Monthly water situation report

Devon and Cornwall Area

Summary – October 2017

The rainfall that fell in October was 'below normal' for the time of year (65% of long term average). Overall, the soil moisture deficit decreased slightly over the month. Monthly mean river flows at all sites in Devon were classed as 'normal'. All sites in Cornwall were classed as 'above normal' with the exception of the Hayle which was 'notably high'. The groundwater level at Whitlands receded over the month but remains 'normal' for the time of year. Bussels No7A receded over the month and is now classed as 'notably low'. Woodleys No1 continued to recede over the month and is classed as 'notably low'. Overall, reservoir storage has increased slightly from 76% to 77%.

Rainfall

Overall, rainfall was 'below normal' across Devon and Cornwall. All rainfall catchments were classed as 'below normal' with the exception of North Cornwall and Seaton, Looe and Fowey which were classed as 'normal'. Rainfall ranged between 52% (Teign and Torbay) and 78% (Seaton, Looe and Fowey) of long term average for each rainfall catchment. Over half the month's rainfall fell over 4 consecutive days in the middle of the month.

Rainfall maps and graph

Soil Moisture Deficit

Overall, the soil moisture deficit has decreased slightly since the end of September. The deficit gradually increased over the first half of the month before decreasing rapidly, reflecting the period of rainfall in the middle of the month, before returning to approximately the same deficit as the beginning of the month.

SMD graph and map

River Flows

The monthly mean river flows show a distinct divide between east and west. All of the sites in Devon were classed as 'normal' whilst the sites in Cornwall were 'above normal'; the exception to this was the Hayle which was 'notably high'. At the end of the month, daily mean flows are 'normal' for all sites except the Otter at Dotton which is 'below normal'. Daily flows for most sites show a gradual decrease in flows over the month, with a peak just after the middle of the month which reflects the rainfall across the area.

River flow map and graphs

Groundwater Levels

The groundwater level at Whitlands gradually decreased over the month but still remains 'normal' for the time of year. Bussels No7A receded over the month and is now classed as 'notably low'. Woodleys No1 continued to recede over the month and is still classed as 'notably low'.

Groundwater map and graphs

Reservoir Storage

Overall, reservoir storage has increased very slightly from 76% to 77%. Wimbleball has decreased from 57% to 53% whilst Colliford and Roadford both saw increases (81% to 84% and 71% to 74% respectively).

