Coastal Communities 2150 Adaptation Plan For the Community of Yarmouth January 2014











hotos Courtesy of Yarmouth Harbour ommissioners





Part One - Introduction

1.1 Scope of the Coastal Adaptation Plan

This Coastal Adaptation Plan outlines some proposed solutions to achieve the long term vision of the community. These could help the community adapt to future change, thereby reducing negative consequences and enhancing beneficial consequences of climate or coastal change.

"There are a lot of little things we can do, however behaviour change is not keeping pace with the environmental changes." Yarmouth Community member on community drop-in day.

Benefits of a Coastal Adaptation Plan for the Community			
It establishes meaning and gives hope for the future			
Motivation for individuals to consider their activities and actions			
It brings unity to community			
It raises commitment level/ownership			
It brings positive change			
Potential to capitalize on new opportunities			
Benefits of planning rather than reacting			

The format of this plan is as follows:

- Introduction
 - The Stakeholder Engagement Process
- The Vision
- The Adaptation plan (including the Action plan)

1.2 Background to the project

<u>CC2150</u>

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Coastal Communities 2150 (CC2150) Project started in January 2011. The project partners put together a successful bid to the INTERREG 2 Seas Programme and we were awarded European Regional Development Funds to cover 50 per cent of the €2.9 million costs. The partners involved are: Environment Agency, Kent County Council, Hampshire County Council, Alterra (Stichting DLO), Province West-Vlaanderen and Agency for Maritime and Coastal Services – Coastal Division.

The aim of the partnership was to work together, sharing experiences and learning to enhance knowledge on how to best communicate the long-term issues of changing coastlines. This is something that will be greatly impacted by future climate change; especially rising sea levels, accelerating erosion rates, higher storm surges and rainfall. Increased air and sea temperatures will bring additional challenges, as will pressures to build new developments and homes.

Partners have worked with selected pilot areas to develop innovative tools and ideas to help communicate these issues to communities at risk. The over-arching aim was to involve those impacted by change in the decision-making processes as engaged people will be much better placed to deal with future risks and changes.

CCATCH The Solent

Hampshire County Council (HCC's) chose 6 sites for Community Engagement after a short-listing process conducted with members of the HCC's Project Overview Group.

The sites selected include the following:

- 1. Beaulieu to Calshot an area with a small number of large private landowners and includes Calshot Activities Centre and Lepe Country Park (Engagement occurred here within the HCC pathfinder project.
- 2. Southampton, Upper West Itchen an area of mixed urban community with social housing, private landlords and owner occupiers. There are also numerous commercial waterside properties.
- 3. Netley and Royal Victoria Country Park a small urban coastal community and a Country park which draws numerous recreational visitors.
- 4. Solent Breezes Holiday Park an area with a holiday park with some permanent residents, holidaymakers and numerous recreational uses, also includes farmland and utilities infrastructure.
- 5. Langstone a small rural community with tourist and recreational assets at risk.
- 6. Yarmouth small affluent town with a working harbour.

A detailed Project Initiation Document was produced for each site and checked with the Project Overview Group. This document detailed the background to the project, the reason the site was selected and the issues due to coastal change.



Yarmouth (Coastal Change Yarmouth)

The Community Engagement in Yarmouth has been managed by the Solent Forum and a Local Engagement Group was set-up to guide the project. The Project was called Coastal Change Yarmouth.

The aims, objectives and deliverables of the project are as follows:

Aim

Community of Yarmouth to be aware of and able to manage risks from coastal flooding.

Objectives

- To further the work of the Yarmouth Coastal Defence Working Group (YCDWG) in raising awareness of flood risk in the town, and to agree approach on presenting flood risk information.
- To understand current awareness and raise awareness of the current risks to different sectors of the community. To engage with existing groups where possible.
- To support and encourage Yarmouth Town's Community Flood Plan.
- To take forward a whole range of interim measures to protect the town including flood gates and small walls, other resistance measures and resilience measures, as proposed by the Yarmouth Coastal Defence Working Group.

