

Ganol Climate Change Impact

Following Storm Callum and its after effects the question was posed:
Could Wales face a repeat of 2018's extreme weather?

In response, the potential impact of climate change on sewer flooding in the Ganol catchment, north Wales, has been assessed through the verified hydraulic model comparing:

- The Pre-AMP6 Scenario
- Pre-AMP6 Scenario with Climate Change 2050
- Post-AMP7 Scenario with Climate Change 2050 with 48ha RainScape

Using this model the following scenarios have been assessed

- The potential impact of a Storm Callum equivalent storm
 - The spill frequency of key assets in the Ganol catchment
- It is critical to understand the risk to inform future decisions as weather becomes more extreme.



Spill Counts

The primary driver for the AMP6 work in the Ganol catchment was reducing spills to rivers or coasts with Shellfish Water and Bathing Water drivers. The impact of these is summarised below.



Project	No of Spills (>50m3) per year		
	Baseline	Future 2050 Case	Future 2050 with PS Improvements and RainScape
Llandudno Junction SPS	23	28	10
Tywyn SPS	26	31	8
Church Rd SPS	33	40	14
Conwy Quay SPS	49	59	12
Deganwy	12	14	12
St Agnes CSO	14	17	12
Total	157	188	68

Flooding

Whilst water quality and spill counts were the primary driver for the work in the Ganol catchment the model has been used to assess the impact of Climate Change plus the effectiveness of Welsh Water works on flooding

Storm Callum 2018

Storm Callum on 12th October 2018 had a total rainfall depth of 19mm in Cardiff, 39mm in Llandudno, 78mm in Llanelli and 203mm in Brecon. The Ganol catchment escaped the big rainfall depths and sewer flooding but might not be so fortunate in the future, as this recent local case shows.

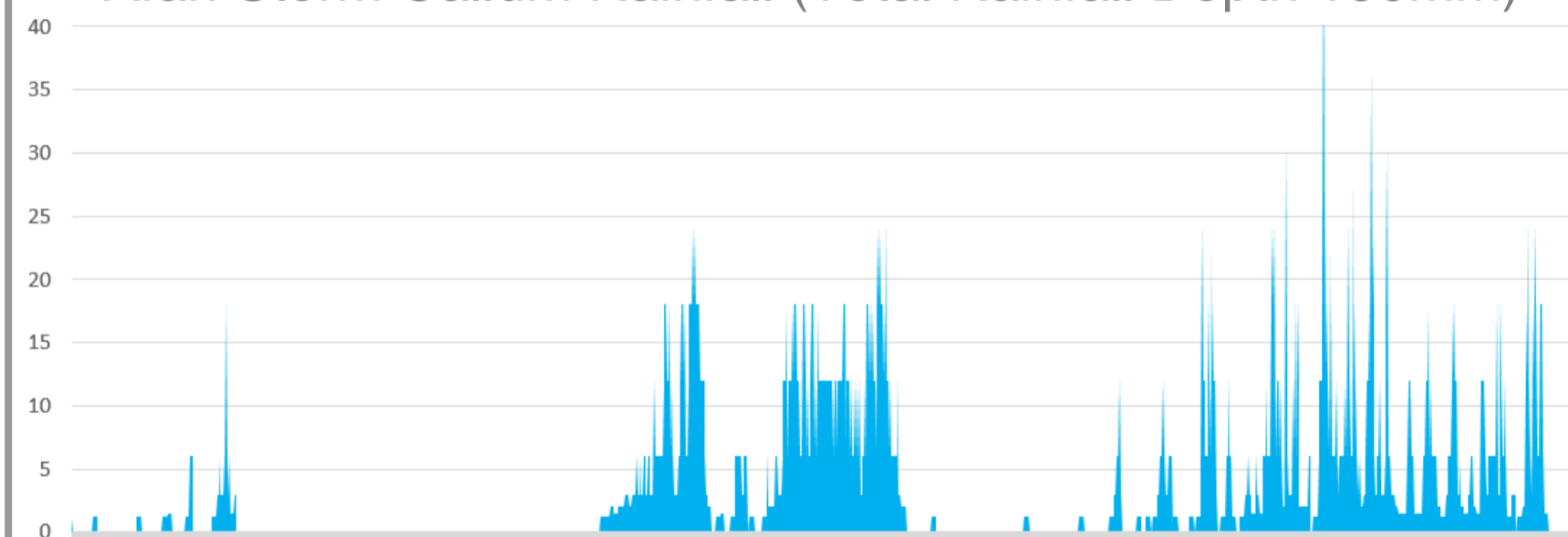
Rhyl 19th July 2017



On the 19th of July 2017, 48 mm of Rainfall was recorded in Prestatyn, North Wales. This was 10mm more than the Storm Callum event in the region. The image left shows flooding and a surcharged manhole on Ffordd Derwen.