Reservoir graphs
Glossary

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Rainfall

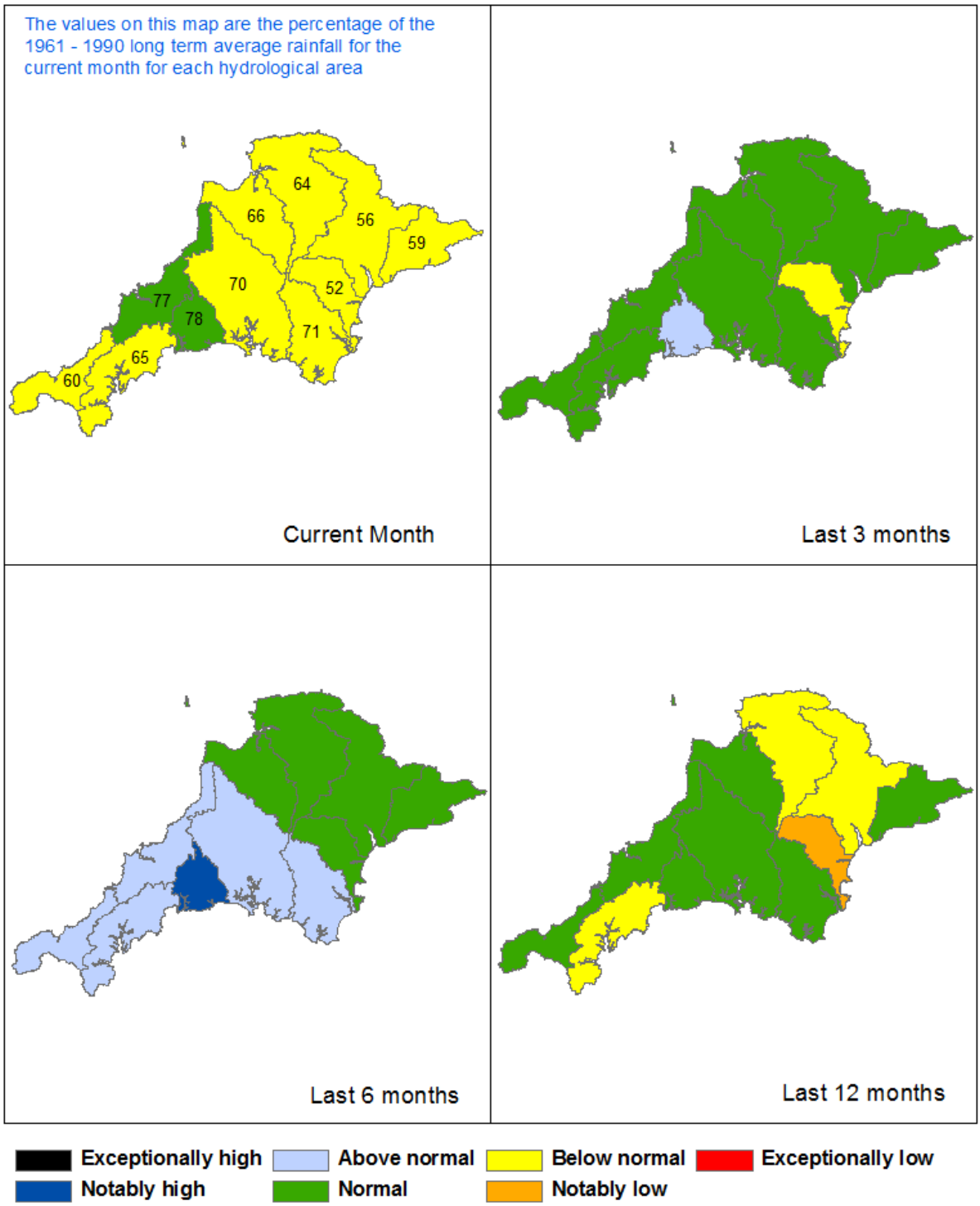

Figure 1.1: Total rainfall for hydrological areas across Devon and Cornwall for the current month, the last three months, the last six months and the last 12 months, classed relative to an analysis of respective historic totals. Final NCIC (National Climate Information Centre) data based on the Met Office 5km gridded rainfall dataset derived from rain gauges (Source: Met Office © Crown Copyright, 2017). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100026380, 2017.

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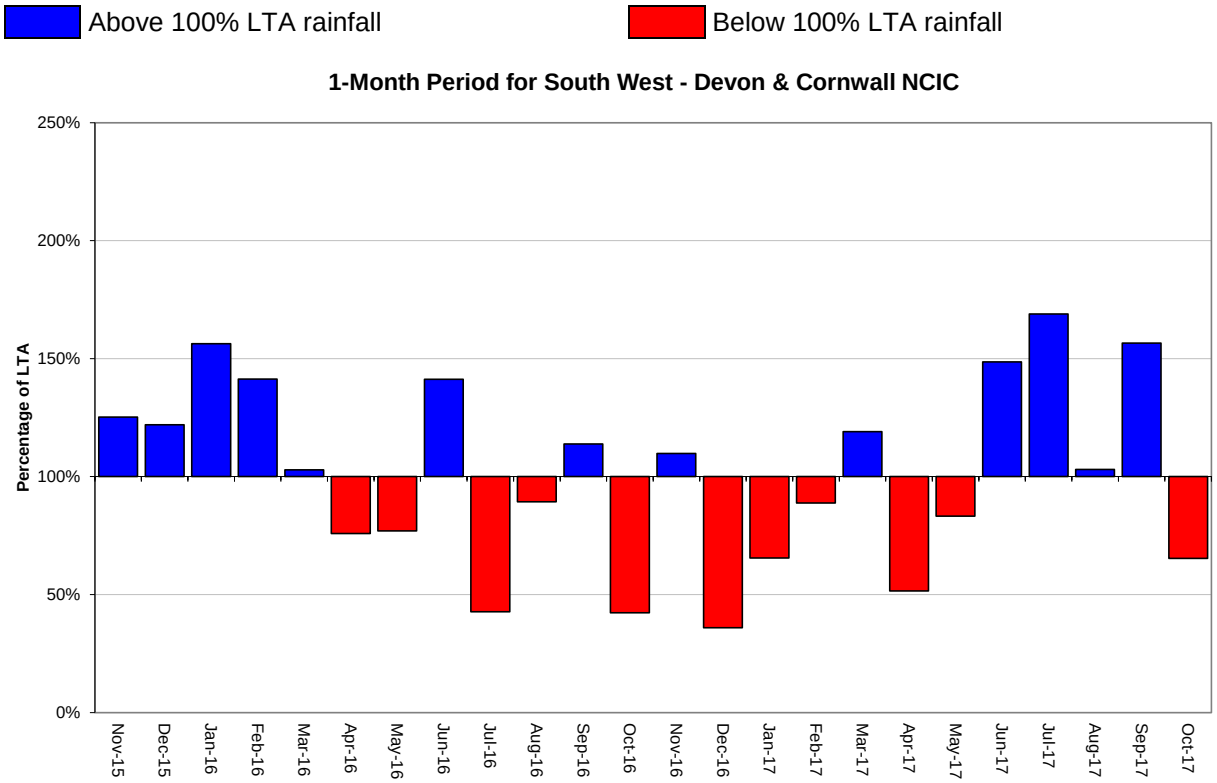

