Exe Estuary

Flood and coastal erosion risk management strategy

Questions and Answers

Climate change impacts and predicted sea level rise

1. What is the likely level of future sea level rise around the Exe Estuary and how confident are you that these predictions are correct?

We have good confidence in the likely sea level rise over the next twenty years which is estimated as 100mm. By 2050, there is also confidence that we could experience over 200mm of sea level rise. Predictions vary because we don't know how many greenhouse gases will be emitted in the future and estimates suggest a range of sea level rise between 400mm and 1.7m over the next 100 years. The best estimate that is used in the strategy is that sea levels will rise locally by 700m by 2110. Ongoing local monitoring and forecasting will provide us with more evidence and if necessary the Strategy can be reviewed in the future to reflect any changes.

2. I have heard that storms are predicted to get more severe and to happen more often – but just how much worse and more often is likely?

Increases in wind speed, wave height and surge during storms are likely as a result of more energetic weather systems associated with climate change. However, it is difficult to quantify these changes based on current evidence.

3. What is the impact of strong winds on calm sea water levels in the Exe Estuary?

In addition to the effects of waves themselves, strong winds cause waves which can raise still water levels within the estuary by up to 0.1m. On the open coast this effect can be much greater. Low air pressure associated with high winds can also raise sea levels generally, resulting in tidal surge. These conditions are more likely to lead to wave overtopping of sea defences and coastal erosion.

Clyst Valley

4. What will happen to the Topsham to Clyst road if farmland is flooded in this area – won't it cause increased disruption to local residents and businesses?

We have been working closely with Devon County Council and other Environment Agency departments to confirm there would be no increase in flood risk to property or infrastructure, including to the road, if a large area of new habitat is created just upstream of the bridge. It is guaranteed that this potential risk would have to be mitigated before any permission would be granted. We are looking at options to improve flood protection to the road if and when a large area of new habitat is created in this area. This could be done by raising the road on a causeway or building new embankments. It is likely that improved protection to the road would only happen as part of a package of works in this area that include the creation of new habitat in the medium term i.e. after 2030. Sufficient funding would need to be found to deliver either option.

Dawlish Warren (see also Exmouth)

5. What will Dawlish Warren look like in the future if the Strategy's proposals are followed?

We have produced some images to help visualise the possible future changes, which you can see at our drop-in sessions. The exhibition also includes some historic images that show what the Warren looked like in the past, for example in the late 1940s after storms flattened the far 'hook' end. These give us a good indication of what the Warren could look like again in the future if it is shaped by natural processes.

6. When might Dawlish Warren spit be breached or flattened and how confident are you of this date?

Our best estimate is that the main body of the spit will continue to carry out its wave sheltering function over the next 100 years. The far 'hook' end of the sand spit is likely to breach and flatten out between 2030 and 2060. The shape of the Warren has changed continuously in the past and we have a long historic record of this. For example the 'hook' end was flattened in the 1940s after significant storms. This means that we have a good degree of confidence in how the Warren will behave in future in response to natural processes.

7. If your predictions show that Dawlish Warren will become less effective over time as a shelter for the inner estuary what additional flood defences will be needed elsewhere and when will these be built.

The strategy recommends that the existing estuary defences are improved to offset the impact of reduced shelter from the Warren in the future. This would generally require raising existing defences, rather than building completely new ones. This work has been included in our longer term recommendations, for example at places such as Starcross and Lympstone. We do not expect improvements to be needed before 2030 but the situation will be kept under review.

8. Previous studies have shown that it would cost three times as much to build new defences around the Estuary than to protect the existing defences to Dawlish Warren sand spit. What is the effect of a more natural Dawlish Warren sand spit on the rest of the estuary?

The value of the Warren providing shelter to the rest of the estuary is recognised for the near future. However, this sheltering effect of the sand spit cannot be relied upon long term because of predicted sea level rise. Continuing to defend the Warren is not sustainable in the long term, because of the high costs and the detrimental impact the defences are having on the quality of the sand dune habitat there. The Strategy recognises that at some point in the future there will be a need to improve defences elsewhere around the Exe Estuary.

9. What is the likely cost of the beach recharge?

Both the Exe Estuary Strategy and Teignbridge District Council's technical studies have identified short term costs of between £6.3M (for assessment and regular recharge/recycling of beach material onto Dawlish Warren and Exmouth beaches) and £8.4M (for a one-off recharge with 5 yearly recycling). However, this does not include costs associated with groyne maintenance.