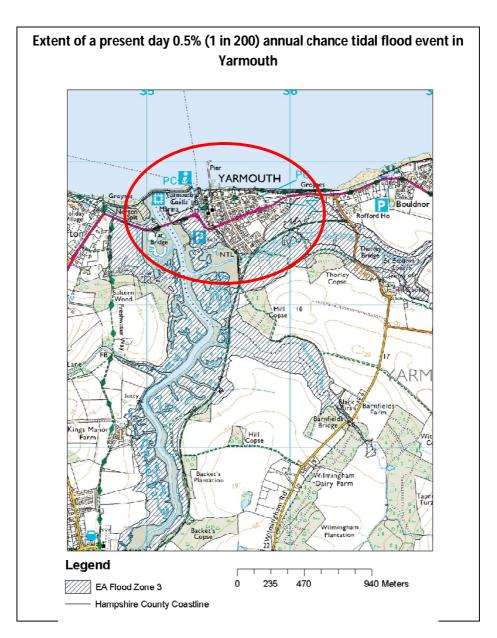
 To provide educational and interpretational opportunities that can communicate coastal change and build a high level of understanding within the local community.

Deliverables

- Community involvement in an Adaptation Plan for the short (up to 20 years) and longer term (20 years+), agreeing an overall vision for managing risks.
- To leave a practical legacy that is permanent and repeatable.

1.3 Our understanding of the current situation

The project focused on the town itself extending to Thorley Brook and the following map shows the boundary of the area.



A summary profile of the area and community includes:

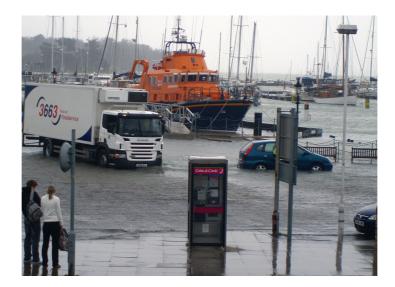
- Up to 65 properties fall within the 1:1000 flood zone (The majority within the 1:200 zone)
- All of these properties are within a small area of the town and most of them are commercial properties, especially services to the town including pubs, shops, restaurants, accommodation etc.
- Landowners affected by flood risk
- Recreational space and public facilities are affected
- Yarmouth Harbour facilities
- Wightlink facilities
- The Castle
- People that use all of the above facilities
- Intertidal and estuarine habitats

This is an area at high risk of flooding from the sea and the Western Yar estuary. The community are already quite engaged, and the Yarmouth Town Council and Yarmouth Harbour Commissioners have set-up a working group, with others, to progress plans to defend or adapt to flood risk in the town.

1.4 Coastal Change and Adaptation

1.4.1 Climate Change (Sea Level Rise)

Sea level rise is considered to be one of the most significant effects associated with climate change to threaten the UK. Sea levels have been rising for thousands of years since the last ice age and will continue to do so in the future due to the thermal expansion of sea water and melting of the polar ice caps. Scientists predict that by 2100 sea levels will rise by up to 1m in the English Channel, and that they will continue to rise for the next several hundred years. It is plausible that we will get 3.5 m rise in 300 - 400 years and even a 10m rise in the next 1000 years. With a predicted rise in the number of storms, the risk of flooding and erosion of land along the coast will increase.



A report by the Yarmouth Coastal Defence Working Group in December 2010, entitled Adapting to Coastal Flooding in the Yarmouth Area in 21st Century, provided estimates of Sea Level Rise in Yarmouth over the next 50 years based upon Defra guidance in 2006. This figure amounts to 27 centimetres between 2010 and 2050. These figures have been used for the engagement and in particular in the flood model.

