

Future Flood Risk Management in Cumbria

In December 2015, Cumbria and other counties in northern England suffered extensive flooding. In Cumbria alone, thousands of properties flooded with many more communities affected by damage and destruction.

Some of our flood defence structures were damaged during Storm Desmond and the later storms. Our immediate priority was to ensure all of our structures were inspected and where necessary repaired. After Storm Desmond we also visited all of the affected communities to help support their recovery and to provide help and advice. We then gathered local information on how the flooding affected each community, holding community events across the County supported by local councils and key partners. This information has now been collated and published and has contributed to our understanding of the causes of flooding.

How we manage flood risk in the future

The information we have gathered has been the basis of our work to identify how we can manage flood risk across the County. We have a dedicated team who have developed an extensive list of options on how we could manage flood risk from source to sea on a catchment scale. The river catchments that we are working with are; the Eden, the Derwent and West Cumbria, and the Kent and Leven. Each of the catchments will have a number of identified options and these are categorised into 4 key themes; Upstream Management, Strengthening Defences, Maintenance and Resilience.

At the request of communities to be more involved in our decision making, we are wanting to take this opportunity to share with you the range of options we have identified for each community and catchment area and we will be holding community **drop-in events** in an number of locations across the County. These events are also an opportunity for residents to receive advice on community and personal resilience

Community Drop-in programme of events

Tuesday 27th June – Tufton Arms Hotel, Appleby 3pm to 7pm
Future Flood Risk Management in Upper Eden Catchment – Appleby, Pooley Bridge and Eamont Bridge

Wednesday 28th June – Skiddaw Hotel, Keswick 3pm to 8pm
Future Flood Risk Management in Upper Derwent – Braithwaite and Keswick

Friday 30th June – Christ Church, Cockermouth 3pm to 8pm
Future Flood Risk Management in Lower Derwent & West Cumbria – Cockermouth, Workington, Flimby, Maryport and Wigton

Tuesday 4th July – Greystone Community Centre, Carlisle 3pm to 8pm
Future Flood Risk Management in Lower Eden – Warwick Bridge, Low Crosby, Rickerby and Carlisle

Thursday 6th July – Sands Centre, Carlisle 3pm to 8pm
Future Flood Risk Management in Lower Eden – Warwick Bridge, Low Crosby, Rickerby and Carlisle

Friday 7th July – The Assembly Room, Kendal Town Hall, Kendal 3pm – 8pm
Future Flood Risk Management in Kent & Leven – Kendal, Burneside, Staveley, Ings, Windermere, Ambleside, Grasmere, Backbarrow and Troutbeck Bridge

and our operational response to flooding.

The Key Themes

The options mentioned above have been categorised into four themes. Each theme covers a number of different potential actions.



Upstream Management covers a wide range of measures such as flood storage, changing flood plain management and natural flood management measures. These measures slow the flow of water and can reduce the peak level of floods.



Strengthening defences includes actions like raising the height of existing flood defences or making changes to river channel capacity/shape.



Maintenance includes activities such as gravel management, bank repairs and tree works. This is often work which is done on a regular basis to ensure flood risk is managed appropriately. Key maintenance activities are shown on the google map - a more complete list of the Environment Agency's scheduled maintenance can be found on the [gov.uk website](http://gov.uk).



Resilience encompasses actions which make a structure, a group or the community stronger and more prepared. This includes physical measures such as the installation of 'property level protection,' and changes to bridges or properties to make them stronger and less susceptible to damage during a flood. Community Flood Action Groups and Flood Warning Areas also come under this category.

The Environment Agency Google Map

If you are unable to attend any of the Community Drop-in events we have developed an online map to show all of our work that has been delivered, programmed to be delivered and the list of potential options for future flood risk management. Click on the following link to access the map <http://bit.ly/2r031CP>

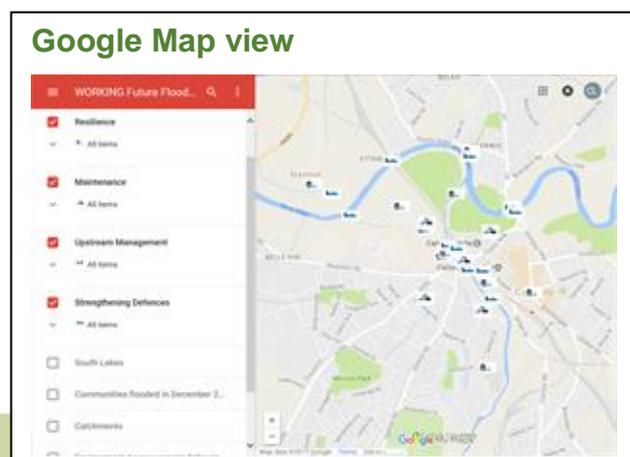
How to use the Google Map

Once you have accessed the google map you will see a key on the left hand side of the screen which contains a number of layers that correspond with the key themes. To see what information is available you can tick all or just the relevant boxes of the themes listed. You can look at the map at a county, catchment or community scale by zooming in and out. There is a search facility in the top toolbar to search for a specific location.