Figure 1.2: Monthly rainfall totals as a percentage of the 1961 – 1990 long term average. Final NCIC (National Climate Information Centre) data based on the Met Office 5km gridded rainfall dataset derived from rain gauges (Source: Met Office © Crown Copyright, 2017). Provisional data based on Environment Agency 1km gridded rainfall dataset derived from Environment Agency intensity rain gauges. Crown copyright. All rights reserved. Environment Agency, 100026380, 2017.

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Soil Moisture Deficit

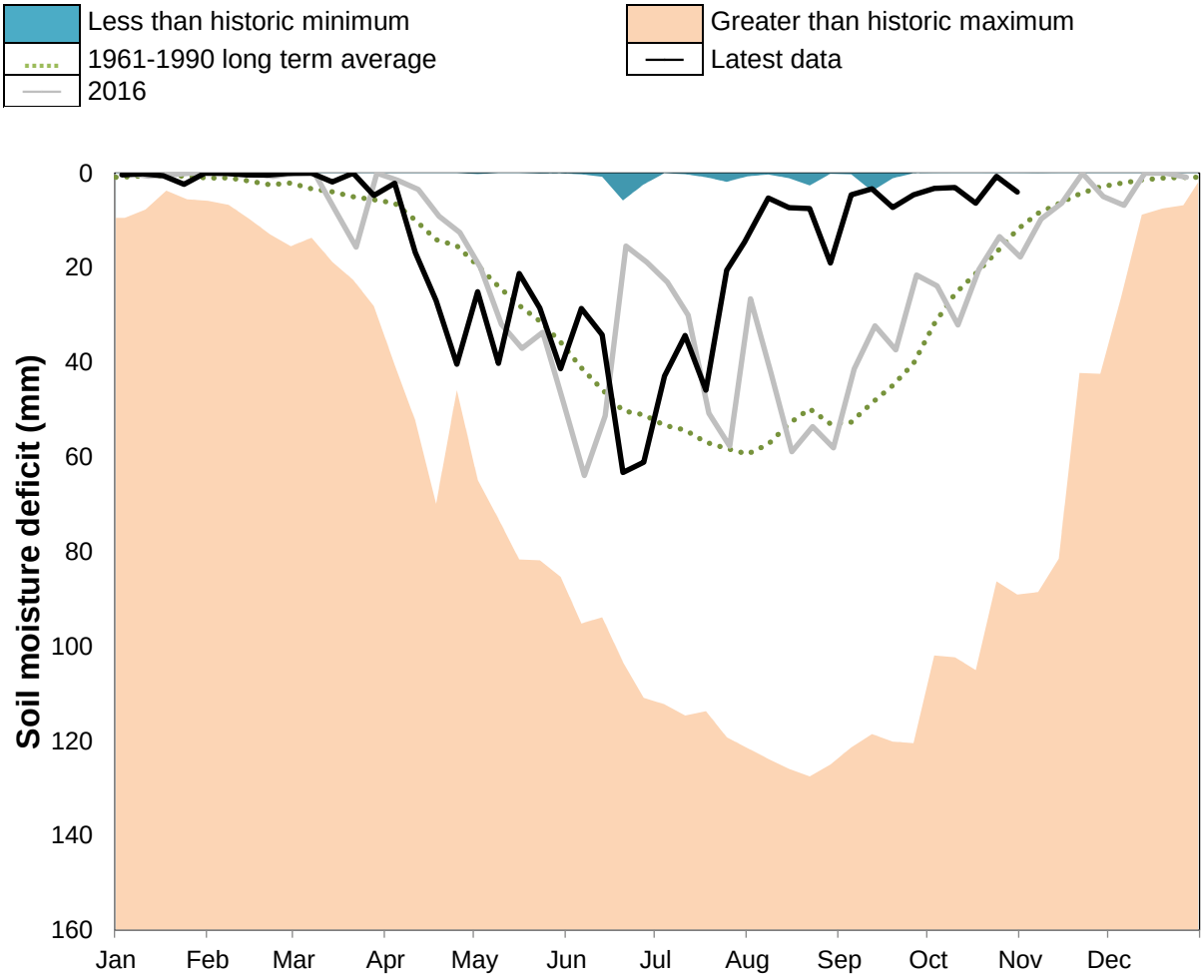

Figure 2.1: Latest soil moisture deficit compared to previous year, maximum, minimum and 1961 – 1990 long term average. Weekly MORECS data for real land use (Source: Met Office © Crown Copyright, 2017).

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Month-end Soil Moisture Deficit (mm)