Yarmouth is suffering from coastal change as flooding is set to become more frequent and deeper as sea levels rise. On March 10th 2008, flooding affected properties and amenities in the town, as a high tide of 3m combined with a 1.1 metre tidal surge. The water rose above the harbour wall, covered the bus station and the car park, reached the square and went a little way up the high street.

1.4.2 Planning for future change

As a response to climate change the primary mechanism over the last 20 years has been that of mitigation and in particular a reduction in greenhouse gas emissions has been and is at the forefront of the environmental and political agenda. Whether mitigation can be effective or not, it is imperative that communities and Government respond to the threats of climate change through the alternative process of adaptation.

Numerous definitions may be cited with regard to the nature and meaning of *adaptation*. The United Nations Development Programme (UNDP) report on Adaptation Policy Frameworks, Lim *et al.*, (2004) state "adaptation is a process by which strategies to moderate, cope with and take advantage of the consequences of climate events are enhanced, developed and implemented"

Adaptation in the context of this report can be seen as a process of becoming adjusted to new conditions, in a way that makes individuals, communities or systems better suited to their environment.

An adaptation strategy must look beyond the short term and be based on a long term vision. It needs to take into account the dynamic nature of coastal processes, particularly in the light of climate change. Adaptation presents many challenges as to how to continue to deliver services and maintain infrastructure, and at the same time there will be considerable opportunities, such as potential improvements and the enhancement of landscape and nature conservation.

In the long term it is unlikely that we will be able to maintain all areas of the coast as they are today; so it is important to think realistically about what the coastline could look like in future, consider more sustainable solutions and plan for these changes and adapt.

Part Two - The Stakeholder Engagement Process

2.1 Local Engagement Group

The Yarmouth (LEG) includes key representatives of the local community at risk of coastal change. Members have been chosen to represent different interests of the town at risk. The LEG will help guide the local programme of activities and provide local expertise, knowledge and advice.

Members of the Yarmouth Engagement Group included the following

- Sue Hawley (Isle of Wight Estuaries Officer)
- Sylvia Mence (YCDWG and previously Yarmouth Town Council)
- Chris Lisher (Yarmouth Harbour Commissioners and YCDWG)
- Tim Francis (Yarmouth Harbour Commissioners, resident)
- Veronica Workman (Business and resident)
- Cllr Stuart Hutchinson (Isle of Wight Councillor)
- Alan Toms (Yarmouth Sailing club and resident)
- Jon Matthews (Wightlink)
- Karen McHugh (Solent Forum)
- Anita van Mil (Solent Forum/Resources 4 Change)

2.2 The Stakeholder Engagement Strategy

A Stakeholder Engagement Strategy was produced in January 2013, and agreed by the Yarmouth Engagement Group.

The strategy sets the scene and describes how the engagement will take place. More specifically it provides an outline of the engagement, a timetable, the activities that will take place, tools that will be used and the key messages. It also lists who should be involved and provides a stakeholder analysis. The strategy is a living document and is used throughout the engagement to evaluate the engagement, providing sections on logging activities and monitoring and review.

2.3 Tools

The following tools were used and they are fully discussed in section 2.5 results:

- Local Engagement Group meetings
- Interviews with key stakeholder in the town
- Creation of a flood visualisation tool
- Working with the primary school on an educational project and an art project
- Newsletter
- Mail drop of letter and information leaflet
- Two community drop-in days

2.3 Methodology

The following table provides a broad timetable showing the project methodology.

