in preventing barrier rollover and breaching of the spit, particularly with sea level rise and increased storminess. Due to the relatively low level of the spit, the greatest risk to assets is from tidal flooding whereby 2 properties and numerous beach huts would be flooded by year 100.</p>

		beach huts.	
CHB1	Harbour Side of Mudeford Spit	<p>The harbour side of Mudeford sandspit is managed in the policy unit CHB1 but is largely reliant on the seaward side of the spit (CBY1) for its management policies. The unit is composed of fine mud and sand which is relatively stable due to the low current and wave activity within the harbour. There is a small section of revetment at the harbour mouth which has a predicted residual life of approximately 20 years and is used to stabilise the spit and provide some protection to the 'Black House'. There is also a section of rock revetment, approximately 200m in length, at the south end of the unit adjoining Hengistbury Head. This section has a residual life approximately 10 years but at present is situated in an area of very little change. The greatest risk posed to this unit is from tidal flooding whereby the majority of the spit would be flooded by a 1 in 200 yr event. This would affect 1 property and the majority of the beach huts along the spit. Present management activities include recycling works along the spit, which both maintains the level of beach material here and aids the removal of material from the tidal delta in order to keep it navigable.</p>	<p>Within 20 years the rock revetment is predicted to deteriorate and would need rebuilding and possibly extending to protect the tip of the spit from the effects of erosion and sea level rise. The tidal prism within the harbour would increase with sea level rise, encroaching on low lying marsh land.</p>
CHB2	Southside of Christchurch Harbour	<p>These policy units include the majority of Christchurch Harbour and largely consist of low lying marsh and mudflats. The marshes at Stanpit Marsh will gradually become more saline over this epoch. There are no assets at risk from erosion although there</p>	<p>During the 50-100 year epoch the risk to tidal flooding will increase to affect 3 properties within the</p>

CHB3	Stanpit and Grimbury Marshes	is one property at risk from tidal flooding over the next 50 years in CHB3.	harbour. Sedimentation within the estuary and on the tidal delta is likely to increase, although the tidal prism within the harbour will also increase in proportion to sea level rise. As a consequence there may be a need for additional defences within the harbour in particular around the golf course within CHB3, in order to protect the residential area to the north at Wick. All of the defences along Mundeford spit would need to be upgraded to prevent a breach of the spit and subsequent erosion of the saltmarsh behind it. Additional defences and continued beach nourishment schemes would be necessary along the Hengistbury Head frontage in order to prevent erosion of the low lying grassland at the south of the harbour.
CHB4	Mundeford Town Frontage	The northeast corner of the estuary consists of the policy units CHB4 and CHB5. These units are composed of estuarine mudflats backed by low lying residential land which is defended by various private defences, mainly walls with a residual life of approximately 20 years. The harbour entrance is protected by the Mundeford quay wall and a seawall on the east side. The quay wall is expected to have a residual life of approximately 10 years whilst the seawall is expected to last at least 20 years, after which it will require upgrade. The sea defences at Avon beach are predicted to deteriorate after 20 years and would need rebuilding in order to retain the present level of protection. These defences afford protection to many of the adjacent properties within CHB5. Assuming these defences are maintained to the same level of standard with sea level rise, the risk posed from erosion and flooding is considered to be negligible.	
CHB5	Mundeford Quay		

CBY2	Mudeford Quay to Chewton Bunny	<p>All defences will require upgrade in the first and second epoch in order to maintain the current line of defence. Assuming the defences are maintained, cliff line retreat would be prevented across the policy unit except for the undefended section of shoreline at Steamer Point. This area is predicted to retreat by approximately 2m in 0-20 years, 28m in 20-50 years, impacting on 10 properties and an additional 75m by 2105, impacting on an additional 11 properties and the southern edge of the golf course. This would gradually begin to form a localised embayment as the cliff recession accelerates relative to the defended stretches of coastline either side of it. This eroded material would be transported eastwards and may be interrupted by the rock groynes immediately to the east at Highcliffe, potentially benefiting the growth of beach here.</p> <p>No properties would be at risk to tidal flooding given upgrade of the defences protecting Mudeford Quay.</p>	
CBY3	Chewton Bunny to start of defence at Barton-on-Sea	<p>This policy unit is dominated by undefended soft eroding cliffs which periodically suffer from both marine and groundwater induced cliff slumps along the entire length of the frontage. The policy units either side of this unit are dominated by heavily engineered rock armour sea defences leaving the beach here starved of alongshore sediment. There is a sand and shingle beach fronting the cliffs, which is extensively submerged at high water leaving the cliff base vulnerable to wave attack. The principle erosion mechanism is mass movements due to the high clay content within the cliff which feed large volumes of material onto the back of the beach. Much of this fine material is carried offshore in suspension leaving behind shingle and sand deposits. Over the next 20 years the cliff line is expected to retreat by approximately 21m, affecting 10 caravans, chalets and lodges within the erosion zone. This is predicted to increase by an additional 32m within the next 20-50 years, affecting 1 property and up to 81 caravans, chalets and lodges with a further 224m of retreat between 50-100 years affecting a total of 262 properties and a total of 573 caravans, chalets and lodges by year 100. The breakwater at the western end of the policy unit is predicted to have a residual life of 15 years and would therefore require rebuilding to retain its effectiveness. The continued retreat of the cliff line over the next 100 years will begin to form an embayment as the Naish Holiday Village is eroded at a much faster rate than the presently defended shorelines of Highcliffe to the west and Barton to the east. No properties or assets will be at risk from tidal flooding.</p>	
CBY4	Start of defence at Barton-on-Sea to Barton Golf Course	<p>The coastline in this policy unit is heavily defended with rock armour revetment and rock groynes. The defences are designed to trap the alongshore drift of sediment and offer protection to the soft eroding cliffs. Assuming the present line of defence continues, the rock groynes may continue to intercept material from the rapidly eroding cliffs to the west in this epoch, which in turn would increase protection to the alongshore rock armour which will require upgrading in</p>	<p>The rock groynes would require maintenance or rebuilding at the start of this epoch in order to continue protection of the cliff base, in line with the supply of sediment from the west. The cliff top is predicted to continue to erode due to other processes and would require management to reduce or stabilise it. If stabilization measures are not implemented there could be a potential retreat of 53m to the west, whilst the central and eastern section would undergo between 27m and 39m. For the 50-100 year epoch, accelerated erosion at the west end could lead to a potential retreat of an additional 220m, whilst the central section of cliff could retreat by an additional 72m, increasing to 131m in the east of the unit. A total of 324 properties, 2 cafes, 2 hotels, a shop and public toilets would now be at risk of erosion by year 100.</p> <p>There is no risk from tidal flooding.</p>