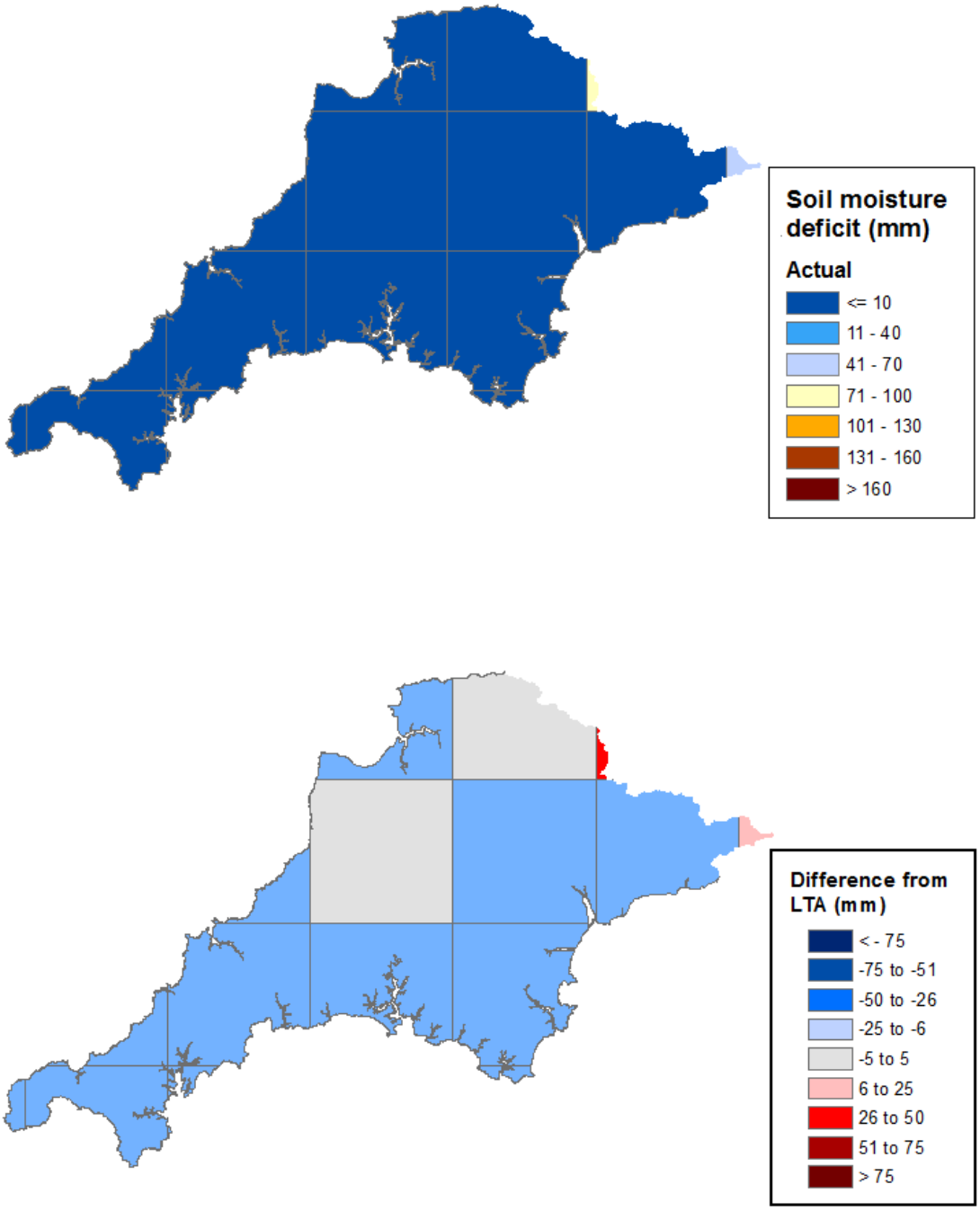

Figure 2.2: Soil moisture deficits for week ending 3rd November 2017. MORECS data for real land use (Source: Met Office © Crown Copyright, 2017). Crown copyright. All