

## Annex A: Headlines from the Phase 1 Report

At the request of Welsh Government, Natural Resources Wales has carried out an assessment of the information received to determine the potential costs which may be eligible for the Welsh Government's flood and coastal risk management grant funding. These are estimated costs for works necessary to restore the national network of Local Authority and Natural Resources Wales managed coastal defences which were damaged specifically during the recent storm events.

This assessment has estimated that around **£8.1million** may be eligible for flood and coastal risk management grant funding

### **December 2013 event** – *Impacts upon North Wales only*

- Peak sea level was the highest recorded in Liverpool Bay for at least 21 years.
- Natural Resources Wales issued 2 Severe Flood Warnings and 15 Flood Warnings.
- Over 400 properties were advised to evacuate in Rhyl.
- 155 properties flooded internally and 160 properties were indirectly affected.
- Approximately 65 coastal defences were damaged.
- Costs to both temporarily and permanently restore damaged defences to their pre-storm condition are estimated at £5.3million.
- Defences protected over 24,000 properties in North Wales during this event and over
- £960 million of damages were avoided.

### **January 2014 event** – *Widespread impacts upon the West and South Wales coast*

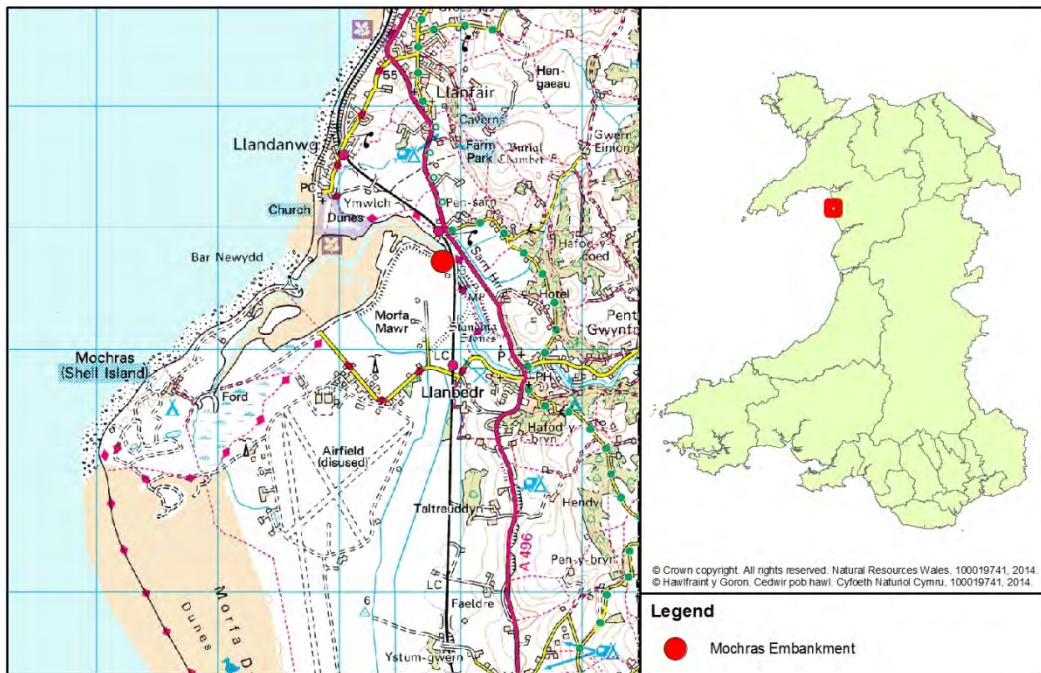
- Peak sea levels on January 3rd 2014 were the highest on the south and west coast of Wales for at least 16 years.
- Natural Resources Wales issued 6 Severe Flood Warnings and over 100 Flood Warnings.
- Over 1050 properties were advised to evacuate in Borth, Aberystwyth, Cardigan and Newport combined.
- 150 properties flooded internally and 415 properties were indirectly affected.
- • Approximately 110 coastal defences were damaged.
- Costs to both temporarily and permanently restore damaged defences to their pre-storm condition are estimated at £2.8million.
- Defences protected over 50,000 properties around the coast of Wales during this event and over £2billion damages avoided.

**Combined storm impacts:**

- Network Rail assets were significantly damaged during the storms, with the Barmouth to Pwllheli line remaining closed for several months due to damage at Llanaber.
- Widespread damage occurred to the Wales Coastal Path with repair costs estimated at £340,000.
- Over 360ha of agricultural land was flooded, most significantly in January 2014 at Llanbedr with flooding to four properties, over 200ha of farmland and loss of over 120 sheep.
- New palaeo-environmental and archaeological discoveries have been uncovered, such as ancient submerged forest and peat cuttings at numerous locations.
- Environmental change has been identified at 37 Sites of Special Scientific Interest and 10 Special Areas of Conservation.

## Circumstances associated with the flooding of Llanbedr in January 2014

In January 2014 the Mochras flood bank at Llanbedr in north west Wales was breached over a length of approximately 50m, as a consequence four properties were flooded, along with significant areas of agricultural land twice daily under high tide conditions.



This section of embankment has been in place for many years. It is believed it was originally constructed using locally sourced material (i.e. river gravel silts and clays etc.) with the design height defined from previous flood event levels. The flood bank as a whole is a grass earth embankment with reasonably wide crest widths and, although slender in places the front and back slopes are acceptable.

The majority of the seaward face is reinforced by a stone berm and stone '*rip rap*' that extends two thirds up the height of the embankment. The purpose of this is to reduce wave impact and bank erosion. The stone rip rap does not extend along the whole length of the embankment and the more sheltered section does not include this stone rip rap

In the immediate aftermath of the storm, a helicopter was used to position giant, industrial-sized sandbags to fill the gap ahead of further predicted high tides.



In early April work to repair the breach was completed. This was a challenging project due to the difficult access conditions and the hostile tidal environment. The works required around 12 weeks to complete and involved construction of an access road to the breach and 15,000 tonnes of boulders, clay and soil.

The new section of the bank has been reinforced with a solid clay core, strengthened with boulders and covered with topsoil to bring it back to the required level of flood protection.

Over coming months engineers will monitor its performance.