The maps to the right show the sewer flooding that would have occurred with a Storm Callum equivalent hitting Colwyn Bay in the Ganol catchment as it was recorded in Afan, the profile of rainfall can be seen below.

Afan Storm Callum Rainfall (Total Rainfall Depth 150mm)



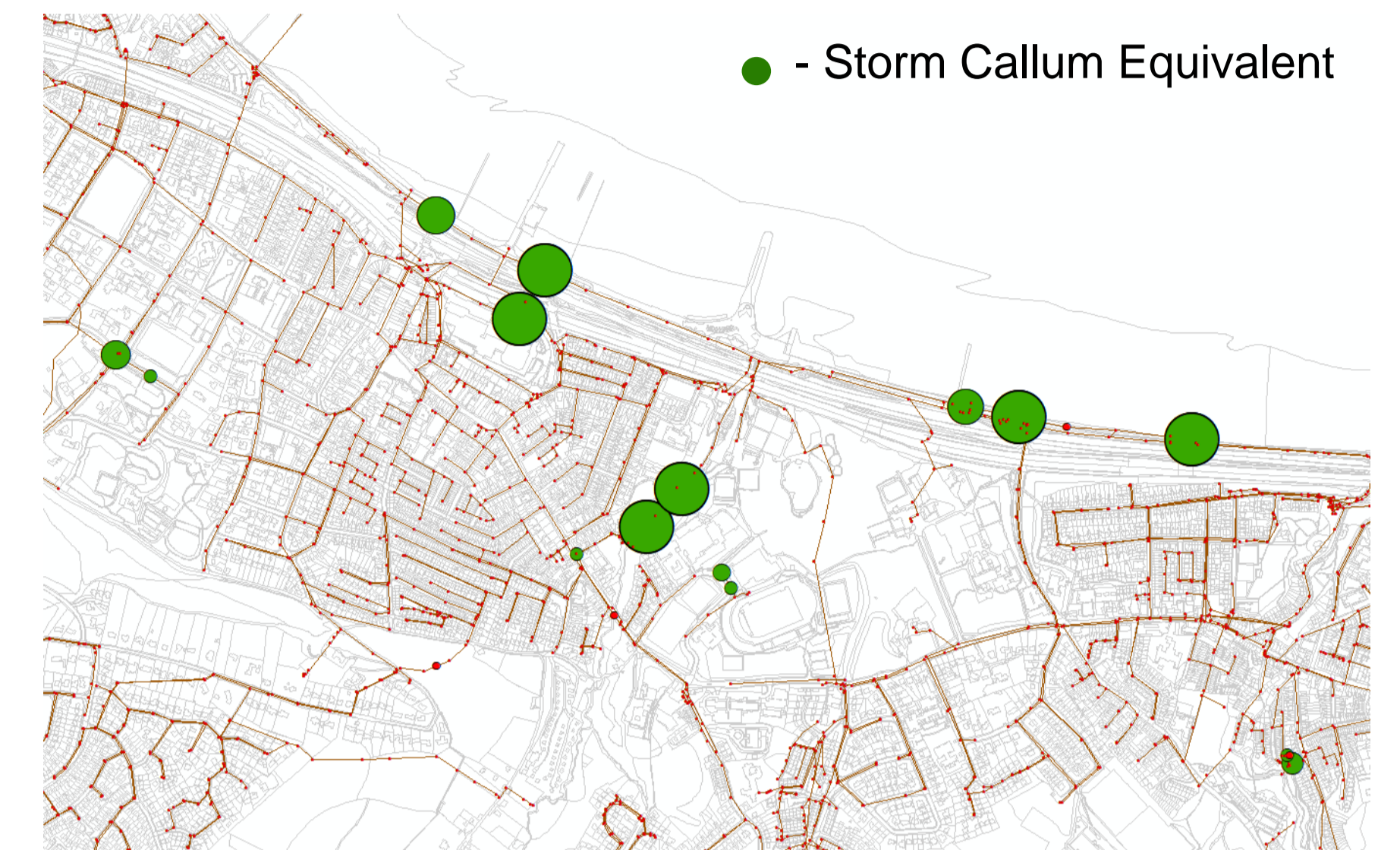
Ganol catchment localised flooding						
Node ID	Ref	Pre AMP 6	Pre AMP 6 2050	Post AMP 7 2050 with RainScape	Volume decreases between PreAMP 6 and Post AMP 7 2050	Percentage (%)
Colwyn Bay & Church Rd RainScape	1	2038.2	3789.1	393	1645.2	81%
	2	3368.1	4974.2	1945.5	1422.6	42%
	3	2601.5	5368.9	1800.5	801	31%
	4	1814.8	2168.3	430.1	1384.7	76%
	5	13259	15280.2	10163.2	1384.7	23%
	6	184.4	253.6	0.1	184.3	100%
	7	16609	19021.7	13517.2	3091.8	19%

This flooding assessment concludes that the Ganol catchment as a whole will struggle to cope with the effects of climate change + growth. However, these effects can be mitigated in the areas in which RainScape or other Welsh Water schemes are proposed (e.g. Colwyn Bay).

