



A Climate Emergency:
Flood Defences
for the Future

Pressure on the government is mounting, we need to find a more resilient and cost-effective way to mitigate the impact of flooding.

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Executive summary



Mark Robinson, Scape Group chief executive

Latest data from the UN's Disaster Risk Reduction Office suggests at least 250 million people are now affected by flooding around the world¹. The UK has seen an increase in flooding, with at least one major incident every year for the last nine years. The recent devastation caused by Storm Ciara and Storm Dennis brings home to many communities the very real impact of climate change on our day to day lives. Pressure on the government is mounting, we need to find a more resilient and cost-effective way to mitigate the impact of flooding.

The Environment Agency is working to highlight the significant risk that flooding creates for the UK's infrastructure and communities. In the 21st century, an increasing number of homes will be on land with high flood risk, caused by a more permissive planning system that allows more developments to be built on flood plains, together with the rapid erosion of our coastlines and more extreme rainfall events. In less than 50 years, the number of homes under threat in England is forecast to double to five million².

Although the government has acknowledged the escalating crisis, our analysis demonstrates that there has been a limited real terms increase in funding, over the last decade.

It reveals that whilst historically, expenditure has increased in real terms from £802m in 2009/10 to £870m in 2018/19, there has been limited growth in the revenue expenditure that enables our existing infrastructure to be maintained.

It is especially concerning to see that revenue expenditure has barely risen over the last ten years, with real term growth of just £3 million. Much of our water infrastructure is from the Victorian era, more than a hundred years old and desperately needs to be maintained and upgraded.

Every £1 we invest in flood protection schemes saves us £5 in property damages³. Given the clear monetary benefit of upfront investment in flood protection, we need to be proactively funding more projects. However, the solution is not just to secure additional funding. After years of budget cuts and austerity, government funding for local authorities has become increasingly limited.

The public sector is no stranger to the challenges of competing pressures on the limited resources we have at our disposal. We need to think critically about how we work together more effectively; harnessing the knowledge of our industry experts and collaborating to operate across local authority boundaries to deliver essential infrastructure.

The recommendations put forward in this report aim to provide workable solutions to more efficiently enhance flood defences; protecting more homes, businesses and communities, despite the funding challenges.

We need to be operating more creatively and innovatively, whilst taking inspiration from the flood defence strategies other countries implement. Our ability to work collaboratively will be vital to delivering projects rapidly and effectively. Shared resources are invaluable, and we need to work across administrative boundaries with our neighbours to address this national issue.

Every £1 we invest in flood protection schemes saves us £5 in property damages³

5%



Winters in the UK, for the decade 2009-2018, have been on average 5% wetter than 1981-2010 and 12% wetter than 1961-1990⁴.

30 years

In 30 years, England will experience annual heatwaves like the summer of 2018⁶.

10 warmest

The 10 warmest years in the 140-year record have all occurred since 2005, with the six warmest years being the six most recent⁵.

47%



Our summers are forecast to become even drier, with average rainfall expected to decrease by up to 47% over the next 50 years⁸.

35%



Our winters are forecast to become even wetter, with 35% more precipitation expected by 2070⁷.

Flood

¹ 2013 floods a "turning point", United Nations Office for Disaster Risk Reduction, 2013

² Long Term Investment Scenarios, Environment Agency, 2019

³ Long Term Investment Scenarios, Environment Agency, 2019

⁴ UK Climate Projections: Headline Findings, Met Office, September 2019

⁵ Scientific Consensus: Earth's Climate is Warming, NASA

⁶ Extreme weather and global warming: Here's what the UK can expect if emissions keep increasing, The Independent, 13th March 2019

⁷ Ibid

⁸ Ibid

Our Recommendations

We have put together a series of recommendations for the construction industry, policymakers and local government to help implement more efficient and effective ways of addressing the impact climate change is having on our inland and coastal flood defences.



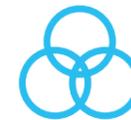
A 45%* increase in Flood and Coastal Erosion Risk Management Funding for England

The financial benefit of upfront investment in flood defences is undeniable. Combined with the physical and mental devastation extreme weather causes for people in affected communities, this provides a strong argument for increasing funding for the Environment Agency by 45% over the next six years. In addition, budgets for local authorities should be ring-fenced so that vital flood defence work is undertaken, not only in terms of new infrastructure, but improving the quality of existing assets. Although local authorities are under significant pressure to deliver services with constrained budgets, climate change is one of the biggest threats facing the country and it needs to be a priority for both central and local government.



Increased collaboration between local authorities

The partnership model, which is being used effectively in parts of England, should be further developed and implemented across the country. Local authorities combining resources and working collaboratively to deliver flood protection schemes and coastal erosion projects provides clear, tangible efficiencies, such as those being delivered by Coastal Partnership East. Councils in the same area face similar challenges. Working in partnership gives them the ability to mobilise a well-resourced team, harnessing the relevant skills and expertise to plan and efficiently deliver projects that are urgently needed.



A holistic view of flooding types to drive cohesive and robust flood protection strategies

The three types of flooding we have highlighted within this report are regularly viewed, and dealt with, in isolation. We urgently need to take a more holistic approach to assessing the impact of climate change, with all parties including Lead Local Flood Authorities (LLFAs), water companies and the Environment Agency working in collaboration. The approach being advocated by Coastal Partnership East of working with partners to create cohesive and robust flood risk strategies that counter the impact of our changing climate should be replicated, not only on the coast, but across inland flood protection authorities as well.



Adopt innovative approaches that utilise natural flood protection methods

As the impact of climate change becomes increasingly evident, we need to be responding with more innovative approaches and solutions, sharing best practice and taking a lessons-learned approach from the flood protection strategies implemented in other countries. The reality is that storm surges and flash flooding are only going to increase, and we need to learn to live with the water, rather than fighting against it.