There is also a layer showing the repair works we carried out to our flood defence structures following Storm Desmond.

To access the information, click on one of the icons on the map and it will bring up a text box which will outline if this activity is complete, ongoing, possible or unlikely by highlighting it with a bullet point.

If an activity is prefixed with "option to" under option description this means that it is part of the list of options for future flood risk management. Each of these are purely options at this stage and there is no guarantee that this will be an activity that will be delivered now or in the future.



What Next

This is the first step for us to initially identifying all the possible options for how we better manage flood risk across key catchments in the County. We will not deliver all of these options but will look to deliver the best options that are economically viable, technically feasible, environmentally sustainable and acceptable to local people. The google map and the community drop in events are designed to share this information with you.

All of the 'possible' options will be narrowed down over time to ensure we put in place the most appropriate and efficient measures. We will be developing this over the coming months and will return to share these with you and gather your views later this year.

Timescales and Funding

In 2016 the government announced additional money to be spent on flood defences in a number of communities within Cumbria and the options we are sharing with you is part of this process. Once the preferred options have been identified and approved, work will start in those areas which have already secured funding. Typically it can take 3 years to go through the full process to starting works on the ground. Where we can, we will deliver smaller, less complicated work this year however, the majority of the work will commence in 2018 and 2019.

For those communities without funding currently allocated we will continue to develop preferred options and this will be used to apply for funding. This means that if funding is then approved we are able to deliver works more quickly.



Be flood ready

It is important that you are prepared for flooding and we encourage you to take 3 simple steps:-

1. Sign up to Floodline Warnings Direct to receive free flood warnings
2. Know what to do when a flood warning is issued. Have a personal flood plan for you and your family
3. Keep an eye on the situation. You can view a 5 day weather forecast and monitor the river levels online.

Visit our [website](#) or ring Floodline on 0345 988 1188 for information

Be Aware, Be prepared

We will never be able to guarantee a completely flood-free future, and so we encourage anyone living or working in a flood risk area to be aware and to be prepared. We can support you by; signing you up to receive free **flood warnings**, helping you to produce a **personal flood plan**, offering **property resistance and resilience** advice and supporting the formation and ongoing work of a **community flood action group**.

Flood Warning Service

The Environment Agency provides free flood warnings to most areas at risk of river or sea flooding via their Flood Warning Service (FWS). You can register to receive early warnings of flooding free of charge. You can register for Flood Alerts that will give you a warning of flooding to low lying land and roads and/or a Flood Warning that will be a specific warning of imminent flooding to property.

Ensure you sign up to FWS to get these free warnings, and keep your contact details up-to-date. Visit <https://www.gov.uk/sign-up-for-flood-warnings> or call 0345 988 1188.

Flood Action Group

'Flood Action Groups' (FIAG's) are groups of local residents who work together to reduce flood risk for their community. Many FIAG's will produce a community plan detailing what community action may take place to support and help their local community respond and recover from flooding.

FIAG's may have different names or ways of working but the ambition of each one is to be better protected from flooding. We work closely with these groups to ensure they have the support they need to fulfil their roles.

If you would like further information on FIAG's within your area or you are keen to set up a FIAG within your community please contact us by e-mail at CLfloodresilience@environment-agency.gov.uk

Other information

The **Cumbria Strategic Flood Partnership** was formed in response to the flooding in December 2015 and was tasked with investigating possibilities for catchment scale working. Further information on the partnership, their **Action Plan** and **Community Action Tables** can be found at - <https://www.gov.uk/government/publications/cumbria-flood-action-plan>.

A number of knowledge sharing events hosted by the Cumbria Strategic Flood Partnership have also taken place. Click on the links below to view

Geomorphology workshop videos:

https://www.youtube.com/playlist?list=PLfQeDt_9dLX0JAIVX8CFjRp1IBJ0Ry1eS

Woodland management workshop video:

https://www.youtube.com/playlist?list=PLfQeDt_9dLX2kTo-PAiLx2PAAdyQ6J1eSX

Plan, prepare, respond, recover workshop video:

https://www.youtube.com/playlist?list=PLfQeDt_9dLX2Po2RvUzIfgQcOQSget-o

Natural Processes workshop video:

https://www.youtube.com/playlist?list=PLfQeDt_9dLX0L-rQK_vms8xLN_IXN9PDA

The Environment Agency are funding **Newground** to support our work to engage individuals and communities to be flood ready. Their role includes helping residents organise joint applications for the council's resilience grants, facilitating new community flood action groups and supporting businesses with resilience advice. If you would like further information on the support on offer contact CLfloodresilience@environment-agency.gov.uk

We work alongside "ACTion with Communities in Cumbria" (**ACT**) to support community groups. ACT are working throughout the County and are supporting community emergency planning. The partnership has produced numerous toolkits which are helpful at every stage of community planning. The toolkits, and contact details, can be found on their website <http://www.cumbriaaction.org.uk/Resources-Publications/Toolkits-Workbooks>