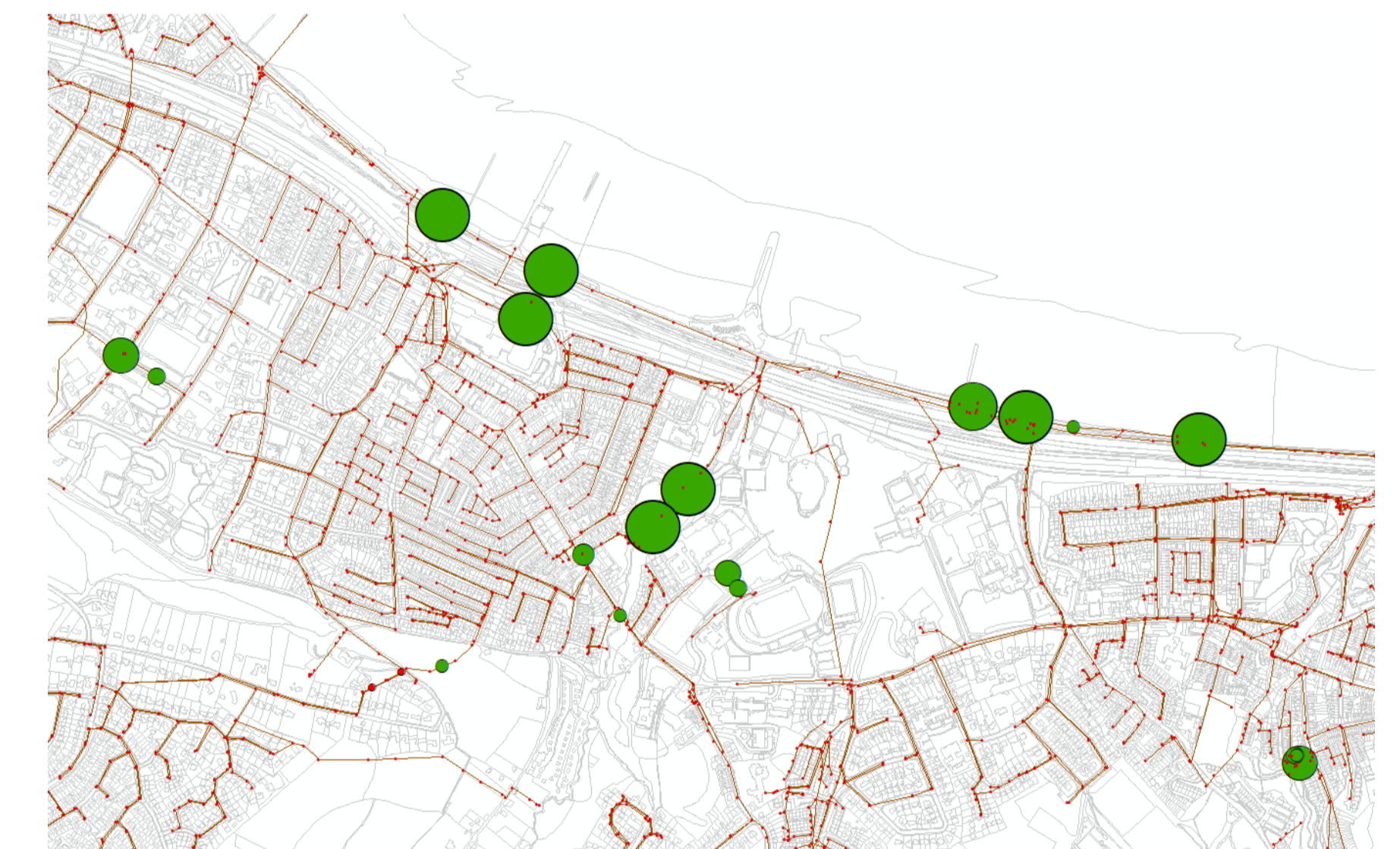
Storm Flood Effects

Below shows the 1D sewer flood volumes > 20m³.

Pre-AMP6 Scenario



Pre-AMP6 Scenario with Climate Change 2050



Post-AMP7 Scenario with Climate Change 2050 with RainScape