Action	Lead	Start Date
Stakeholder mapping	ССАТСН	Autumn 2012
Arrange and set up LEG	IWC and YCDWG with input from CCATCH	Autumn 2012
Engagement Strategy	CCATCH Project Officers with help from LEG	December 2012
Meeting Yarmouth primary school	Solent Forum	21 st November 12
Interviews with key members of the community	R4C Anita van Mil	December 12
Design and produce information /advertisements	LEG/ CCATCH Project Officers/Anita van Mil	January 2012
Advert/provision of info. about project	LEG/ CCATCH Project Officers/Anita van Mil	February 2013
Community drop-in day to raise awareness, to provide tools to visualise change	LEG/ CCATCH Project Officers/Anita van Mil	Spring - Summer 2013
Working with Yarmouth Coastal Defence Working Group to develop the vision	LEG/ CCATCH Project Officers/Anita van Mil	Autumn 13
Innovative ways of helping the community interpret flooding- Art, Flood Visualisation, website information	LEG/ CCATCH Project Officers/Anita van Mil	Summer 13
Working with the school – Educational Programme and art project	LEG/ CCATCH Project Officers/Anita van Mil	Summer 13
A drop-in event to summarise Adaptation Plan and invite comments, with a Final Newsletter	LEG/ CCATCH Project Officers/Anita van Mil	January 14
Final adaptation plan and vision	LEG/ CCATCH Project Officers/Anita van Mil	Autumn 2013

2.5 Results

Community Engagement

The Project team first contacted the community in February 2013 by distributing a leaflet and letter to 65 properties in Yarmouth that are within the tidal flood plain. At the same time an advert was placed in the Isle of Wight Beacon to explain the project. A number of interviews were also held with community members and businesses in the floodplain. A number of responses were received and subsequently these respondents were invited to a public drop in event at Yarmouth Town hall on 19th June. The event was advertised locally as well as in the Beacon.



The aim of the drop in day was to raise awareness of the project and the role the community can play in increasing the towns' resilience to flooding in the long term. The event was attended by approximately 80 people and provided the following:

- An introduction to the project
- A presentation from Yarmouth Primary School children on their six week programme of work about sea level rise

- Information on the work of other local initiatives such as the Yarmouth Coastal Defence Working group and the Yarmouth Community Flood Plan
- A demonstration of property level flood protection measures from the National Flood Forum in their mobile van
- A flood visualisation model, projecting a flythrough of three flood scenarios on a continuous loop

The event was attended by the Isle of Wight Press who wrote an article on it. An evaluation of the event showed a great deal of interest in the project and especially in the flythrough flood visualisation film. For some community members the event was an eye opener: 'The event made me aware of the possible threat to Yarmouth and surrounding area'. For others it was a confirmation of what they already knew: 'Official' confirmation of previous knowledge'. One visitor expressed the relevance of coastal change for the future of Yarmouth: 'This is going to be one of the most important aspects of our lives in the future'.

The evaluation report and the flythrough film can be found on the project webpages. <u>http://www.solentforum.org/current/CCATCH/Yarmouth/</u>

In September 2013 the Community were sent a Newsletter to explain what the project was about, and in particular to explain that the next stage of the project was to prepare an adaptation plan in which they would be involved.

In September and November a draft Adaptation Plan was drawn up with the Yarmouth Coastal Defence Working Group and with the Local Engagement Group and other interested community members.

A summary of Yarmouth's Adaptation Plan will be available at a legacy event being held in the Harbour Commissioner's Office in March 2014. A final Newsletter will also be produced and disseminated to summarise the whole project and inviting comments on the Adaptation Plan.

The Flood Visualisation Model

The flood visualisation model was commissioned by the project and built by Channel Coastal Observatory. The model uses 2013 Environment Agency data including surveyed heights of defences, showing probabilities of flooding using high resolution Lidar data to represent the land surface for the flood simulations and flythroughs.

The flythroughs visualise three water level scenarios as specified by the Yarmouth Coastal Defence Working Group. Scenario 1 provide Mean High Water Springs, and scenarios 2a and 2b replicate a similar level of flooding to that observed during the 10 March 2008. Scenario 3 provides a model of what scenario 2 may look like if sea levels rise 27cm by the mid century.

