## Met Office

## Strong winds and flooding from storm Angus, November 2016

The first named storm of the 2016-2017 season brought some damaging winds to the south coast, accompanied by heavy rain causing flooding mainly across parts of south-west England.

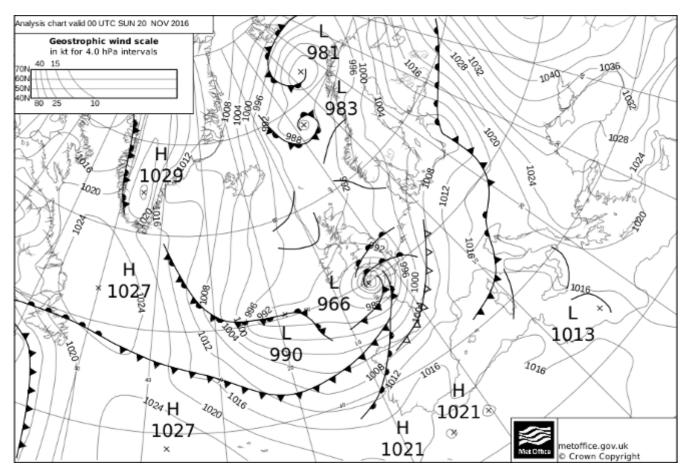
Gusts in exposed coastal locations reached 60 to 70 Kt (69 to 81 mph). Storm Angus brought 40 to 50mm of rain across the wettest areas, with a further 40 to 50mm from the next low pressure system 36 hours later falling on saturated ground and causing significant flooding problems.

## Impacts

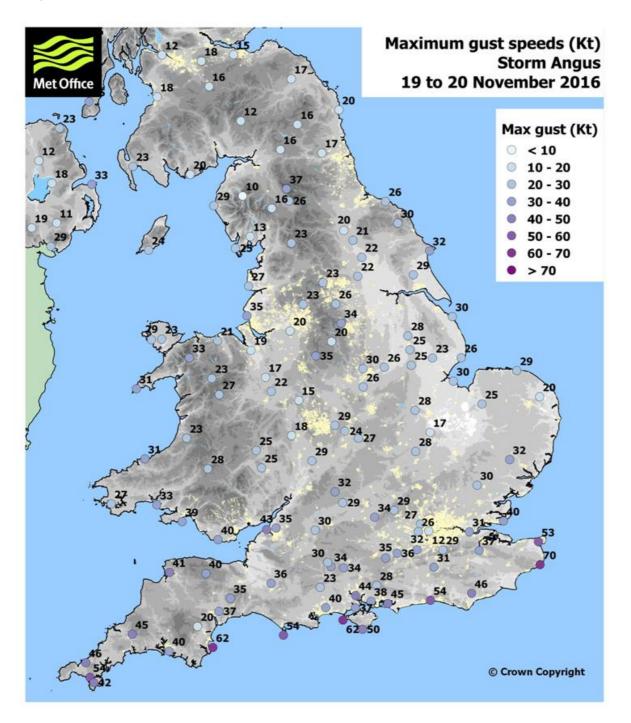
A cargo ship collided with a barge in the English Channel and a ferry carrying 150 passengers was stranded for 26 hours before docking at Fishguard, Pembrokeshire. Large waves battered the south coast and damage was reported to the sea wall at Swanage, Dorset. The south-west main line railway was closed outside Exeter due to flood damage and more than 1,000 properties across south-west England were without power. There was widespread travel disruption with roads closed and trains cancelled. Parts of South Wales were also affected by flooding. Further north, cars were stranded by heavy snow across parts of northern England.

## Weather data

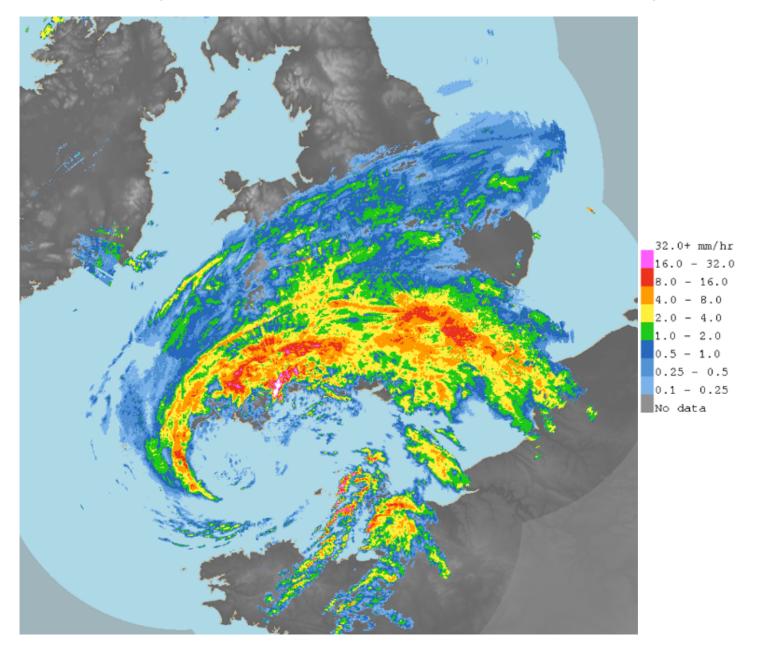
The analysis chart for 0000 GMT on 20 November shows storm Angus bringing heavy rain across southern areas and damaging winds to the south coast.