10. Can we rely on dunes in the central section of Dawlish Warren sand spit if gabions are removed?

The proposed first phase of gabion removal is located where the dunes and landward levels are slightly higher (above Mean High Water Spring levels) than elsewhere. This will support the dunes slackening and moving landwards, and will reduce the possibility of regular, large scale inundation of the inner sand spit. The central section of the sand spit also has older, now inactive, dunes located around the golf course. These are wide and high and can be relied upon to continue to offer a high standard of protection from tidal flooding. In addition, it is proposed a new embankment is built across the Warren to reduce the risk of flooding to the amenity attractions and Dawlish Warren village.

11. How can you be sure that sand dredged from elsewhere and put on the beach at Dawlish Warren and Exmouth will stay there for any length of time?

The strategy recommends that a beach recharge and recycling scheme is undertaken. As and when this recommendation is agreed, further detailed studies will be carried out with the specific aim of designing the scheme so that sediment remains where it needs to be. This could involve the use of groynes, for example, which can help to keep sand in place. (See also the section on Dredging and Exmouth).

Dredging

12. Where will you dredge the sand from if the proposed beach recharge scheme goes ahead?

This still needs to be considered and will only be allowed after detailed study and a licensing process. It's possible that the sand will come from Pole Sands as the sand here is part of the Exe Estuary system and so matches in terms of type and size. This option would also reduce travel costs. Our draft Options Assessment Report considers possible dredging of material for the beach recharge scheme a number of sites - from Pole Sands, Bull Hill banks or the channel entrance. At Pole Sands the report concludes that the process of dredging and beach recharge could be designed to effectively work with the ongoing sediment transfers. At Bull Hill banks the report states that the process of dredging and beach recharge would tend to redistribute material away from the inner estuary, back to the coastal system. (See also the sections on Dawlish Warren and Exmouth).

13. Are there any benefits if dredging is restarted in the estuary?

Our technical work to date suggests that, if dredging is restarted in the estuary, depending on its scale, it could result in an increased loss of intertidal habitat. Under the Habitats Directive this would mean that additional sites would need to be identified around the Exe Estuary to create new habitat to compensate for that lost as a result.

Engaging with the Strategy

14. How do I find out about what the Strategy means for me and my community?

The draft strategy consultation document shows the main recommendations for every community around the Exe Estuary. The technical documents are also available online and these give more detailed information on how we have arrived at our recommendations and what has been considered.

Further information can be found on the Environment Agency Exe Estuary Strategy web pages at www.environment-agency.gov.uk/exe/estuary .

If you represent an organisation or community group and would like someone to come and talk with you please contact the Living with a Changing Coast Project Officer, Jane Lavick, by email at jane.lavick@environment-agency.gov.uk .

15. What impacts will the Strategy have on my business?

The Strategy could have a number of impacts on local businesses operating around the Exe Estuary – some positive and some less so. The Strategy seeks to find solutions which will protect the maximum number of people and properties around the Estuary from tidal flooding into the future, at the best cost and with the fewest impacts on the environment. We are speaking face to face with local farmers and tourism businesses that may be affected, but if you are unsure or concerned about the potential impact on your business please get in touch with us.

16. I would like a face to face meeting– who do I need to speak to?

We are holding three drop-in sessions at so you may like to come along to the most convenient session for you. These are open to everybody. You do not need to book and can come along at any time to view the exhibition or ask questions. Unfortunately we are not able to meet to discuss every individual concern but if you would like us to come and speak with your community, interest group or parish council please contact the Living with a Changing Coast Project Officer, Jane Lavick, by email at jane.lavick@environment-agency.gov.uk.

17. I would like to ask more detailed questions– how do I do this?

You can put your questions in writing to Martin Davies at the address below and we will aim to answer these within 20 working days.

18. How can I submit my comments, as I can't make it to any of the local meetings or drop in sessions?

You can send us your comments in a number of different ways. We would encourage you to use our e-consultation option if possible, as that reduces the need for paper or travel. You can find this at consult.environment-agency.gov.uk/portal/

Alternatively you can email your comments directly to martin.davies1@environment-agency.gov.uk

Or you can post written comments to us at :-

Martin Davies - Exe Estuary Strategy
Environment Agency,
Manley House,
Kestrel Way,
EXETER,
EX2 7LQ

Exeter

19. How will the proposed Exe Estuary Strategy impact on the flood defence scheme for Exeter, including the use of Exminster Marshes as flood storage for the Alphington Brook?

No impact is foreseen, as there is currently no need to realign tidal defences around Exminster/Powderham. This means that for the foreseeable future Exminster Marshes will continue to act as flood storage for Alphington Brook. The same consultants are working on both the proposed Exeter flood defences and the Exe Estuary Strategy so any impacts that do arise in future will be considered in a coordinated way.

