

Recovering from Storm Desmond; the role of Natural Flood Management in Cumbria

Dan Bond | Flood Risk Manager | Environment Agency

 @danbond0



A Storm called Desmond



Storm Desmond: 1 to 6 December 2015 (Cumbria)

Storm Desmond brought exceptional rainfall to the north west of the country. In a 24 hour period, 34.1 cm of rain fell at Honister, Cumbria - the highest ever recorded.



1.15 trillion
litres of rainfall



Enough to cover all
of Cumbria with
16.1 cm of water



Rainfall would fill
Wembley stadium
almost **290 times** over



North of England floods: 5 December 2015 to 6 January 2016

**Record
rainfall**



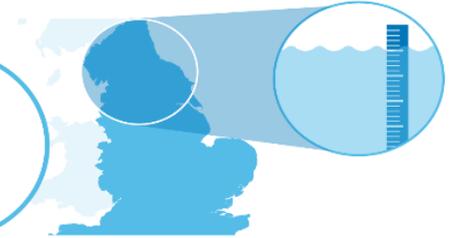
December was the wettest month ever recorded*

341.4
mm



Highest 24 hour rainfall - Honister Pass, Cumbria

14



Catchments experienced their highest ever river flow

12,500
(Desmond)



10,900
(Eva)

Properties protected during storms Desmond and Eva

Around
13,000
households



Around
4,000
businesses

Properties flooded**

Over
350



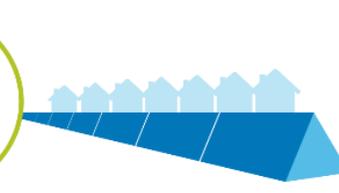
Communities visited by flood support officers

92



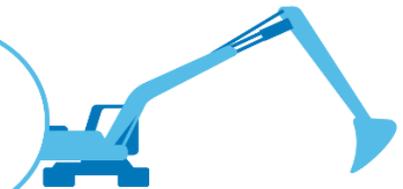
Severe Flood Warnings issued

2,300



Metres of temporary barriers used to protect communities

Around
650



Flood risk assets needing repair



Supporting and representing flood risk communities

SPAR

Tel: 01299 403000



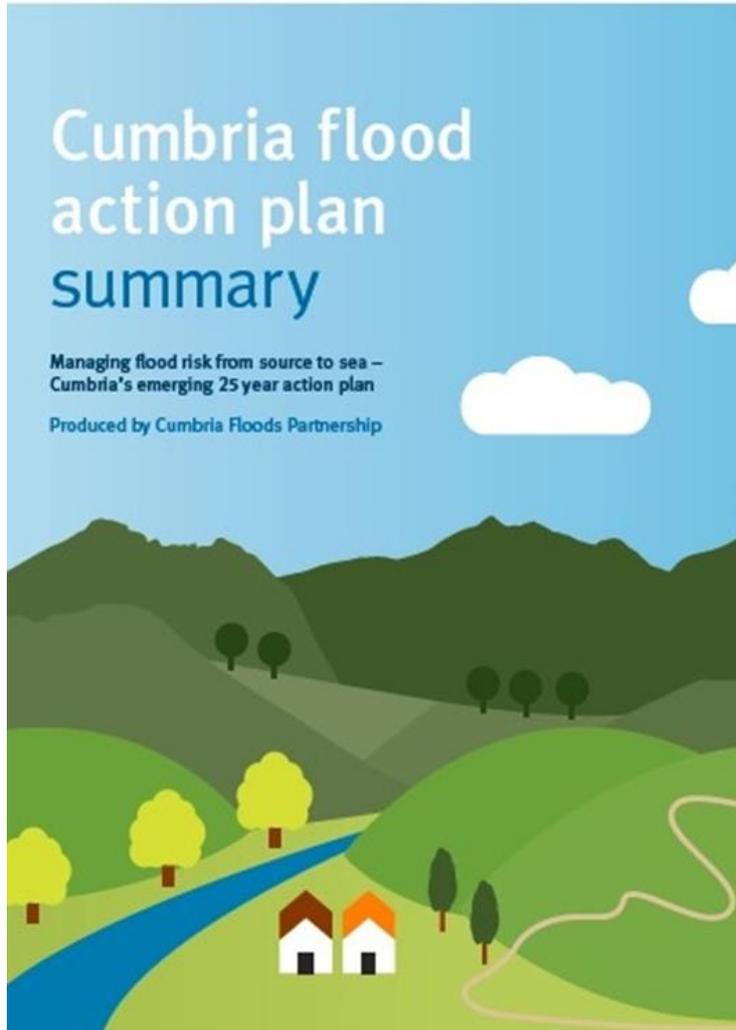
Supporting and
flood risk com
Tel: 01299 403000