The flythrough film can be found on the project webpages. <u>http://www.solentforum.org/current/CCATCH/Yarmouth/</u>

Yarmouth Primary School learning all about flooding

The Project team contacted the Yarmouth Primary School in November 2012 and after two meetings planned an educational programme with two classes of children. The older 7-9 years olds had a detailed educational programme on flood risk and the younger under sevens an art programme based on the effects of sea squeeze. The programme with the 7-9 year olds involved an intensive 6 week programme of lessons for two hours per day between May and June of this year. The programme was designed to help the children understand what flood risks there are in Yarmouth and how we can respond to them. The materials are available for download from the project webpages.

http://www.solentforum.org/current/CCATCH/Yarmouth/

An evaluation of the school project is available for download from the project pages. The children enjoyed working on different activities. Asked about what they had learned responses ranged from 'I have learnt about how flooding happens' to, 'I have learnt what to do if your house ever gets flooded' and 'I learned lots of new words like fluvial and pluvial also I learned about the flood in 2008 and what happened to people's houses'.

Parents and carers learned a great deal too. '*I've learned a lot reading all the materials she brought home*', said one mum and a grandparent said, '*It's what I know already, however very good it's coming from a younger generation*'.

The school children and teacher presented the work of the school at the June drop-in day to their parents and the public, with the press present.



Yarmouth Primary School art work in the Sea Squeeze Project

Natural Enterprise were commissioned by Hampshire County Council to work with 23 children (under 7 year olds) at Yarmouth Primary School and their teacher on an art project which would encourage the children to think more about climate change and sea level rise. Natural Enterprise commissioned Isle of Wight artist Ecclestone George to do the work. Ecclestone George worked with the school between 11th June and 18th July 2013 over seven sessions.

Project Legacy: Website Resource and Historical Flood Marker

The project would like to leave a lasting legacy. We have established a project website which shows all of the work undertaken, including the flood visualisation model. Early in 2014 an historical flood marker will be installed near the quay in Yarmouth; this will show where flood in occurred in March 2008.

Adaptation Plan

A meeting was held with the LEG on 7th November to draft the adaptation plan. A vision for the community was expressed using material from the project and an outline action plan.

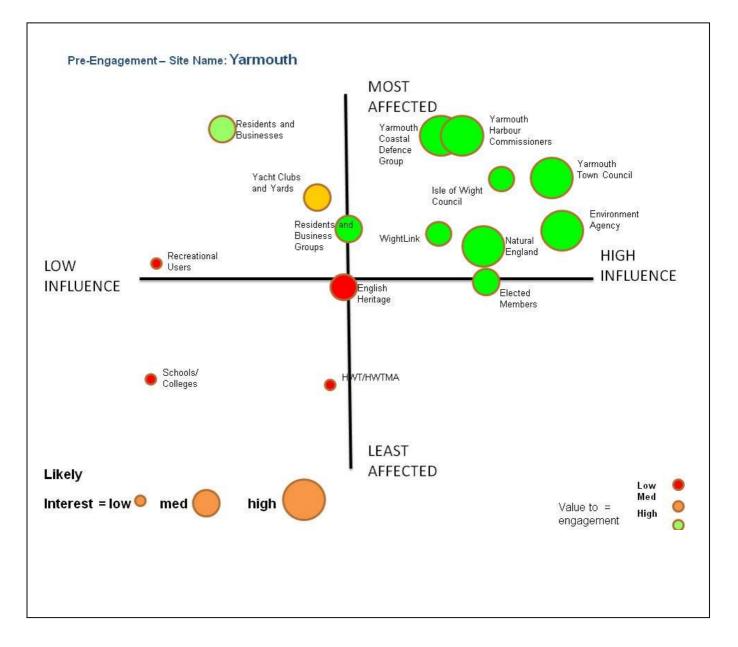
The Adaptation Plan and the final project outputs will be shown to the Community at an open day on March 13th 2014 at the Harbour Office. This will be followed by a final Newsletter.