Exmouth

20. Why are you considering taking sand from Exmouth and putting it on Dawlish Warren beach?

This is not what is planned. Teignbridge District Council are leading a technical study into the possibility of beach recharge. This means they are looking at whether beach material, such as sand can be brought onto beaches at Dawlish Warren and Exmouth to restore falling beach levels. Whilst this is not part of the Strategy it is a complementary piece of work as extra sand could make the beaches more attractive to users and it could also help to maintain the sheltering function of Dawlish Warren for longer into the future. (See also the sections on Dawlish Warren and Dredging.)

21. So where will the sand come from if the beach recharge goes ahead and how can we be sure that it won't increase flood risk to Exmouth?

A number of different options are being looked at currently. The best match in terms of sand is Pole Sands at the mouth of the estuary, as sand here now has come from Exmouth and Dawlish Warren beaches in the first place. Using a local source would also reduce the need to bring sand in from long distances. If Pole Sands is used it is estimated that less than 10% of the sand there would need to be removed for the beach recharge, so this is highly unlikely to increase flood risk for any coastal communities. Wherever the sand comes from its removal will be subject to a licensing agreement, which will consider likely impacts in more detail. See also the sections on Dawlish Warren and Dredging.

22. A proposed developer at Exmouth is being asked to raise floor levels by 1m. Would it not be better to protect the whole area, including existing neighbouring properties?

The option to provide new flood defences for this whole area has been identified and this would require local funding contributions.

Flood defence schemes

23. I can't see any real details about proposed new flood defence schemes in the Strategy – where can I find this information?

That's because the Strategy sets out the overall priorities for managing tidal flood risk into the future for the whole of the Exe Estuary and is only intended to give an overview. Whilst it highlights where improvements to flood defences may be needed it does not give details about exactly where walls will be built, how high or what materials will be used. All of these details will be considered at the next stage, when funding has been identified to build new local schemes. There will be opportunities for stakeholders and local communities to influence these details before building work starts, as has happened with other new flood defence schemes along the coast, such as at Shaldon and at Teignmouth.

Flood risk

24. Does the Strategy take into account fluvial and tidal risks in combination because the risks due to tide-lock are worse than from the tide alone?

The focus of the strategy is on tidal flooding but we recognise that many communities, such as Exton and Dawlish face a combined risk of flooding when surface water cannot drain freely into the Estuary because of high tides (tide-locking). The impact of tide-lock has been looked at but will need to be addressed in more detail for locations at risk at the next stage of the process, when the detailed design of potential flood defence schemes is considered.

25. What can be done to minimise local flooding caused by backing up of river water flows when there is a high tide and fresh water cannot drain into the estuary (tide-locking) ?

The problem is recognised at a number of locations around the estuary. Following the strategy, further studies will be carried out as necessary, for example at Clyst St Mary, to recommend ways to reduce this risk. This may result in improvements to flood defences to protect communities.

26. Have you assessed the impacts that the Strategy could have on critical infrastructure, such as hospitals, schools, roads, electricity substations, water and sewage treatment works?

The strategy has assessed the impacts on critical infrastructure, and has included the benefits within the assessment of options. Where possible, the benefits have been quantified. If this is not possible, the benefits have been described within the Strategic Environmental Assessment.

Funding

27. I've heard that although something is highlighted in the Strategy this doesn't mean that funding will be found to deliver it. If funding is limited which parts of the Strategy are most likely to be funded?

There is a need to look at this and the opportunities for co-ordinating funding between partner organisations. Communities with larger populations, where more people and more properties are at risk are more likely to receive national funding than elsewhere, as the cost to benefit ratio will be lower. It may become increasingly difficult to continue to provide flood defences for very small settlements, isolated properties and farmland. In addition to national funding money can come from through Local Authorities, the South West Flood and Coastal Committee's local levy [raised through County and Unitary Authorities] and from local contributions.

28. How will funding for the Strategy be co-ordinated, and how can everyone be made to pay?

We will use the existing partnerships, led by the Environment Agency, to provide coordination of programmes across flood and coastal defence operating authorities.

29. What is included in the cost-benefit analysis and how is this undertaken?

The cost-benefit analysis follows government guidance for Flood and Coastal Risk Management. It takes account of household, environmental and other benefits including disruption to businesses, transport and other infrastructure. It is based on a calculation of damages that would occur with and without a coastal defence scheme, and the costs of providing the scheme.

30. What are the options to generate additional finance which could be used to pay for new or improved flood defences locally?

This is called partnership funding and may come from local authorities, developers and others who will benefit.

31.How is funding secured to deliver the proposals identified in the Strategy?

National funding is based on the level of benefits that proposals provide. Other contributions may be essential for the proposal to proceed if national funding is insufficient. The Environment Agency will work in partnership together with local authorities to identify funding for necessary schemes.