Dean Banks
Chief Executive Officer,
Balfour Beatty,
UK Construction Services



“Recent years have seen increasingly frequent and devastating floods across the country. The construction and infrastructure industry mitigate flood risk by building defences and implementing resilience measures. And when extreme weather hits, we are a critical part of the response: getting the roads, buildings, bridges and other affected infrastructure back to work to ensure that communities can recover as quickly as possible.”

“But there is more to do. Engaging the construction and infrastructure industry earlier and proactively before flooding happens can help reduce the risk and make the clean-up run more smoothly. We also need more partnership working between local authorities, and a more strategic, longer-term funding approach for flood and coastal risk management. The price of flooding to local communities – and to the wider economy – far outstrips the cost of building and maintaining effective flood defences and resilience measures.”

*The recommended 45% increase in funding was calculated based on the government's commitment to increase funding to £4bn over the next six years, but there being an urgent requirement to increase annual funding for flooding to over £1bn plus inflation annually.

Types of flooding

Three forms of flooding have been investigated in detail by the Environment Agency to build up the risk profile across the country for the government.

These three types – coastal, river and surface water – have been included in the national risk register to help the government identify, assess, prepare for and deal with emergencies associated with flooding and severe storms⁹. Each type of flooding has been individually assessed and scored, based on the likelihood of occurring and the expected severity. Other forms of flooding do occur in England, such as groundwater and sewer flooding, but these have not been included in the Environment Agency's risk register.



River flooding:

River flooding occurs when the water level in a river, lake or stream rises and overflows, affecting the surrounding land.



Surface water flooding:

Surface water floods are created by extreme rainfall or overflow from a drainage system.



Coastal flooding:

Coastal floods are a result of storm surges and high tides, which force water up over coastal barriers and submerge low-lying land along the coast.

How we fund flood protection schemes in England

Funding for flood and coastal erosion risk management (FCERM) comes from a variety of sources, including central and local government. Central government funding is provided via the **Environment Agency** in the form of **Flood Defence Grant in Aid (FDGiA)** from the **Department for the Environment, Food and Rural Affairs (DEFRA)** and the **Ministry of Housing, Communities and Local Government (MHCLG)**.

Additional funding sources are also raised by the Environment Agency through their levy on local authorities, partnership funding, drainage boards and direct funding from local authorities. DEFRA retains funding for ad-hoc programmes and provides resources to **LLFAs**. From 2013/14, a proportion of funding from DEFRA for LLFAs was transferred over to MHCLG. Since 2016, all funding for LLFAs has come from the MHCLG.

The Environment Agency splits its funding streams into capital and revenue. Capital refers to funding used for implementing new and improved schemes, whilst revenue is used to maintain our existing assets and infrastructure.

LLFAs – (Lead Local Flood Authorities)

LLFAs were created under The Flood and Water Management Act 2010, which requires county councils and unitary authorities to manage local flood risks by working collaboratively across the Risk Management Authorities in their area.



Funding in England

In real terms, annual expenditure on FCERM has increased by £68m between 2009/10 and 2018/19, from £802m to £870m. A spike in 2014/15 saw it jump up by £200m on the year, to £934m. There was also an increase in capital spending in 2014/15 following the extreme floods over winter 2013/14, when more than 5,000 homes and businesses were flooded, thousands of households lost power and people lost their lives¹⁰.

Recent research suggests the budget for flood protection needs to increase to reach over £1bn annually plus inflation in the next ten years to ensure we are adequately protecting our communities and coastlines.

The 2007 floods cost £3 billion and resulted in an extra 185,000 insurance claims¹¹. Prevention ultimately saves money in the long-term by reducing the catastrophic damages incurred by extreme weather events.

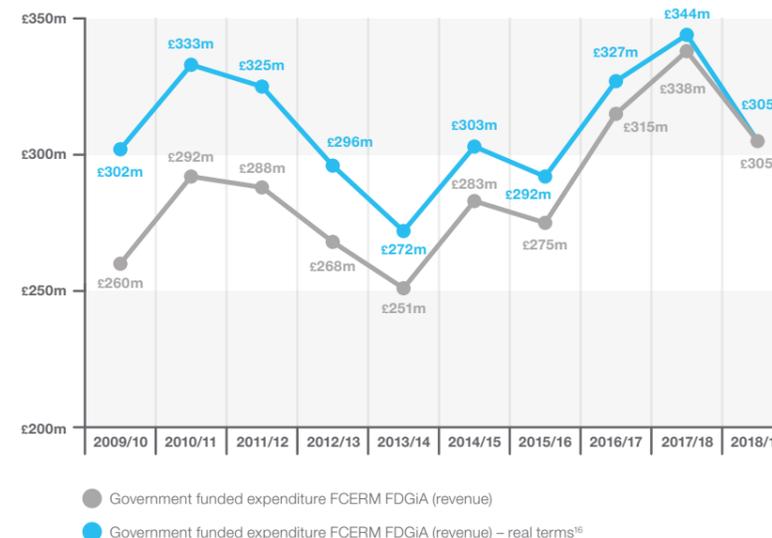
Expenditure on flood and coastal erosion risk management 2009/10 to 2018/19

Year	Government funded expenditure FCERM FDGiA (revenue)	Government funded expenditure FCERM FDGiA (capital)	Expenditure funded by charges / levies / other income – FCERM/LL/ PF/ Other income	Core DEFRA retained funding (including resources paid to LLFAs)	MHCLG (resources paid to LLFAs)	Total	Total – real terms ¹²
2009/10	£260m	£360m	£57m	£13m	-	£690m	£802m
2010/11	£292m	£360m	£48m	£19m	-	£719m	£821m
2011/12	£288m	£261m	£51m	£24m	-	£624m	£703m
2012/13	£268m	£269m	£48m	£39m	-	£624m	£689m
2013/14	£251m	£315m	£71m	£19m	£21m	£677m	£734m
2014/15	£283m	£467m	£68m	£33m	£21m	£872m	£934m
2015/16	£275m	£391m	£75m	£25m	£20m	£786m	£835m
2016/17	£315m	£447m	£82m	£2m	£31m	£877m	£911m
2017/18	£338m	£402m	£79m	£3m	£32m	£854m	£870m
2018/19	£305m	£453m	£78m	£2m	£32m	£870m	£870m