rights reserved. Environment Agency, 100026380, 2017.

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River Flow

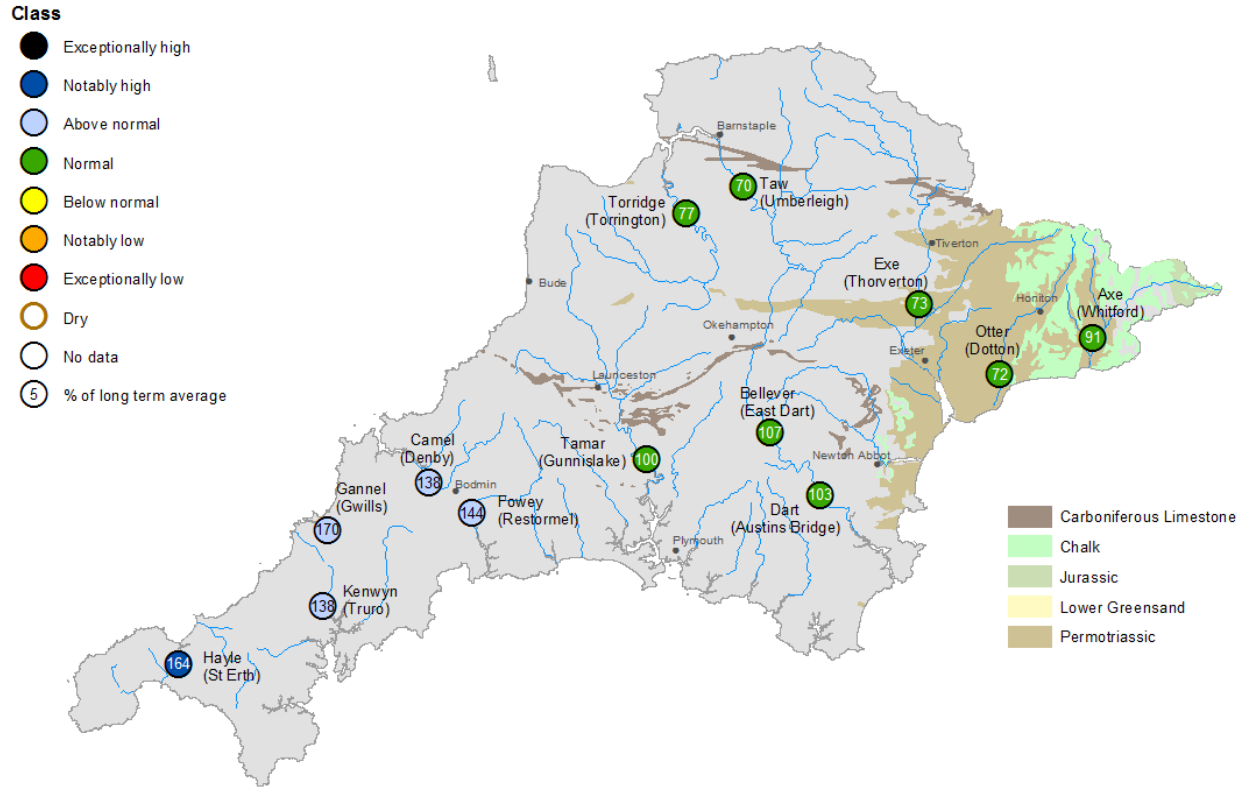
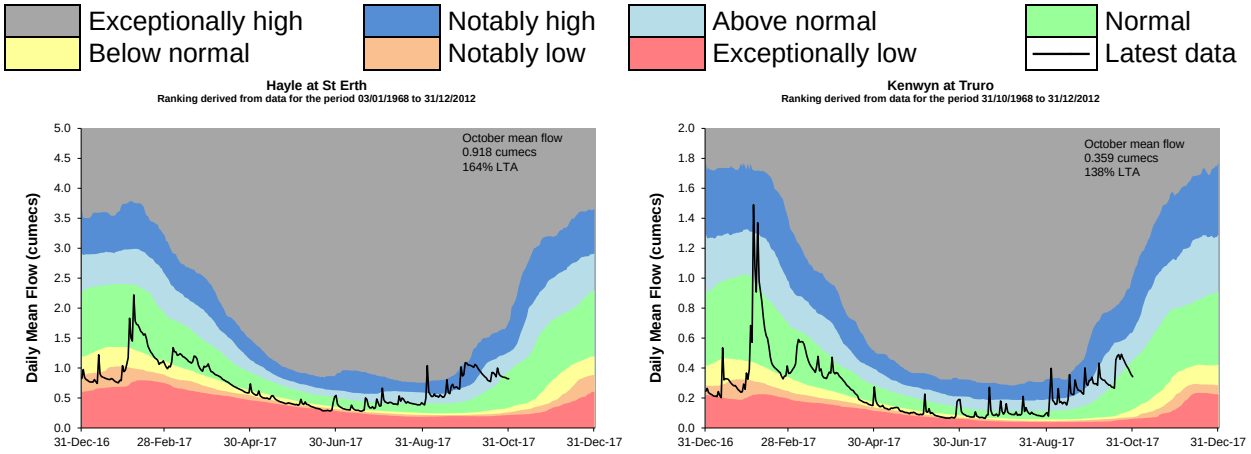