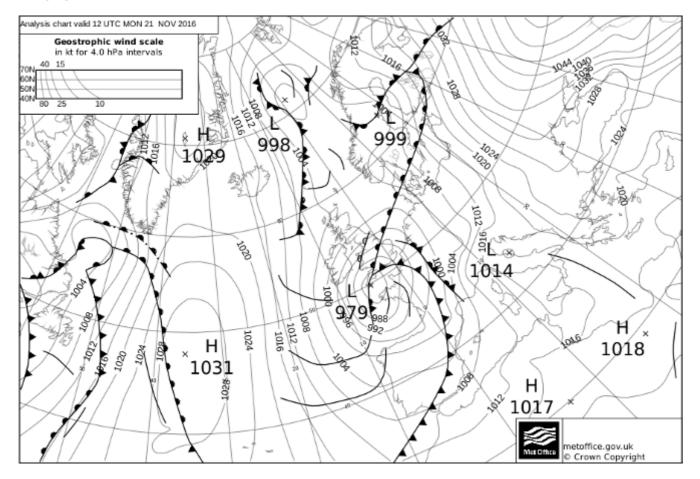
The figure below shows maximum gust speeds (Kt) from storm Angus on 19 and 20 November. Gusts along the south coast exceeded 50 Kt (58 mph) and were strongest in the far south-east with 70 Kt (81 mph) at Langdon Bay, Kent and 73 Kt (84 mph) at Guernsey Airport, Channel Islands.



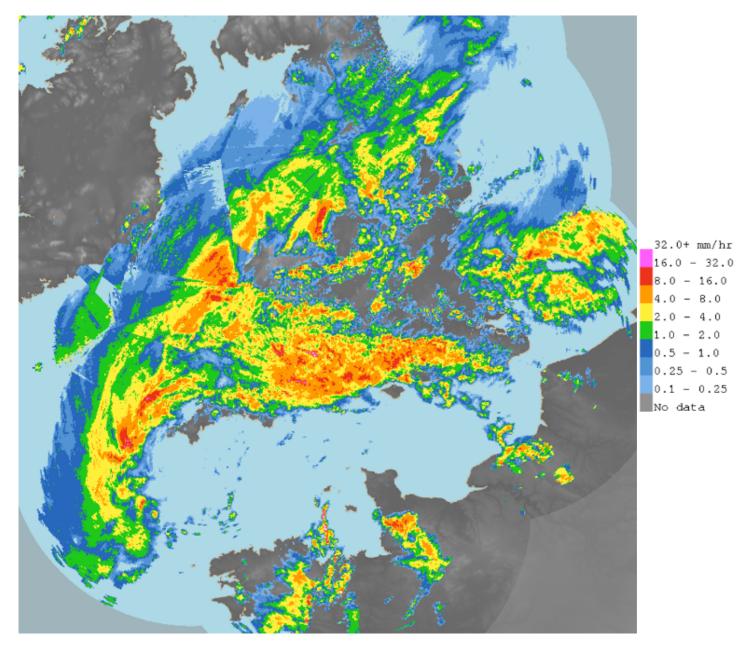
The radar-rainfall image below at 0030 GMT on 20 November shows heavy rainfall from storm Angus.



The analysis chart for 1200 GMT on 21 November – 36 hours later – shows the next low pressure system bringing further heavy rainfall.