Whilst overall expenditure has increased in real terms over the last decade, revenue funding has seen minimal growth between 2009/10 and 2018/19. Increasing by just £3m in real terms, from £302m in 2009/10 to £305m by 2018/19. Over this time, revenue expenditure, which goes towards staff and office costs as well as maintenance of existing assets, fluctuated from a low of £272m in 2013/14 to a

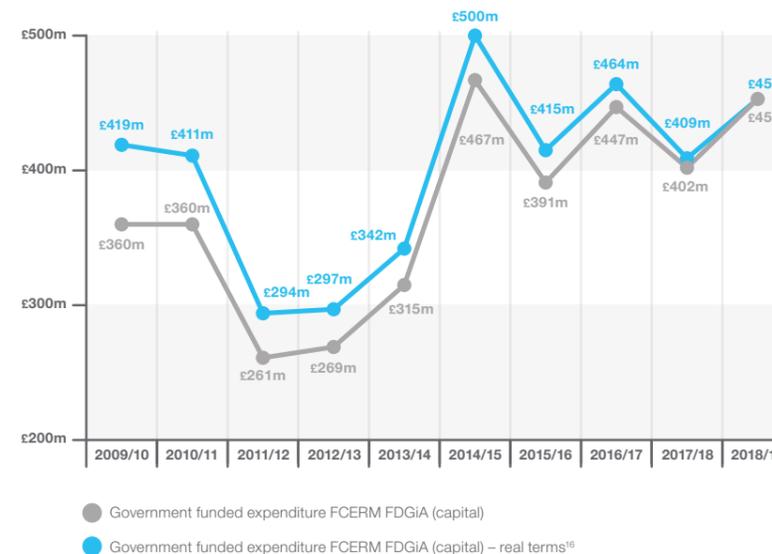
high of £344m in 2017/18. In the 2009/10 spending review, DEFRA received some of the biggest cuts to their budget, directly impacting the amount of funding available for flood protection schemes¹³. We urgently need to increase funding for revenue, to ensure that our existing watercourses are sufficiently maintained to keep rivers flowing and prevent flooding.

Revenue expenditure by the Environment Agency on flood and coastal erosion risk management 2009/10 to 2018/19



As part of our analysis, we also looked at how much the Environment Agency has spent on capital projects in real terms. We found that it has only increased by £34m since 2009/10. Given the increasing frequency of major flooding incidents and the associated evidence of rapid changes to our weather patterns and coastlines, there is a significant requirement for the provision of new infrastructure. For this to be delivered, capital spending, as a preventative measure against floods that can devastate our coastal communities, also needs to increase. We will need to see more extreme infrastructure solutions to combat the threat of rising sea levels and reduce the impact of extreme rainfall. Recently a Dutch scientist has suggested damming in the entire North Sea to protect northern Europe – a huge project that highlights the type of radical thinking required to mitigate against rising sea levels¹⁵.

Capital expenditure by the Environment Agency on flood and coastal erosion risk management 2009/10 to 2018/19



£3m

Revenue funding has seen minimal growth between 2009/10 and 2018/19, increasing by just £3m in real terms

£34m

Increase in expenditure on capital projects by the Environment Agency in real terms since 2009/10



£3bn

The 2007 floods cost £3 billion

185,000

The 2007 floods resulted in an extra 185,000 insurance claims

¹⁰10 key moments of the UK winter storms, The BBC, 17th February 2014

¹¹Flood Funding, House of Commons Environment, Food and Rural Affairs Committee, March 2013

¹²Real term figures are shown in 2018/19 prices, using HM Treasury's GDP deflator (December 2019 publication)

¹³Spending review: 'Greenest government ever' reserves worst cuts for Defra, The Guardian, 20th October 2010

¹⁴Real term figures are shown in 2018/19 prices, using HM Treasury's GDP deflator (December 2019 publication)

¹⁵Climate crisis: Plan to dam entire North Sea could protect millions from rising oceans, The Independent, February 2020

¹⁶Ibid

Regional contributions

to flood and coastal erosion risk management

Our analysis also reviewed local authorities' expenditure as well as their contributions to the Environment Agency through local levies, over the last four years.

Local authority outturn data for the years 2015/16 to 2018/19 shows the amount of funding allocated to flood or coastal erosion risk management from their Settlement Funding Assessment. The data shows that inland areas, such as the West Midlands, are consistently spending less than regions that have large expanses of coastline and/or several lakes or rivers. For example, in 2018/19, local authorities in the West Midlands spent £1.74 million on flood protection, compared to the average £15.16 million spent by local authorities in

the East of England, where one fifth of the region is below sea level¹⁷ and the soft-sediment of the coast increases the risk of coastal erosion¹⁸. Another area of England that has experienced the effects of climate change is Yorkshire, where local authority spending has been consistently higher than in other regions, at £18.85 million in 2015/16, £21.71 million in 2016/17 and £20.76 million in 2017/18 in real terms, although this has dropped to £14.91 million in 2018/19.

While local authorities across London have the lowest direct contribution towards flood and coastal erosion risk management, they make the highest contribution towards the Environment Agency.

Our analysis also looked at local levy contributions made towards the Environment Agency from local authorities across England. These levies are calculated based on the land mass, flood risk and number of people in the area for each local authority.