Figure 3.1: Monthly mean river flows at indicator sites for October 2017, expressed as a percentage of the respective long term average and classed relative to an analysis of historic October monthly means (Source: Environment Agency). Crown copyright. All rights reserved. Environment Agency, 100026380, 2017.



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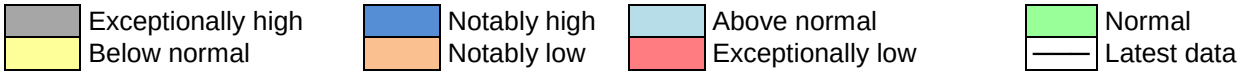
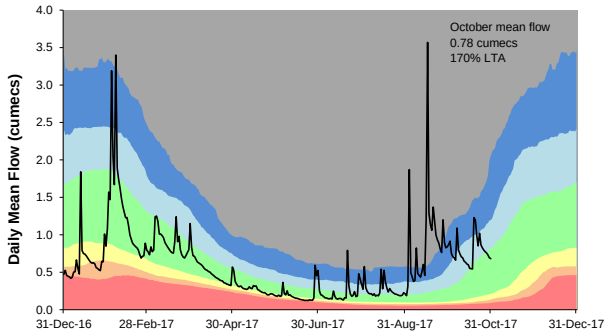
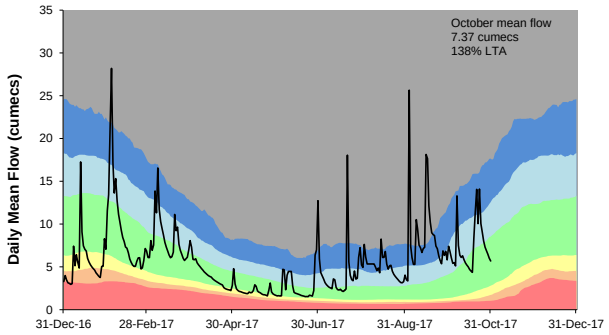