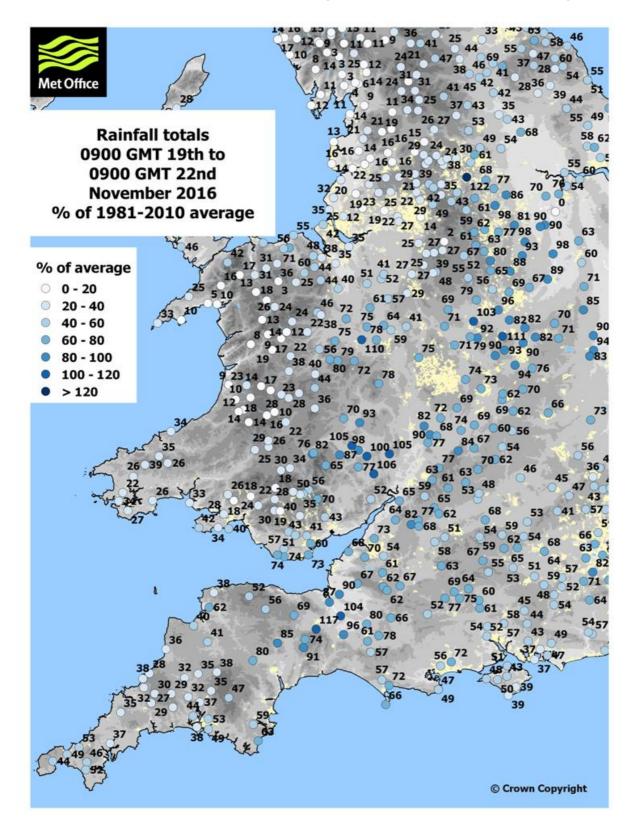
The radar-rainfall image below at 1230 GMT on 21 November shows the heavy rainfall from the next low pressure system, with the rainfall pattern very similar to that of Angus.



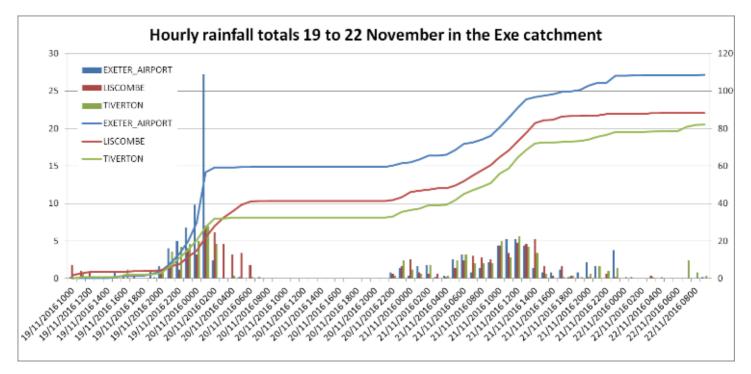
The map below shows overall rainfall totals for the 3-day period from 0900 GMT 19 to 0900 GMT 22 November. The highest totals were across parts of East Devon, Somerset, and South Wales which received over 100 mm in a few locations.

51 34 35 36 38 31 25 52 30 59 720 47 63 27 29 Met Office 26 32 49 41 60 45 26 24 41 41 32 **Rainfall totals** 43 27 35 46 38 21 33 35 31 36 362 0900 GMT 19th to 2430 26 41 38 3 0900 GMT 22nd 15 20 26 14 20 45 55 44 37 35 3 November 2016 42 22 31 30 27 48 48 39 1827 33 25 59 59 0 39 45 30 22 13 1817 2312 49 3: 65 66 50 Rainfall (mm) 47 29 26 36 56 70 54 46 0 - 20 36 22 21 24 32 51 33 32 26 4754 61 60 53 24 39 49 0 20 - 40 30 37 36 53 49 26 34 3: 40 40 - 60 45 39 22 20 21 3453 55 <sup>50</sup> 45 0 39 47 53 60 - 80 29 48 38 32 26 48 5042 55 44 40 46 36 28 5161 80 - 100 48 45 35 45 43 49 57 > 100 75 48 52 43 40 45 52 75 47 55 45 56 56 55 25 48 35 46 45 48 27 70 63 44 44 61 60 48 44 53 45 44 51 46 52 54 26 56 47 49 38 59 50 51 66 65 51 42 32 41 38 43 62 3918 46 73 43 2341 36 63 45 69 47 54 39 49 40 49 38 38 40 37 39 36 32 26 46 56 26 82 51 10 29 55 30 47 56 38 35 37 67 63 2! 46 23 33 66 67 48 69 79 68 35 32 47 49 45 60 99 74 35 26 33 22 57 30 48 5977 5663 33 27 45 53 40 74 100 36 4137 29 56 51 48 53 58 57 27 38 56 62 57 035 62 53 32 75 11371 47 40 5263 58 49 36 39 44 52 34 36 68 88 30-39 54 7768 66 62 7443 40 41 60 46 39 6573 45 39 42 43 74 63 72 40 49 71 53 49 45 64 51 46 75 69 55 63 59 55 46 40 42 45 69 78 60 54 58 54 6 50 61 59 61 117 66 56 56 54 46 57 53 49 63 90 86 66 5759 71 63 88 54 57 113 72 58 56 49 62 55 56 59 6190 66 86 52 43 60 47 8682 79 59 44 51 74 58 66 32 59 73 59 0103 106 80 46 65 58 108 91 71 A 52 109 59 68 48 17 38 85 50 30 54 69 47 © Crown Copyright

The map below shows these rainfall accumulations as a percentage of the 1981-2010 long term average November rainfall, with some locations receiving more than the whole month's average rainfall in this period.