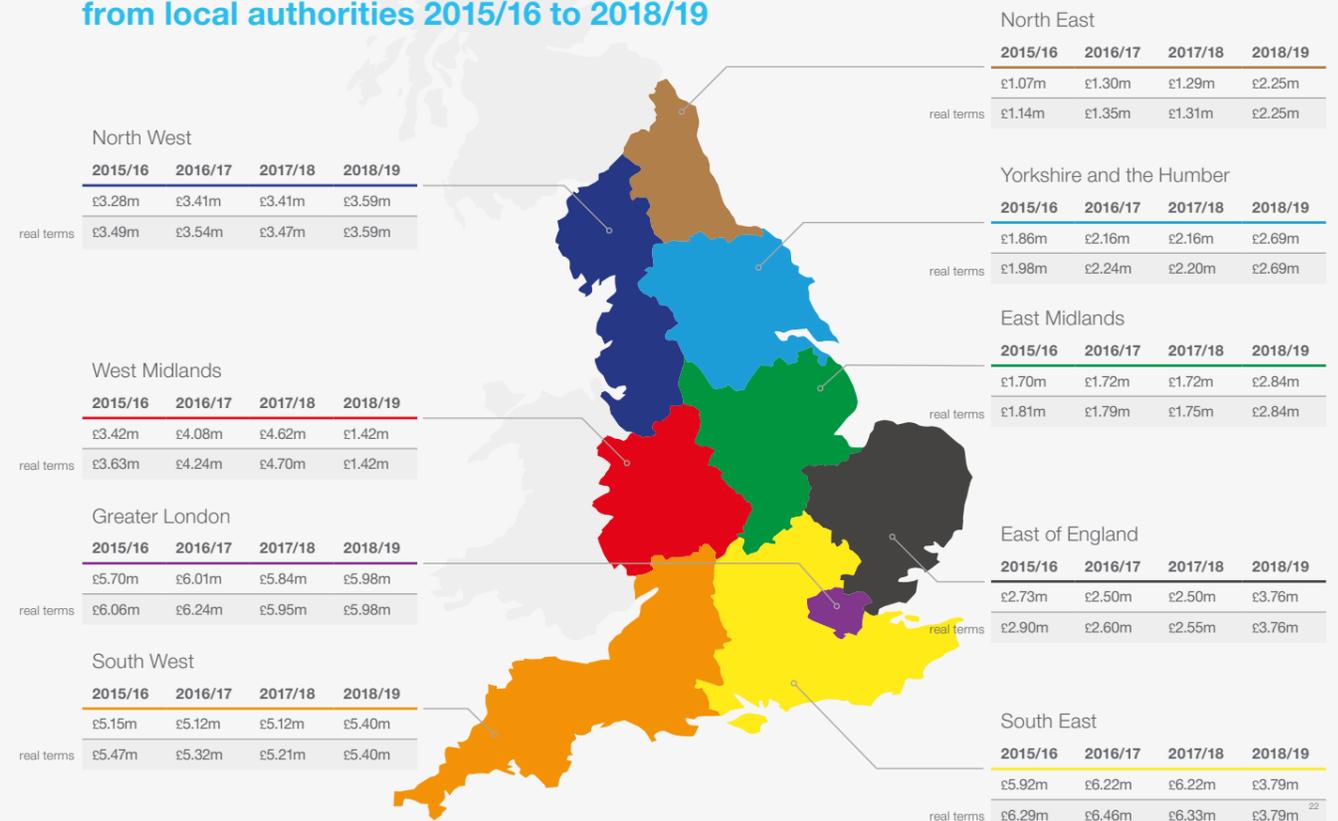
While local authorities across London have the lowest direct contribution towards flood and coastal erosion risk

management, they make the highest contribution towards the Environment Agency. London is vulnerable to flooding from several sources including tidal, river, surface, sewer, reservoir and groundwater²⁰. The Environment Agency owns and operates the Thames Barrier, which provides one of the highest levels of flood protection in the world, protecting thousands of homes and commercial property, worth over £200 billion²¹.

Local authority outturn data for 2015/16 to 2018/19 showing contributions towards flood and coastal erosion risk management

Region	2015/16	2015/16 real terms	2016/17	2016/17 real terms	2017/18	2017/18 real terms	2018/19	2018/19 real terms ¹⁹
North East	£4.02m	£4.27m	£6.05m	£6.29m	£5.51m	£5.61m	£3.26m	£3.26m
North West	£5.56m	£5.91m	£5.84m	£6.07m	£5.71m	£5.81m	£6.71m	£6.71m
Yorkshire and the Humber	£17.74m	£18.85m	£20.9m	£21.71m	£20.39m	£20.76m	£14.91m	£14.91m
East Midlands	£14.44m	£15.34m	£15.43m	£16.03m	£16.6m	£16.90m	£16.28m	£16.28m
West Midlands	£2.78m	£2.96m	£2.93m	£3.04m	£2.36m	£2.40m	£1.74m	£1.74m
East of England	£14.1m	£14.98m	£14.91m	£15.49m	£14.26m	£14.52m	£15.16m	£15.16m
South East	£12.5m	£13.28m	£12.19m	£12.66m	£11.45m	£11.66m	£12.84m	£12.84m
South West	£12.76m	£13.56m	£12.62m	£13.11m	£11.13m	£11.33m	£11.79m	£11.79m
Greater London	£3.97m	£4.22m	£3.02m	£3.14m	£2.09m	£2.13m	£1.24m	£1.24m

Environment Agency local levy contributions from local authorities 2015/16 to 2018/19



¹⁷A Summary of Climate Change Risks for the East of England, Climate UK, 2012

¹⁸Climate change 'will wreak havoc on Britain's coastline by 2050, The Guardian, 2011

¹⁹Real term figures are shown in 2018/19 prices, using HM Treasury's GDP deflator (December 2019 publication)

²⁰London Environment Strategy, GLA, May 2018

²¹Ibid

²²Real term figures are shown in 2018/19 prices, using HM Treasury's GDP deflator (December 2019 publication)

Spotlight on Coastal Partnership East: A best practice solution

Coastal Partnership East was formed in 2018 by combining resource and expertise from four coast protection authorities – Suffolk Coastal District Council, Waveney District Council, Great Yarmouth Borough Council and North Norfolk Council (in April 2019, Suffolk Coastal District Council and Waveney District Council combined to create East Suffolk Council).