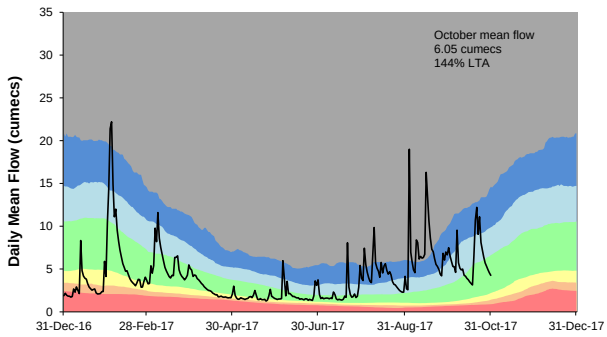
Gannel at Gwills
Ranking derived from data for the period 01/12/1969 to 31/12/2012



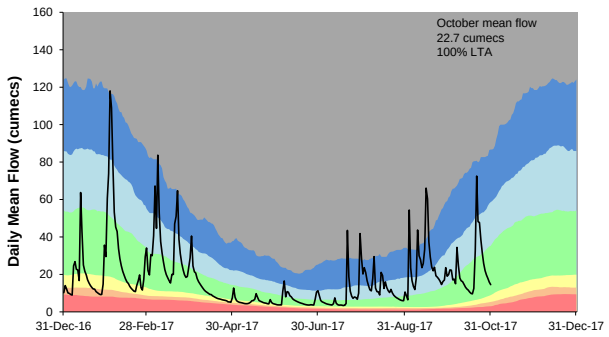
Camel at Denby
Ranking derived from data for the period 31/08/1964 to 31/12/2012



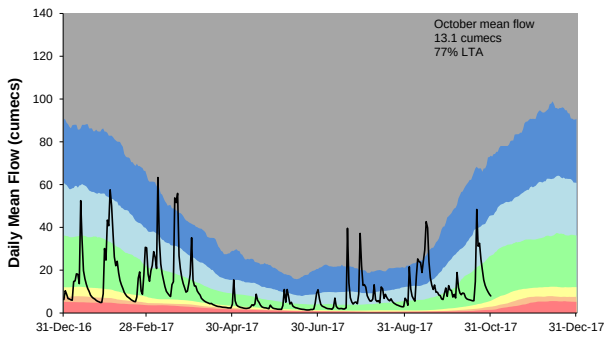
Fowey at Restormel
Ranking derived from data for the period 31/03/1961 to 31/12/2012



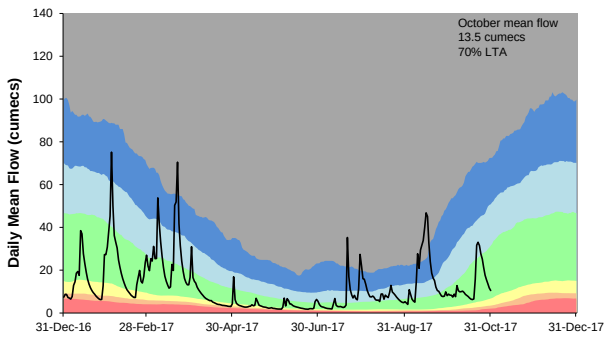
Tamar at Gunnislake
Ranking derived from data for the period 25/06/1956 to 31/12/2012



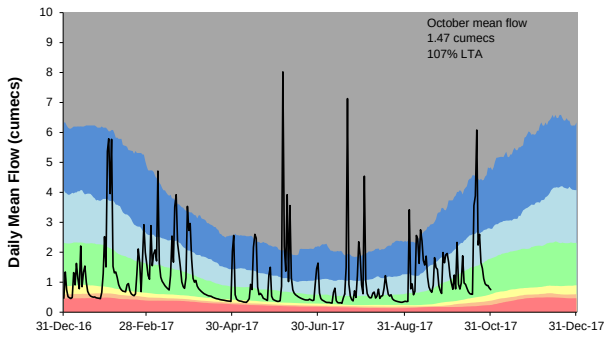
Torridge at Torrington
Ranking derived from data for the period 31/07/1960 to 31/12/2012



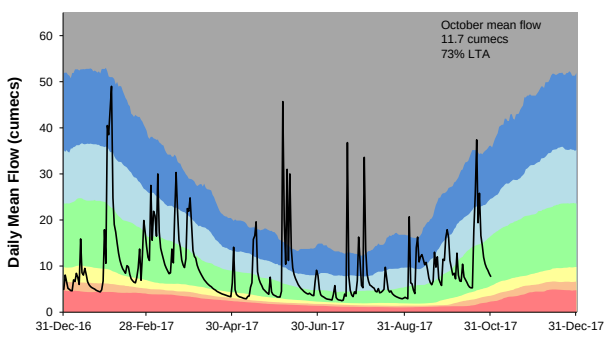
Taw at Umberleigh
Ranking derived from data for the period 30/09/1958 to 31/12/2012