Working with the Local Engagement Group

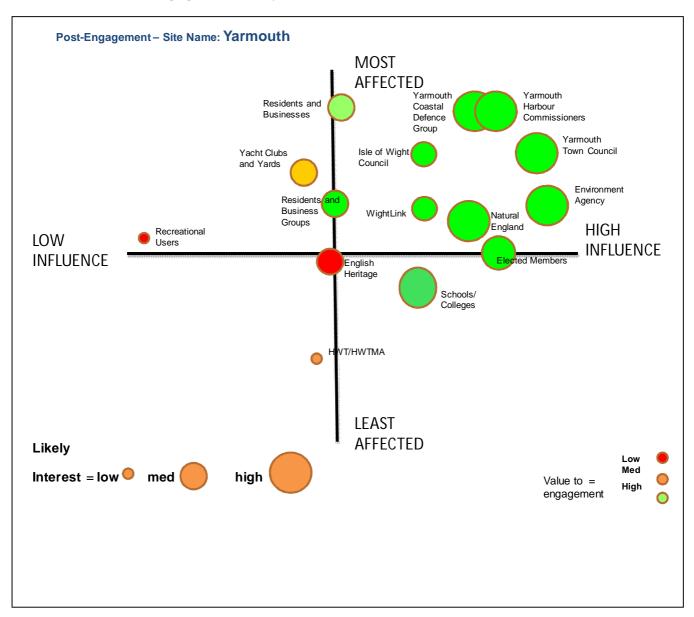
The Local Engagement Group guided the project from beginning to end. Seven meetings in total were held.

2.6 Pre and Post Stakeholder Analysis

2.6.1 Pre Engagement Analysis



2.6.2 Post Engagement Analysis



Part Three - The Vision

3.1 What is a Vision

A Vision describes the preferred future scenario or gives an image of the future the community seek to create. Definitions of a vision could include the following:

Aspects of a Vis	sion		
Provoke emotion	Motivational	Longterm	
	ward thinking	0	
Unique Values	Where they w	ant to be in the future	
Principles	Inspiring		
About Coastal Adaptation	Realistic	Challenging	
Visionary	Aspira	ations	
Lessons from the past			
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3.2 how was the Vision Defined

A meeting was held with the Yarmouth Coastal Defence Working Group (YCDWG) in September 2013, and with the group an outline vision was drafted. This draft was then taken to a Coastal Change Yarmouth Local Engagement Group meeting on 7th November, to which the wider community were invited; a facilitated workshop was held in order to shape the vision. A final community event was held on March 13th 2014 to outline the vision and adaptation plan with them and obtain their input.

3.3 The Vision for Yarmouth.

At a LEG meeting on 7th November, a draft vision emerged using material from the project. This vision is as follows:

To help ensure the community of Yarmouth is able to adapt to tidal flooding now and in the future, so as to protect themselves from the effects of tidal flooding, whilst maintaining the character of the town. In particular to create wide awareness of the risks and options for protection including coastal defences and property level protection.

Part Four – Adaptation Plan

4.1 Introduction

This section summarises the key pressures, issues and opportunities for the community. These are discussed and the range of proposed solutions for the short, medium and long term that have been suggested are outlined. A table summarises the proposed solutions for action. The section also considers legacy issues.

The Adaptation plan has at its core the plans of the Yarmouth Coastal Defence Working Group. The actions from their report entitled "Adapting to Coastal Flooding in the Yarmouth Area in the 21st Century, December 2010" have been updated by the group and included.