Recovery



Game changer?



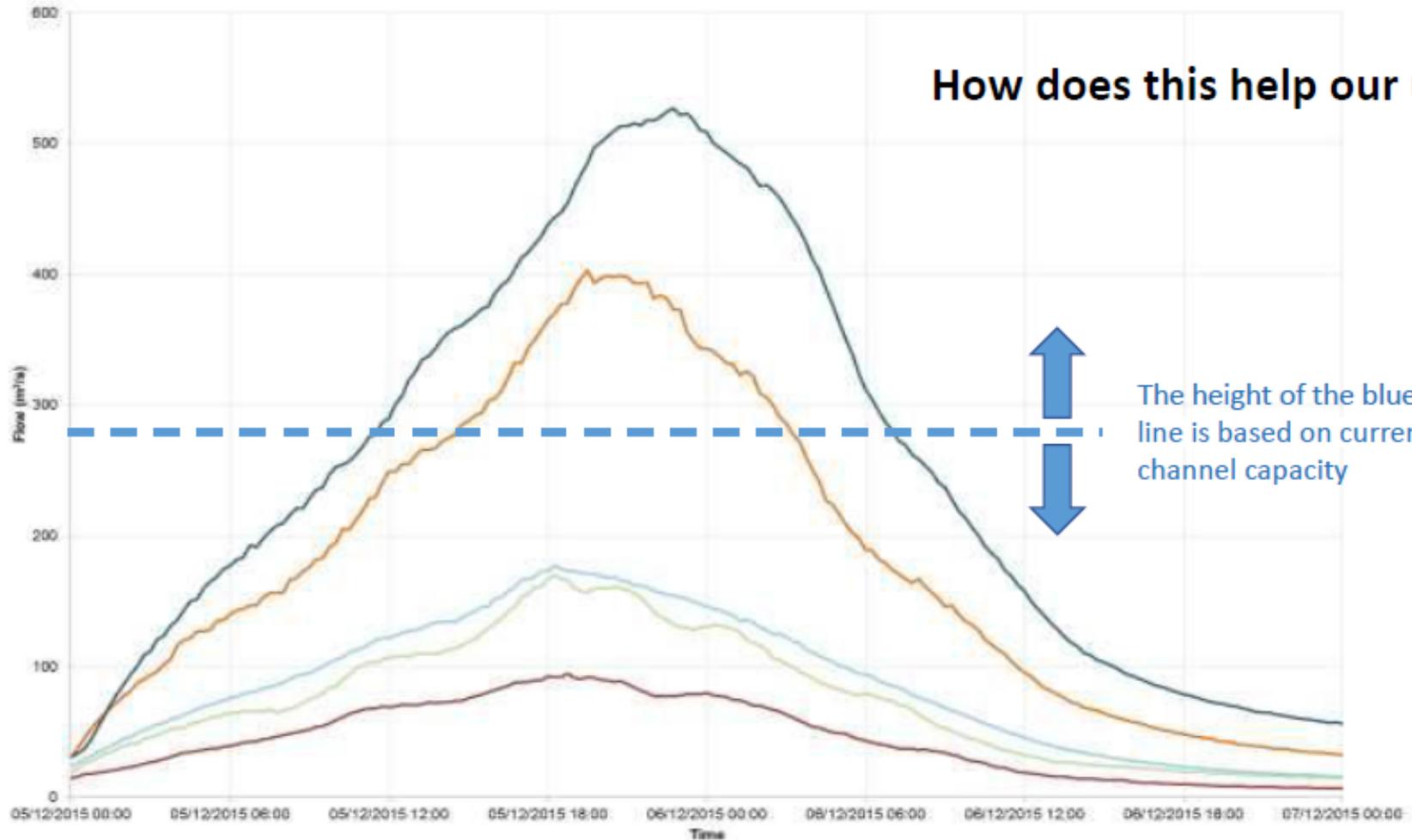
Defra press release 12 December, 2015

*“The partnership will consider **“what improvements to flood defences in the region may be needed,”** to **“look at upstream options for slowing key rivers to reduce the intensity of water flows at peak times,”** and to **“build stronger links between local residents, community groups and flood defence planning.”**”*



Flood Hydrograph of Gauged River Flows:

Kent catchment on the 5th-6th December 2015



The volume of water above the blue line is the amount which would need to be held in upstream storage

The volume of water below the blue line is the manageable amount of flow through the current system and bridges