32. Who decides on the priorities for spending on flood and coastal defences and which schemes go ahead first?

Government sets the policies that determine how much national funding is available and how this will be allocated according to the outcomes (benefits) that schemes provide. The Environment Agency manages the allocation of national funding. Since funding will generally rely on both national and local partnership funding, both can affect priority.

Habitats

33. Why do you need to create areas of new habitat around the estuary – it seems like birds are protected more than people?

The natural environment helps to makes the Exe Estuary special, so we need to protect both people and the habitat for wildlife. New habitat is needed because coastal defences can 'squeeze' existing intertidal habitat. The technical work behind the Strategy has estimated how much intertidal habitat (egg saltmarsh, mudflat, sand dune) will be lost in the future due to coastal squeeze i.e. the area that will be drowned out at high tide in the Exe Estuary as a result of the sea level rising against built flood defences. Because the habitats of the Exe Estuary are protected under UK and European law we have to ensure that the area of intertidal habitats is not reduced over time. This means that the Strategy has to identify sites where suitable new habitat could be created, before it is actually lost. This is a complex issue because the Exe is a relatively small estuary. We are speaking with landowners whose land may be suitable for new habitat to seek their agreement before progressing.

Railway

34. The future of the mainline railway (Exeter – Penzance) is crucial to the rest of the South West. Is the commitment to the line still there from Network Rail?

Network Rail are partners in the development of the Exe Estuary Strategy and have helped to develop the draft recommendations. They have said that they are committed to keeping this line open and are working with us to agree a programme of future flood defence improvements and necessary investment which will continue to protect the railway and communities behind it, such as Starcross.

35. How can we find out where local culverts run under the railway line into the estuary and how these are maintained?

Network Rail has this information and should be able to give it to any communities that need it. Following on from a stakeholder event Starcross Parish Council have already met with Network Rail officers on site to discuss maintenance of culverts underneath the track.

36. As the mainline railway is a piece of strategic infrastructure how can we access financial contributions from further afield to ensure its longer term maintenance and upkeep?

The strategy recognises that the mainline railway is a piece of strategic infrastructure, and has wider regional benefits. However, the economic case to maintain and improve the railway against flooding is strong enough based on local benefits.

37. If sea level rise predictions are correct what improvements will be needed to the railway line to continue to protect properties behind it from high tides and storms, as at Starcross?

The railway lines around the estuary currently have a high standard of protection against tidal flooding and damage from storms, with the exception being the coastal reach from Dawlish and westwards. It is not expected that improvements would be required until after 2030, dependent on sea level rise.

Sailing

38. How will the Strategy affect sailing and navigation in the Exe Estuary?

The coast will continue to evolve and adapt naturally as it always has done, with or without a strategy, and this can affect navigation as the position of channels and sandbanks changes in the estuary. The strategy will enable the continuation of the existing sailing and navigation in the Exe Estuary. After 2030, as and when the Dawlish Warren sand spit evolves, there may be changes at the estuary mouth. At this point navigation may need to be changed, but the impacts on sailing should be minimal. The exception to this would be during storm events, where the sand spit would offer less protection than now.

Tourism

39. How have the impacts on tourism been considered in the cost benefit analysis performed as part of the Strategy?

The impacts on tourism have been included qualitatively in the Strategic Environmental Assessment. The impacts have also been considered in the cost-benefit analysis, but are not used to support national funding of schemes.

40. How will the beaches and tourist facilities at Dawlish Warren and Exmouth be affected by the proposals in the Strategy?

The strategy recommendations for both Exmouth and Dawlish Warren will either maintain or improve the beaches and tourism facilities. At Exmouth, the recommendation is to recharge the beach to ensure it keeps pace with sea level rise and this will require local funding. At Dawlish Warren, the recommendation is also to recharge the beach to ensure it keeps pace with sea level rise. This will also involve the removal of the rock filled baskets (gabions) that are reducing the aesthetic value of the beach and the quality of the sand dunes. These actions should help improve the amenity value of the beach.

What happens next and delivery

41. Who agrees the strategy and what happens next?

After we have considered all comments from the public consultation, a final version of the Strategy will be submitted to the coastal operating authorities, and other partners including Natural England, for agreement. The agreed Strategy will then be submitted to the Environment Agency nationally for approval.

42. When will we see real action or changes actually happening on the ground as a result of this Strategy?

Delivery of coastal defence schemes that are within an agreed Strategy can be streamlined because they have been agreed by all partners involved in principle. Some potential improvement works are already being considered, so when the Strategy is agreed these can be progressed rapidly. However we will still need to undertake detailed design and they will still need to be agreed locally.

18 January 2013