4.2 Key Pressures / Issues /Opportunities

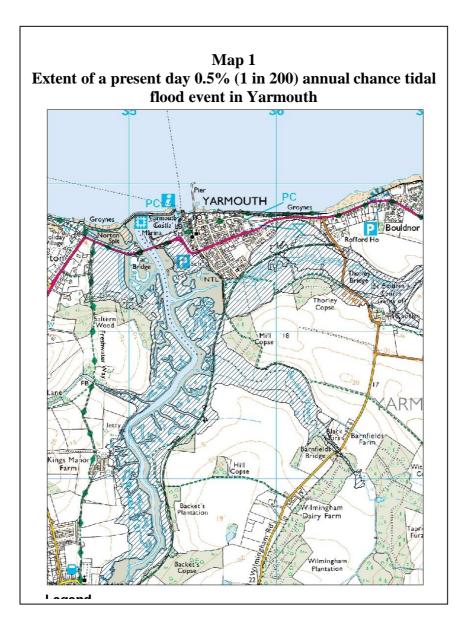
4.2.1 Scenarios/options

Future climate change and the impacts this has get more and more uncertain further in time. This has to be taken into account in decision making in order to develop a system that will remain functioning under a range of conditions and is therefore flexible. A sustainable adaptation plan therefore needs to be robust and able to adapt over time to (unforeseen) future conditions. As such the adaptation plan should include the following:

- several options that can be kept open that explore a range of scenarios and options that could occur due to a variety of uncertainties.
- connect short-term targets to long-term goals over time.
- commit to short-term actions while keeping options open to take account of uncertainties.
- continuously assess and take actions if necessary.
- Set indicators/triggers for change e.g. level of sea level rise, peak surge tide level, condition of flood defences.

Yarmouth is an area at high risk of flooding from the sea and the Western Yar estuary. The community are already quite engaged, and the Yarmouth Town Council and Yarmouth Harbour Commissioners have set-up a working group called the Yarmouth Coastal Defence Working Group to progress plans to defend or adapt to flood risk in the town.

The combination of storm surges with high spring tides already causes occasional flooding in the Yarmouth area. Rising sea levels in the coming century will make such flooding more frequent and more severe. The current EA Flood Zones appear to completely encircle the town (see map 1). This potentially presents serious problems relating to access and egress routes for existing and proposed development and emergency planning. In the event of the 1 in 1000 year tidal event, flooding may affect over 60 properties (36 within the 1:200 year tidal event), as well as open space facilities, harbour facilities and a number of roads and thus becomes an emergency planning consideration. Flooding from the sea will have the most significant impact in the west of the town, where the topography is flattest and close to sea level.



The Isle of Wight Shoreline Management Plan sets a policy of Hold the Line for Norton Spit to the west of the town and for Yarmouth town. The cost benefit for the town itself is fairly good, however it is likely to be dependent on private contributions and there have been options presented which may link any new scheme with a replacement or upgrade of the outer breakwater of the harbour. The Western Yar estuary itself has a policy of No Active Intervention. Thorley Brook which joins the Western Yar from the east has a long term policy of managed realignment followed by an approach of no active intervention. The detail of any scheme needs to be worked-up within a coastal strategy and the West Wight Coastal Defence Strategy started many years ago by the Isle of Wight Council is still on hold.

The Coastal Change Yarmouth team met with the Yarmouth Coastal Defence Working Group at the very beginning of the project and they were keen to be involved. The group have already produced a report entitled "Adapting to coastal flooding in the Yarmouth area in 21st century" December 2010 (A summary of this report can be see on the Yarmouth Harbour Website (see below)). A summary leaflet was distributed to 5,500 homes.

http://www.yarmouth-harbour.co.uk/news/coastal-defence-report/

The report above and an update provided to the Coastal Change Yarmouth project has formed the building block for this adaptation plan. The Coastal Change Yarmouth project helped the community understand how they could adapt to flood risk prior to any scheme that may be implemented, as well as help them understand how they can contribute and thus bring forward a flood risk scheme to protect the town.

The adaptation plan considers the following epochs:

- Short term adaptation (up to 2020)
- Medium term adaptation (2020 20490)
- Long term adaptation (2050 and beyond)

The scenarios considered show an increase flood risk, forecast conservatively at additional 300 cm by 2050. In 2008, properties in the town suffered increased tidal flooding, and should forecasts be realised there will be deeper and more extensive flooding to the town as shown in the flood visualisation model.