Glossary

Attenuation	The reduction in a water level, which may occur as the water passes downriver. This includes the effects of any flood storage and reservoirs.
Buffer zone/strip	A strip of riverside land which is removed from intensive agricultural use and instead used to reduce the impact of adjacent land use, to provide appropriate habitats and/or to provide flood mitigation.
Channel	A passage containing flowing water.
Channel conveyance	A measure of the amount of water a channel can hold within its banks at a particular point without overflowing.
Confluence	The point where two or more watercourses join.
Converge (Converges/convergence)	The joining of two or more watercourses.
Conveyance	The movement of water from one place to another. Conveyance is affected by a channel's cross section, slope, shape and roughness.
Culvert	An underground, man-made, fully enclosed channel (e.g. a large pipe) which conveys water from one point to another, for example under a road or beneath a building.
Debris Screen (or Trash Screen)	A screen comprising closely-spaced bars, positioned upstream of a structure (e.g. a culvert) or equipment (e.g. a pump), to trap waterborne debris and prevent it from causing blockages or damage.
Deposition (Gravel)	The settling of gravel within the channel or flood plain after being transported downstream by the flow of water.
Dissipate	To reduce the amount of water at a location, for example through drainage.
Dredging	Underwater excavation works to deepen a channel and thus increase channel conveyance.
Erosion	The natural wearing away of soil and rock by wind, flowing water or waves. Riverbeds, riverbanks and coastal landforms are all affected by erosion.
FAG / FIAG	Flood Action Group. A group of local residents who work on behalf of the wider community to reduce flood risk.
Flood Warning Service (FWS)	An Environment Agency service which uses forecasting to give people prior warning of an impending or likely flood event to enable them to take action to protect themselves and their property.
Flow	Multiple meanings dependant on context: 1) The rate at which water travels 2) The movement of water e.g. it's direction
Geomorphology	The scientific study of land forms and the processes which create them.
Gravel trap	An in-river structure designed to capture gravel being transported downstream to prevent it travelling any further. The captured gravel is later removed.
Headwater	The source and uppermost sections of a watercourse.
Hydrology	The scientific study of the water cycle and the properties of water.
Main watercourse	The Environment Agency is responsible for carrying out maintenance, improvement or construction work on main rivers to manage flood risk. Main rivers are a statutory type of watercourse in England and Wales , usually larger streams and rivers, but also include some smaller watercourses. A main river is defined as a watercourse marked as such on a main river map, and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river. The Environment Agency's powers to carry out flood defence works apply to main rivers only.
Natural Flood Management	A range of techniques that aim to reduce flooding by working with natural features and

(NFM)	characteristics to store or slow down flood waters.
Offline	Refers to an area away from and separated from the main water channel e.g. a flood storage area which bypasses the channel.
Online	Refers to an area within the channel.
Ordinary Watercourse	An ordinary watercourse is one of the two types of watercourse in statutory language in England and Wales . Ordinary watercourses include every river , stream , ditch , drain , cut, dyke , sluice , sewer (other than a public sewer) and passage through which water flows and which does not form part of a main river. An internal drainage board where relevant, or lead local authority has permissive powers to carry out flood defence works for ordinary watercourses at their discretion.
Outflanking	When (flood) water flows <i>around</i> a structure (such as a flood defence) and enters the area behind the structure.
Outfall	An outlet through which water is discharged into a channel or other water body.
Overtopping	The passage of water over a structure such as a flood embankment or sea-wall, due to high water levels or wave action.
Property Level Protection	A range of flood resistant and resilient measures applied to individual properties which aim to prevent flood water entering (e.g. door barriers) and/or limit the damage caused when flood water does enter (e.g. waterproof plaster).
Regrade (a river bed)	Manually altering the level or gradient of a riverbed to, for example, improve conveyance.
Riparian	Relates to the banks of a river, stream or ditch and the adjoining land.
Riparian owner	Owner of land or property alongside, above or with a watercourse running through it. Under law riparian owners have rights and responsibilities relating to the stretch of the watercourse which falls within the boundaries of their property.
Sill level	The level of an obstruction in a river channel, lake or sea-bed above which water is able to flow freely under the force of gravity.
Sluice (gate)	An adjustable gate or valve which can be used to change the level of a body of water by controlling the flow of water into or out of it.
Standard of Protection (SoP)	A measure of an assets ability to perform its flood defence function (in terms of the worst flood event it could function normally in) without failing or sustaining damage. The standard is often given as a return period (1 in 100 year) and is determined partly by the asset's design and current condition and partly by other factors such as climate change and river flows.
Sump	A hole or depression into which water is drained to facilitate its removal, generally by pumping.
Sustainable Drainage Systems (SUDS)	A sequence of management practices and control structures which replicate natural drainage processes with the aim of managing surface water close to source and reducing surface water flood risk.
Surcharge	The overloading of a structure beyond its design capacity due to the inflow and infiltration of water i.e. overflowing manholes resulting from surcharged sewers.
Swale	Shallow, vegetated depressions designed to convey surface water through a site and into the drainage system or a water storage area. Swales also improve water quality and can be designed to slow the flow and increase infiltration.
Watercourse	Any natural or man-made channel, above or below ground, through which water flows, such as a river, beck, ditch, mill stream or culvert.