The Coastal Partnership East is an innovative approach to managing 92km of the 173km of coastline in Norfolk and Suffolk, from Holkham in North Norfolk to Landguard Point in Felixstowe. They work closely with the Environment Agency, the Water Management Alliance and coast and estuary community partnerships along the coast.

The local authorities work together to implement robust initiatives and bring a long-term focus to addressing coastal erosion and coastal flooding, combining a team of experts, including planners, engineers, technical specialists, IT support, community engagement and funding experts, to assess risks, identify funding and deliver solutions more efficiently.

Karen Thomas,
Head of Coastal Management
at Coastal Partnership East



“The main benefit of Coastal Partnership East is the wealth of skills and expertise that are brought to the table by the three councils working collaboratively. We operate as boundary blind, which allows us to take a broader approach to addressing flood risks. While we focus on coastal flood management, we are also able to take a holistic view and have projects underway that manage all three types of flood risk. This makes more sense to the local community too; the general public doesn’t differentiate between flood types and we are able to consult with them from within our team and present an overarching strategy.

“The partnership works particularly effectively because our coastline has a combination of rural and urban areas. This combination means that there is a requirement for a more varied skillset, which we have in-house and are able to mobilise quickly.”

Regional Flood and Coastal Committees were created under the 2010 Flood and Water Management Act, which was introduced following the widespread flooding in 2007. These committees are formed of representatives from LLFAs who take decisions on where capital funding is allocated, as well as monitoring the delivery performance of the Environment Agency and local authorities that deliver defence works.

In the case of Coastal Partnership East, the three councils (North Norfolk, Great Yarmouth and East Suffolk) use their LLFAs (Norfolk County Council and Suffolk County Council) who are members of the Anglian (Eastern) Regional Flood and Coastal Committee to ensure funding for their projects is allocated by the committee.



92km

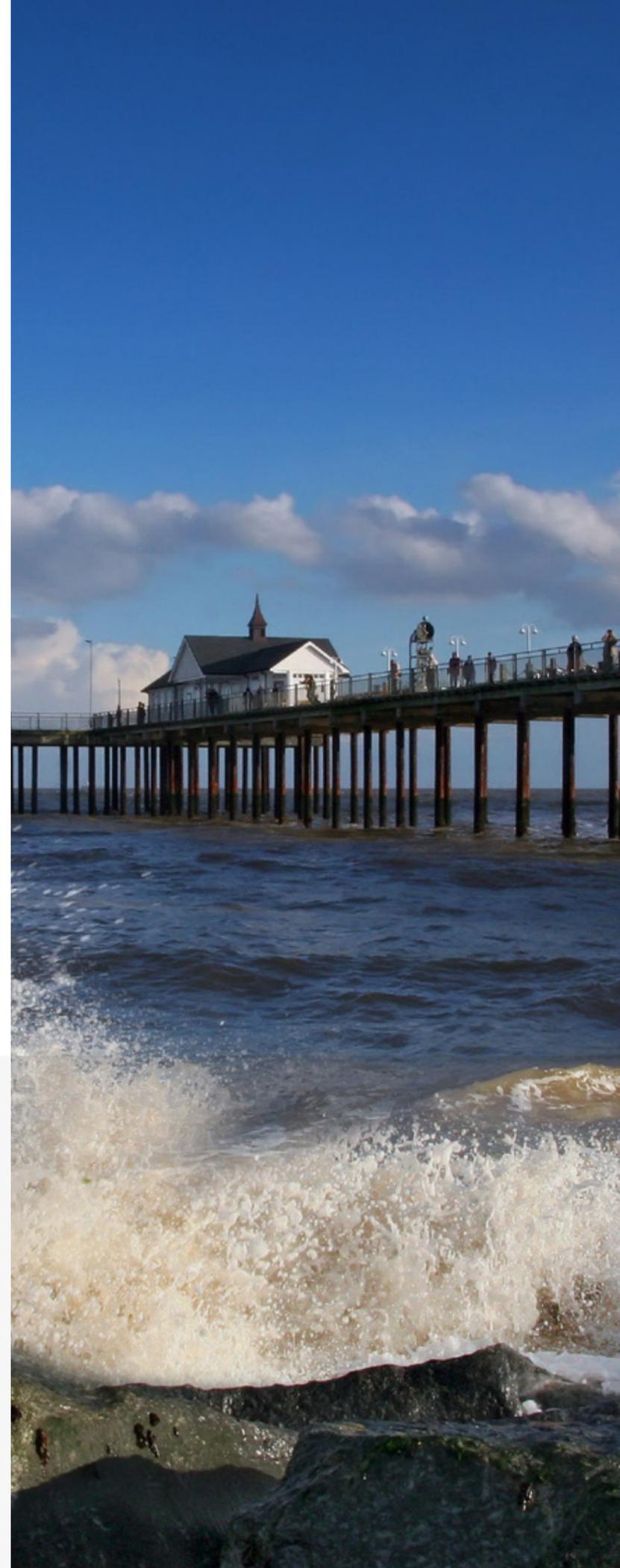
Manages 92km of coastline
in Norfolk and Suffolk