		<p>10 years time. Still, erosion of the cliff top edge would continue to occur with a loss of up to 16m increasing to 22m at the western end due to cliff slumping, unless a management strategy is adopted to reinforce or stabilise the cliffs. This would potentially place 1 property, 2 cafes and a hotel at risk from erosion within the next 20 years.</p> <p>There are no properties at risk to tidal flooding.</p>	
CBY5	Barton Golf Course to Hordle Cliff	<p>This policy unit is backed by steep eroding sand and mud cliffs which gradually decrease in height and become more vegetated towards Milford at the eastern end of the unit. The cliffs are intersected by the Walkford Brook at Becton Bunny and comprise soft and highly erodible Tertiary materials. The upper beach in front of the cliffs is largely made of coarse shingle whilst the lower beach is a mix of sand and shingle. The shoreline along this unit is entirely undefended and vulnerable to erosion, particularly the soft cliffs to the western end of the unit. Sediment transport is from west to east, although the influx of sediment from the west is limited by the rock armour defences which protect Barton-on-Sea. Erosion mapping along this unit predicts the shoreline to have retreated between 8 to 29m during the 0-20 epoch, 28 to 43m during the 20-50 epoch and 72m during the 50-100 epoch affecting one property and the southern edge of Barton golf course. The coastline here will begin to form an embayment between Milford to the east and Barton to the west, assuming the present level of defence is maintained in both of these adjoining policy units. There are no properties at risk to tidal flooding along this unit.</p>	
CBY6	Hordle Cliff to Hurst Spit	<p>This policy unit is fronted by a mixed sand and shingle beach which varies in width above MLWS from approximately 40m in the east to 120m in the west. The majority of this unit is backed by seawall with additional rock armour protecting the central section and timber groynes along the eastern section at approximately 30m intervals. The direction of sediment transport along this unit is from west to east, however the numerous cross shore structures along this frontage act to reduce this transportation and stabilise the beach</p>	<p>Given that all defences are upgraded, there is no erosion predicted for the central and eastern end of the unit. For the undefended western end of the unit, an additional 50m of erosion is predicted during the 20-50 year epoch which will continue to erode the car park but not impact on property, with an additional 85m in the 50-100 year epoch which will impact on 164 properties.</p> <p>The rock armour defence in CBY7 will require upgrading in the 50-100 year epoch in order to continue protecting 146 properties located in CBY6.</p>

		<p>here. Towards the central and western end of the unit the beach is backed by eroding cliffs which are afforded some protection both by the beach and the seawall/revetment. All defences in this unit will need to be upgraded in this epoch. The undefended western end of the unit is predicted to retreat up to 16m affecting a number of beach huts and a car park. There are no properties at risk to tidal flooding over the next 20 years.</p>	
CBY7	Hurst Spit	<p>Continued sediment recycling from North Point would be required over this epoch to prevent the cross-sectional area from reaching alarm value. Not only would this maintain the navigation channel entrance to Keyhaven River but would ensure the spit continues to provide flood protection to the Western Solent coastal zone. Still, the spit would remain prone to overwashing, breaching and sluice overwashing processes under a high magnitude, low frequency storm event, therefore requiring emergency works to rebuild the spit structure.</p>	<p>During the 20-100 year epoch, the spit may require significant upgrade in order to prevent increased breaching and sluice overwashing. In addition, the lee of the spit would become more exposed to easterly wave attack given decline in saltmarsh extent. There would be no assets at risk given the line is held.</p> <p>The defence at Sturt Pond would also require significant upgrade in the 50-100 year epoch to protect 146 properties from flooding in CBY6.</p>