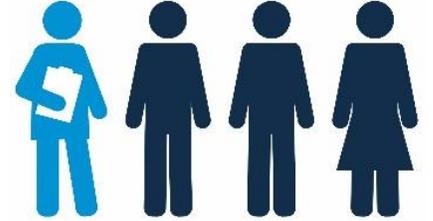
Managing flood risk options



Strengthening defences



Resilience



Water Level
Management Boards



Upstream land
Management options



Maintenance

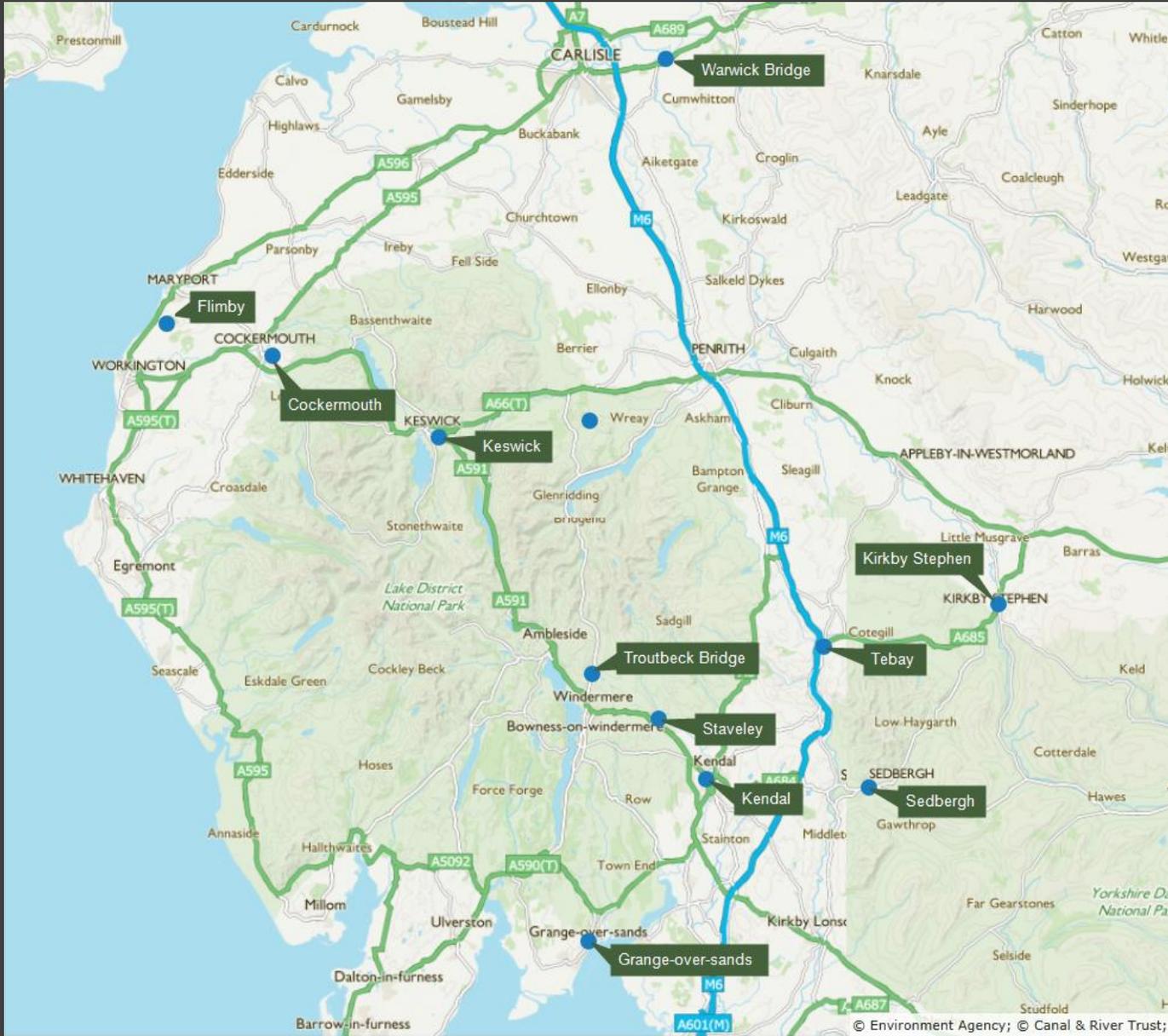
DEFRA funded NFM projects

25 year environment plan says:

‘Actions we will take include: *Learning from the £15m Natural Flood Management funding to develop our knowledge, identifying and promoting practical solutions for local implementation.’*

DEFRA want to know how your projects have:

- reduced flood or coastal erosion risk to homes
- improved habitats and increased biodiversity
- supported and developed partnership working with and between communities
- contributed to research and development



Cumbria Programme

- £2.5 Million Package
- Led by range of partners
- Co-ordinated monitoring programme led by Lancaster University
- Delivered by 2021



Tebay



Flimby



Monitoring



Monitoring flumes providing real time data



Mallerstang: up to 30% increase in infiltration rates.



Grange over Sands: Provided very useful data during storm Callum, looking to calibrate it to provide an early warning for that community.