352,000

Approximately 352,000 people
live in the direct coastal zone

Vital

Norfolk and Suffolk coastlines
are vital to industry, agriculture
and tourism



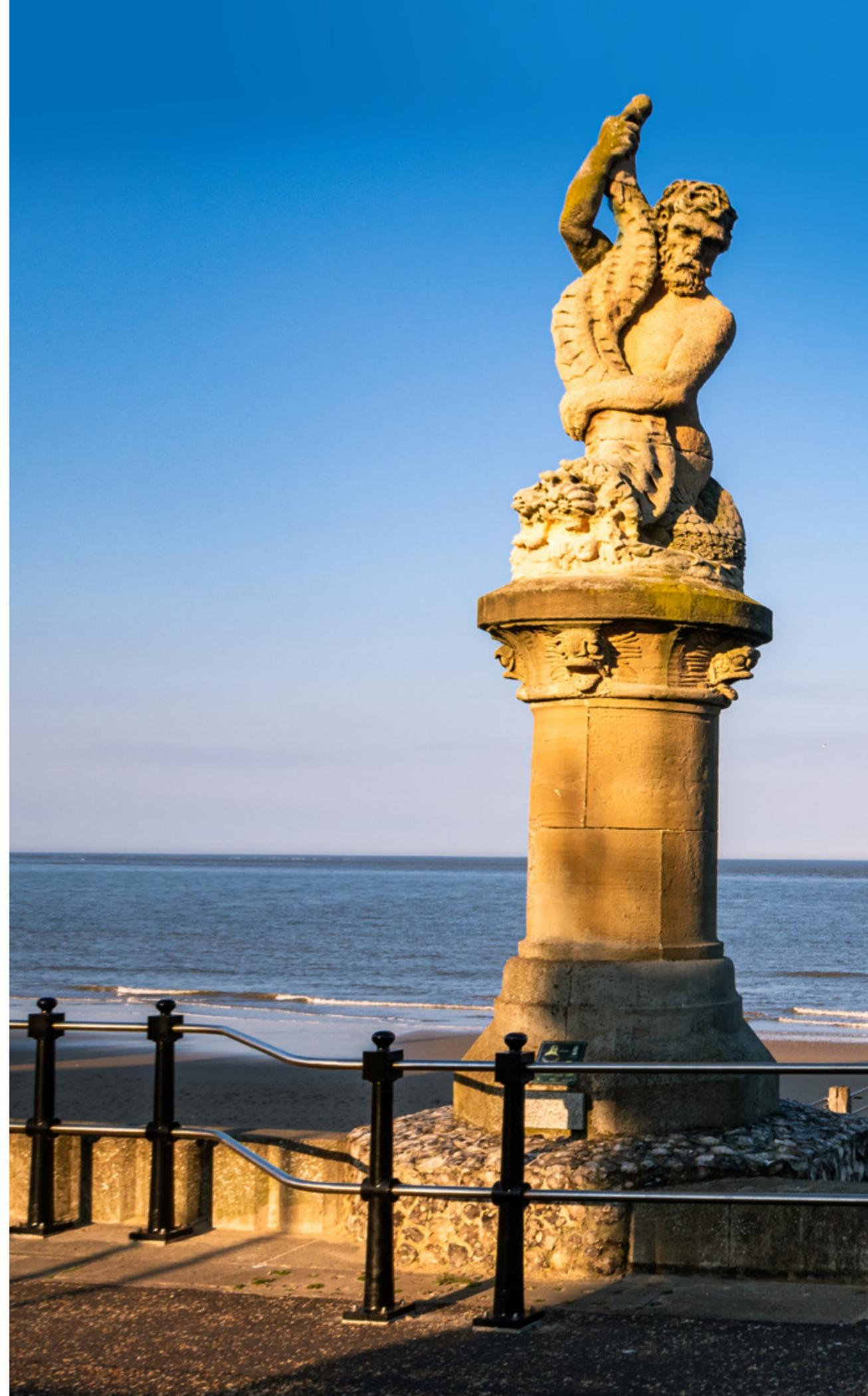
Spotlight on Lowestoft

Coastal Partnership East has adopted best practice in dealing with the risk of flooding at Lowestoft, taking a holistic view of the three identified forms of flooding in the area and preparing a comprehensive flood risk strategy as to how they plan to deal with each one.

In collaboration with Anglian Water, Suffolk County Council and the Environment Agency, The Lowestoft Flood Risk Management Project is about developing a way forward to reduce the risk of flooding from the sea, local rivers and local surface water drainage as a result of extreme weather events, including surges and heavy rainfall. The target date for completion is 2023 and, when finished, the project will support the economic growth and regeneration of Lowestoft, whilst reducing the risk of flooding to existing homes and businesses.

In order to obtain approval from the Environment Agency to access national funding and to build a strong business case for other funders such as the New Anglia Local Enterprise Partnership, an overarching strategy has been developed. This includes numerical modelling and other specialist studies including environmental studies, to ensure the most cost-effective solutions are found to reduce the risks of flooding whilst improving the area for the wider community and local wildlife.

Along the way, Coastal Partnership East is consulting and working with the local community, businesses and organisations to make sure they provide efficient and effective solutions for all parties involved.



The Lowestoft Flood Risk Management Project is a collaboration between:



Case study:

Monkton Flood Alleviation Scheme

Location:
Monkton and Hebburn

Client:
 **South Tyneside Council**

Value:
£2 million

Delivery partner:
Balfour Beatty



100%

of spend within 40 miles

53%

within 20 miles

40%

within 10 miles

Challenge

Hebburn South is predominantly a residential area with large open areas.

Reports of flooding in the area date back to 2005, with regular flooding, either sewer or surface water. In 2012 significant flooding occurred in the area affecting 113 properties as well as heavily disrupting local roads in the area which became impassable for several hours.

A survey undertaken by South Tyneside Council and Northumbrian Water identified approximately 100 properties in the Monkton and Hebburn areas as 'at risk of flooding' at or above the 1 in 75 year threshold.

Numerical modelling of rainfall events using varying storm durations and scenarios helps to establish thresholds of flooding and inform suitable design options.

Action

To help protect homes and businesses in Monkton and Hebburn from surface water flooding, Balfour Beatty led a multi-agency approach to developing the flood alleviation scheme combined with a Living Waterways scheme to daylight a section of the Bede Burn water course. This collaboration delivered a larger, more attractive wildlife area than could have been delivered by parties working separately.

To ensure design options mitigated the greatest risks, modelling was undertaken using varying storm durations over multiple event scenarios. The options for reducing flood risk were based on the principals of reducing surface water inputs, storing and slowing the flow of surface water, storing and slowing the flow of fluvial flows and using swales to intercept overland surface water.