4.2.2 Key Areas for Adaptation

The following points underlie this adaptation plan.

- Adopt the Yarmouth Coastal Defence Working Groups (YCDWG) Proposed Solutions in its 2010 Report, updated in 2013.
- YCDWG will take forward this adaptation plan. Please contact the YCDWG (via the Yarmouth Harbour Master) to obtain more information on the YCDWG and how and when it intends to implement actions
- The Yarmouth Coastal Change project has demonstrated new ways of engaging the public and YCDWG has been asked by Coastal Change Yarmouth to consider how to involve the public in its work in the future. So far the YCDWG has published a 28 page Report and also a leaflet that was distributed to 5,500 households.
- YCDWG will take over the monitoring of the flood marker and the flood visualisation model.
- An update of the YCDWG proposed solutions can be found below showing potential practical solutions as well as actions regarding the community flood plan. Timing will need to reflect better scientific prediction and actual experience of sea level rise as well as Government economic priorities to meet these risks.

The adaptation plan references the wider Isle of Wight Shoreline Management Plan 2011, which sets the following policies for coastal defence.

- Norton Spit: Hold the Line
- Yarmouth: Hold the Line
- Thorley Brook & Barfields Stream: long term Managed Realignment followed by No Active Intervention
- Western Yar Estuary: No Active Intervention

BY 2020

Awareness and Planning

- Community flood plan includes resistance & resilience advice for property owners, such as flood boards for business/house doors. Launched October 2013. Plan will be extended in line with sea level rise and coastal erosion. Over 80 properties invited to register at this stage
- Monitoring the Flood Visualisation model
- Monitoring the town Flood Marker
- To encourage Yarmouth Primary School to continue raising pupil awareness of coastal change.
- Work with the National Flood Forum in the future to demonstrate property level protection ideas and obtain help on community flood planning

Proposed Practical Solutions

- Gates 0.5 metres high in lanes which lead from High Street to the shore (six). Height based on individual land levels.
- Gate at Pier entrance
- Gates on harbour slipways (four)
- Flood boards for house doors
- Supply of flood prevention equipment to key areas at Bridge Road and Quay Street entrances into the town centre
- Raise wavebreak on Norton Spit by one or two planks
- Reinforce sea wall at western end of the Common

By 2050

Proposed Practical Solutions

- Gates on Bridge Street and Quay Street entrances into the town centre
- Sluices on overflow pipes to prevent ingress of water through drains
- Raise wavebreak on Norton Spit by half a metre
- New breakwater one metre higher than existing breakwater
- Raise pier by one metre
- Raise Gossips cafe by one metre
- Raise ferry pier, linkspan etc by one metre
- Raise river bank around the Green by one metre
- Raise gate to Thorley Brook
- Reinforce Causeway at Freshwater, allow use as a ford.

BY 2100

Proposed Practical Solutions

- Raise A3054 road by one metre, including the swing bridge
- Reinforce revetments on road
- Raise utilities under road
- Norton Spit No further expenditure
- Raise quay wall by one metre
- Raise sea wall by one metre on north side of the Common to protect the main road to Newport
- Install gates to one metre at harbour slipways and lanes
- Raise old railway footpath by one metre and reinforce to act as riverbank
- Install raised bank on South side of Yarmouth close to Thorley Brook to protect properties
- Allow ingress of water to land on both sides of River over this fifty year period as sea level rises.
- Replace the Causeway at Freshwater.

4.3 Legacy Ongoing communication

The Yarmouth Coastal Defence Working Group will lead on these proposed solutions. They meet regularly to discuss flood defence options and funding.

Please contact the Yarmouth Harbour Master, at the Harbour Office to obtain information about the group.

Harbour Office, The Quay, Yarmouth, Isle of Wight PO41 0NT UK Tel: +44 (0)1983 760321 Fax: +44 (0)1983 761192 Email: info@yarmouth-harbour.co.uk