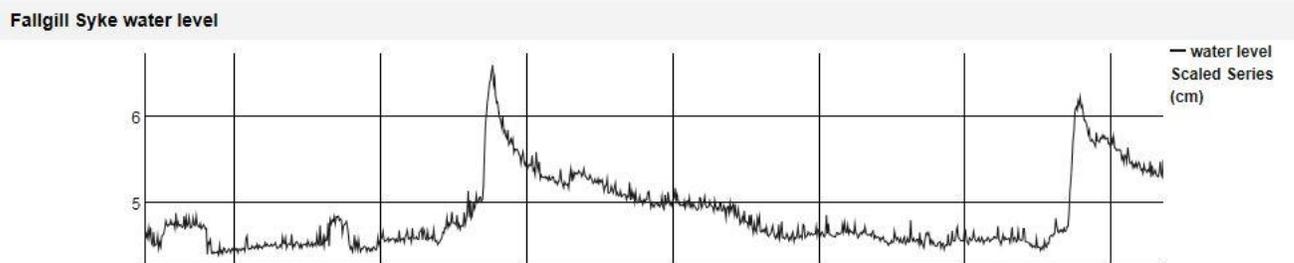
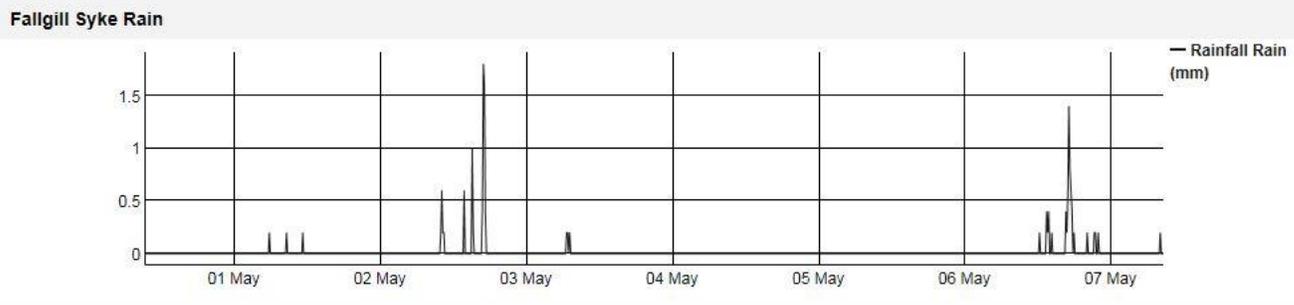
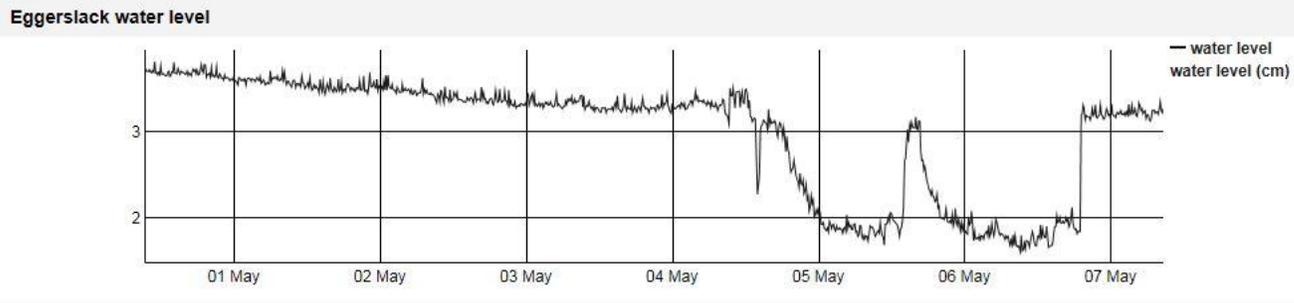
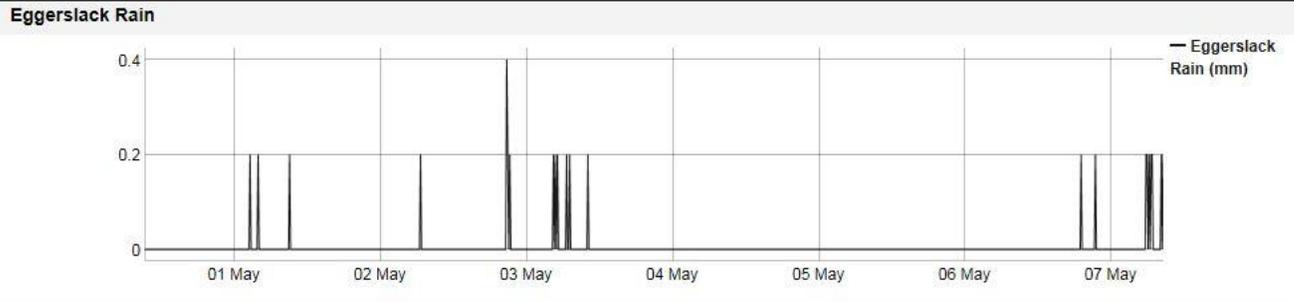
Sedbergh: provided baseline data prior to interventions being built.



Flimby: provided baseline data prior to interventions being built, has the potential to act as an early warning for the community.



Tebay: providing great data with interventions being built, has the potential to act as an early warning for the community.



Early findings...

- Helping to target intervention
- Seeing some early benefits
- Dry summer doesn't help!
- Used for Community Flood Warning
- Monitoring till 2025/26

Future opportunities & bridge building

- Integrating WEG and other funds to further boost our NFM expenditure in Cumbria to nearly £5m
- Building close working relationships with landowners post Brexit.
- Proving effectiveness and altering future investment strategies to protect the smaller more isolated communities.





'Let nature be your teacher'

William Wordsworth