Works included:

- Installation of new highway drainage
- Installation of swales to catch surface run off
- Creation of retention basins

Through the Early Contractor Involvement and close collaboration embedded within the Scape framework the client secured approximately £550,000 worth of value-engineered savings.



Outcomes

The scheme not only provided residents and local schools with peace of mind, but the area has also benefited from an enhanced, green space, rich in wildlife, which residents were actively involved in creating.

The use of natural flood protection measures, such as tree planting, and creating natural habitats such as wetlands, help to reduce the impact of flooding, whilst creating fewer carbon emissions compared to more traditional methods.

The work took around 12 months to complete and provides an increased level of protection, helping to control the flow of surface water by diverting it away from properties and businesses that have been affected by flooding in the past.



In June 2019 the scheme was awarded a top Sustainability award at the Flood and Coast Project Excellence Awards.

The Project Award Panel for sustainability were impressed by the way the team identified the sources of the localised flooding, delivering a scheme in line with natural flood management practices and working with the community directly affected to establish solutions that embrace the local environment.



100%

of the project supply chain were SMEs



98%

of excavated materials diverted from landfill

The project team produced an Employment and Skills Plan which identified opportunities to be created during the project. Opportunities realised included:

3 apprentice starts

13 onsite training days

2 professional development days

3 NVQ completions

8 local job opportunities created with over 120 weeks worked between them

Case study:

Seahouses Main Pier

Location:
Seahouses

Client:

Northumberland County Council

Value:
£3 million

Delivery partner:
Balfour Beatty

Challenge

Seahouses Main Pier was originally constructed in 1889 to support the lime and fishing industries. Today, the harbour plays a valuable role in supporting the local tourism industry as the sole point from which to access the Farne Islands; home to breeding birds and England's largest colony of seals.

Exposure to the elements and constant erosion from the sea had left the pier structure in very poor condition. The pier is within a number areas of scientific interest, outstanding natural beauty and special protection. Working collaboratively with the Marine Management Organisation and Natural England to minimise and prevent environmental impact throughout the duration of the scheme was vital.

Action

To protect Seahouses pier from further erosion and reduce the risk of flooding, a complex restoration of the pier's structure was completed.

Works included:

- Filling underwater voids with concrete to strengthen the existing walls
- Encasing the pier with a 300mm thick layer of locally sourced concrete, in effect creating a new wall around the pier
- Capping the new concrete wall with concrete slabs to secure the core and provide a working deck

With a tight budget, all parties worked together to develop and design a scheme that would deliver value for money whilst ensuring buildability and consideration to the sensitive marine environment.

Through Early Contractor Involvement, a variety of options to reduce construction risk, whilst balancing impact on cost and programme were explored and approximately £380,000 of savings were identified.

Outcomes

Throughout the duration of the project, Balfour Beatty maintained access to the pier for the 150,000 members of the public that embarked on Farne Island boat tours.

The restoration of the pier will help to safeguard the harbour's future, fishing and tourism industries for another 100 years and protect approximately 26 businesses and 139 homes from the risk of sea flooding and coastal erosion.

99%
local spend

100%
SME spend

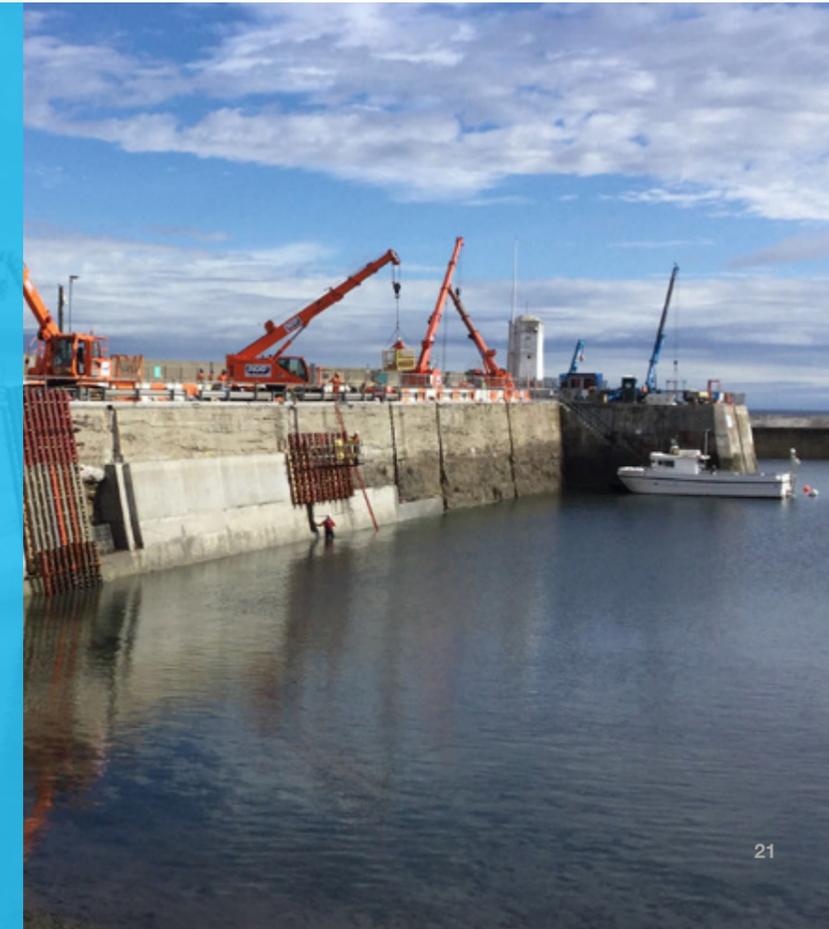
99%
project waste diverted from landfill

4 weeks
work experience created for local people



Balfour Beatty's approach to community engagement was exemplar without any complaints, which is a massive achievement in delivering a project of this complexity in a very public location

Aaron McNeill
FCERM Manager,
Flood & Coastal Erosion Risk Management,
Northumberland County Council



Case study:

Almondbank Flood Protection Scheme

Location:
Almondbank and Lochty



Value:
£17.6 million

Delivery partner:
Balfour Beatty



Challenge

Almondbank and Lochty have experienced a long history of flooding from the River Almond and the East Pow Burn, with serious flooding events taking place in 1993, 1999 and more recently in January 2011.