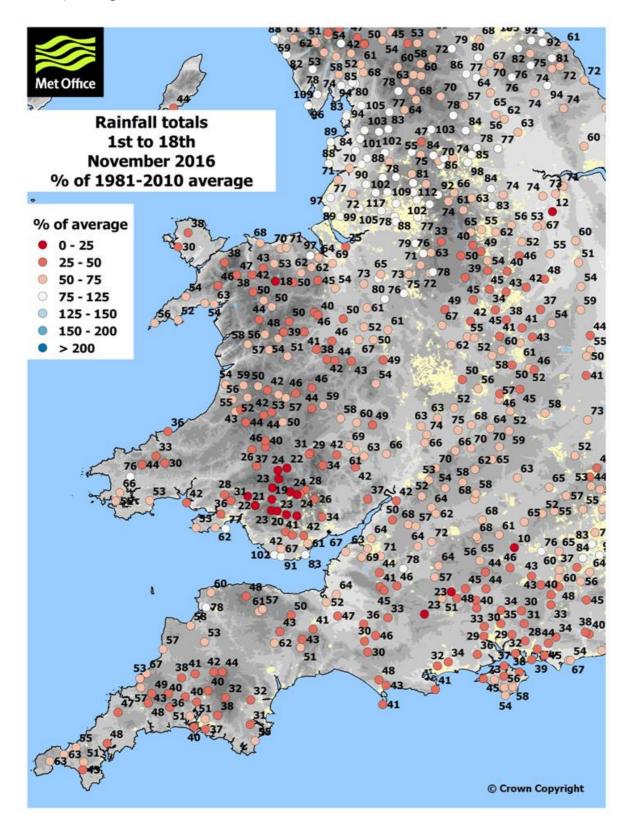
The figure below shows hourly rainfall totals and accumulations from storm Angus and the subsequent low pressure system at Exeter Airport and Tiverton (Devon) and Liscombe (Somerset) – all located within the catchment of the River Exe where significant disruption from flooding occurred. Exeter Aiport recorded 27.2 mm in one hour to 0100 GMT on 20 November, associated with the white area of most intense rainfall shown on the radar-rainfall image above.

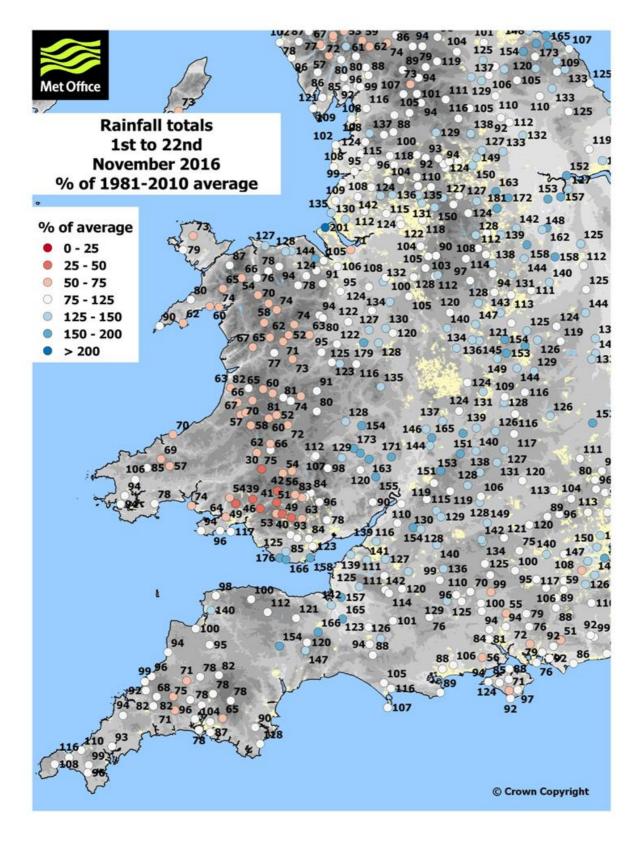


The table gives rainfall totals in mm at these locations during the two storms, together with the November 1981-2010 long term average. (Liscombe, located on Exmoor, is a climatologically much wetter location).

Period	Exeter Airport	Tiverton	Liscombe
0900 GMT 19th to 0900 GMT 22nd	108.6	82.2	88.2
Angus: 1800 GMT 19th to 0700 GMT 20th	58.0	30.6	37.2
Next low: 2100 GMT 20th to 2300 GMT 22nd	48.8	45.4	46.6
November 1981-2010 long-term average	83.4	96.5	159.0

The maps below compare rainfall anomalies for 1 to 18 November against 1 to 22 November 2016. Before the arrival of storm Angus, November had been a relatively dry month with many locations receiving around half the November long-term-average rainfall. This subsequently increased to betwen 100 and 150% of the monthly average.





Last updated: 28 November 2016