With average annual flood damage estimated at £1.2 million by The Scottish Environment Protection Agency (SEPA), Perth & Kinross Council needed to invest in more robust flood defences that would protect the community and mitigate flooding in the area.

The River Almond is a tributary of the River Tay and is designated a Special Area of Conservation. As this is an environmentally sensitive area, before work could commence, government bodies were consulted to ensure the works met the legal and contractual requirements for protecting the local area.

£1.2m

estimated average annual cost due to flood damage

Action

Over 150 properties in Almondbank were at risk from surface water and river flooding from both the River Almond and the East Pow Burn. The project involved the creation of a series of flood defences and a temporary flood storage area that would provide protection for the area for a 1:200 year event.

Work included:

- Installation of 1,150 linear metres of sheet-piled flood walls
- 1,600 metres of reinforced concrete flood walls
- 50 metres of earth embankments
- 2,000 metres of erosion protection measures
- Raising and replacement of two vehicle access bridges
- Relocation of the existing pedestrian bridge

To ensure the village and surrounding areas were fully protected, the existing highway drainage system was improved and additional drainage facilities created nearby. A temporary flood water storage reservoir also provided protection during the works.



Outcomes

The flood protection measures installed will protect a significant number of residential and commercial properties and infrastructure in the town of Almondbank for generations to come.

The Almondbank Flood Protection Scheme, proposed under the Flood Risk Management (Scotland) Act 2009 (FRMA), was devised to not only reduce the risk of flooding, but also provide significant long-term safety, social and economic benefits to the community and a healthy economic return for the council.

All risks associated with natural habitats, archaeology, recreation and amenities were minimised through Early Contractor Involvement, data collection and ecological surveys. Some of the long-term environmental benefits of the scheme include the installation of bat and bird boxes in surrounding woodlands, tree planting and the creation of a brand-new habitat for fish to spawn at Pow Burn.

£5.1m

total social value add, or **31p in every £1 spent**

£1.7m

of value added through local employment and skills development programmes

1,130 days

worked by graduates on site

20 NVQs

started and/or finished by people working on the project

GREEN APPLE AWARD WINNER

Environmental Best Practice



Definitions

DEFRA (Department for Environmental, Food and Rural Affairs) – the Department for Environment, Food and Rural Affairs (DEFRA) is the government department that is responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the UK.

FCERM (Flood and Coastal Erosion Risk Management) – the management of flood and coastal erosion risk across England.

GiA (Grant-in-Aid) – money from the government contributed towards a specific project. GiA is based on a government decision that the recipient should be publicly-funded – in the UK, most recipients are non-departmental public bodies, such as the Environment Agency for the purpose of this research.

LLFAs – (Lead Local Flood Authorities) – LLFAs were created under The Flood and Water Management Act 2010, which requires county councils and unitary authorities to manage local flood risks by working collaboratively across the Risk Management Authorities in their area.

Local Levy – a levy placed on local authorities by the Environment Agency to contribute towards flood defence work.

MHCLG (Ministry of Housing, Communities and Local Government) - the UK government department for housing and communities, supported by 13 agencies and public bodies. The MHCLG aims to create better places to live and work and give more power to local people to shape their community.

PF (Partnership Funding) – otherwise known as ‘Flood and Coastal Erosion Resilience Partnership Funding’, is a policy introduced by DEFRA in 2011 which funds flood reduction and coastal erosion risk projects by sharing costs between national and local funding sources.

Real terms – refers to a value that has been adjusted to account for the effects of inflation.



Methodology

Data for expenditure on flood and coastal erosion risk management 2009/10 to 2018/19 was obtained from a freedom of information request providing Environment Agency actual spend. Additional data was sourced from the Department for Environment, Food and Rural Affairs data on central government funding for flood and coastal erosion risk management.

Local authority outturn data and Environment Agency local levy contributions was obtained from the Ministry of Housing, Communities and Local Government. The Local authority outturn data captured includes spending on defences against flooding, land drainage and related work and coast protection.

All data has been shown with and without the effects of inflation using the HM Treasury's GDP deflator (December 2019 publication).

About Scape Group

Scape Group is a public sector organisation, dedicated to creating ongoing efficiency and social value via the built environment. Scape and its subsidiaries offer fully managed frameworks, property services, innovative design solutions, community investment opportunities and joint ventures.

By bringing together the strongest teams from the public and private sectors, Scape's rapidly deployed, highly measurable and collaborative approach delivers value for money and quality buildings while stimulating local economic growth and community enrichment.

Scape operates with a buying capacity of £12bn and has helped to deliver over 12,000 public sector projects with more than 1,800 currently in progress. For the past three years, Scape Group was named the 'Best Client to Work With' at the annual Construction Enquirer Awards.

£12bn
buying capacity

Over
12,000
public sector projects delivered

1,800
live projects at any one time



For more information visit:
scapegroup.co.uk

For press enquiries, please contact:
Instinctif Partners: 0207 457 2020

Laura Taylor
laura.taylor@instinctif.com
0207 866 7854

Emma Marshall
emma.marshall@instinctif.com
0207 457 1403

Scape Group: 0115 958 3200

Matt Carrington-Moore
Chief Strategy Officer
mattcm@scapegroup.co.uk



2nd Floor, City Gate West, Tollhouse Hill,
Nottingham, NG1 5AT

+44 (0)115 958 3200
general@scapegroup.co.uk

scapegroup.co.uk

 **@Scape_Group**  **/scape_group**