East Dart at Bellever
Ranking derived from data for the period 31/03/1964 to 31/12/2012



Dart at Austins Bridge
Ranking derived from data for the period 30/09/1958 to 31/12/2012



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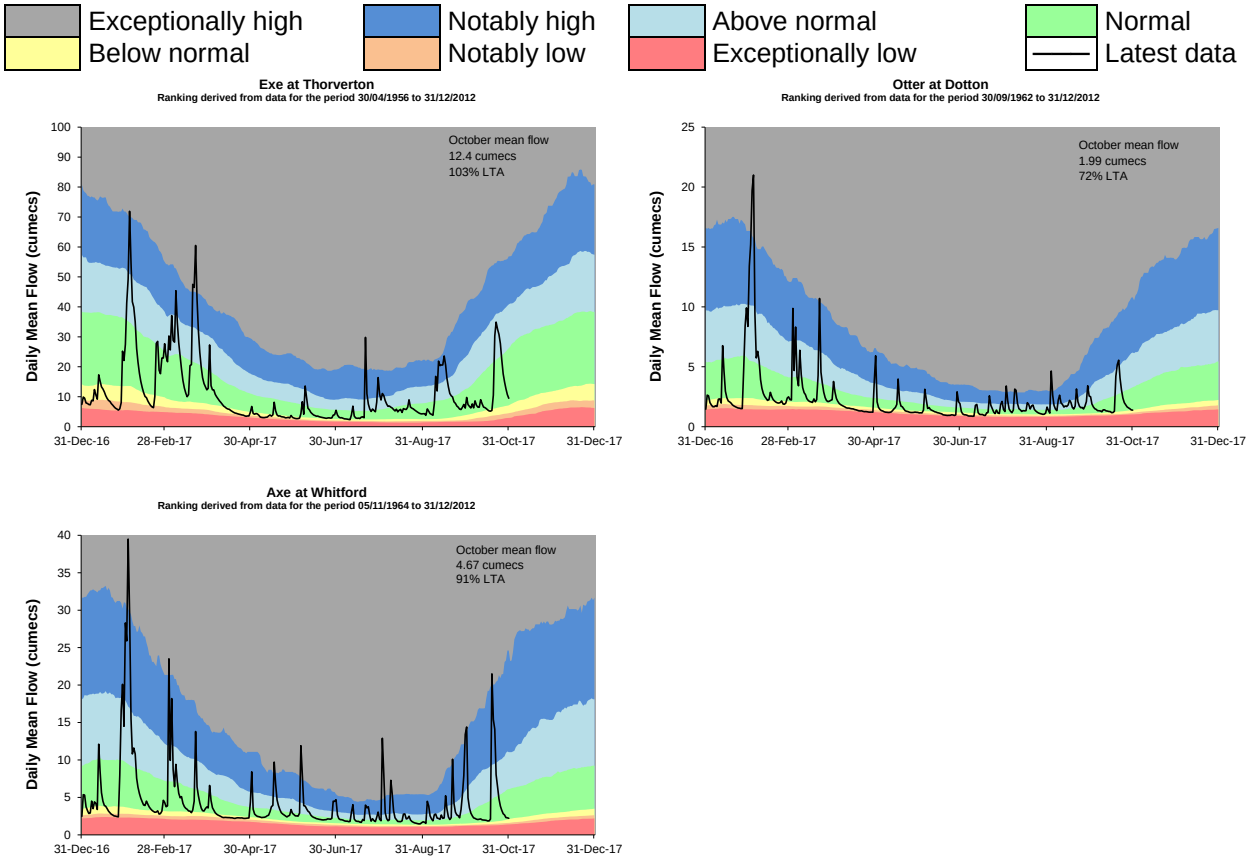

Figure 3.2: Indicator river flow sites for Devon and Cornwall. Daily mean flow compared to an analysis of historic daily mean flows. (Source: Environment Agency).

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Groundwater Levels

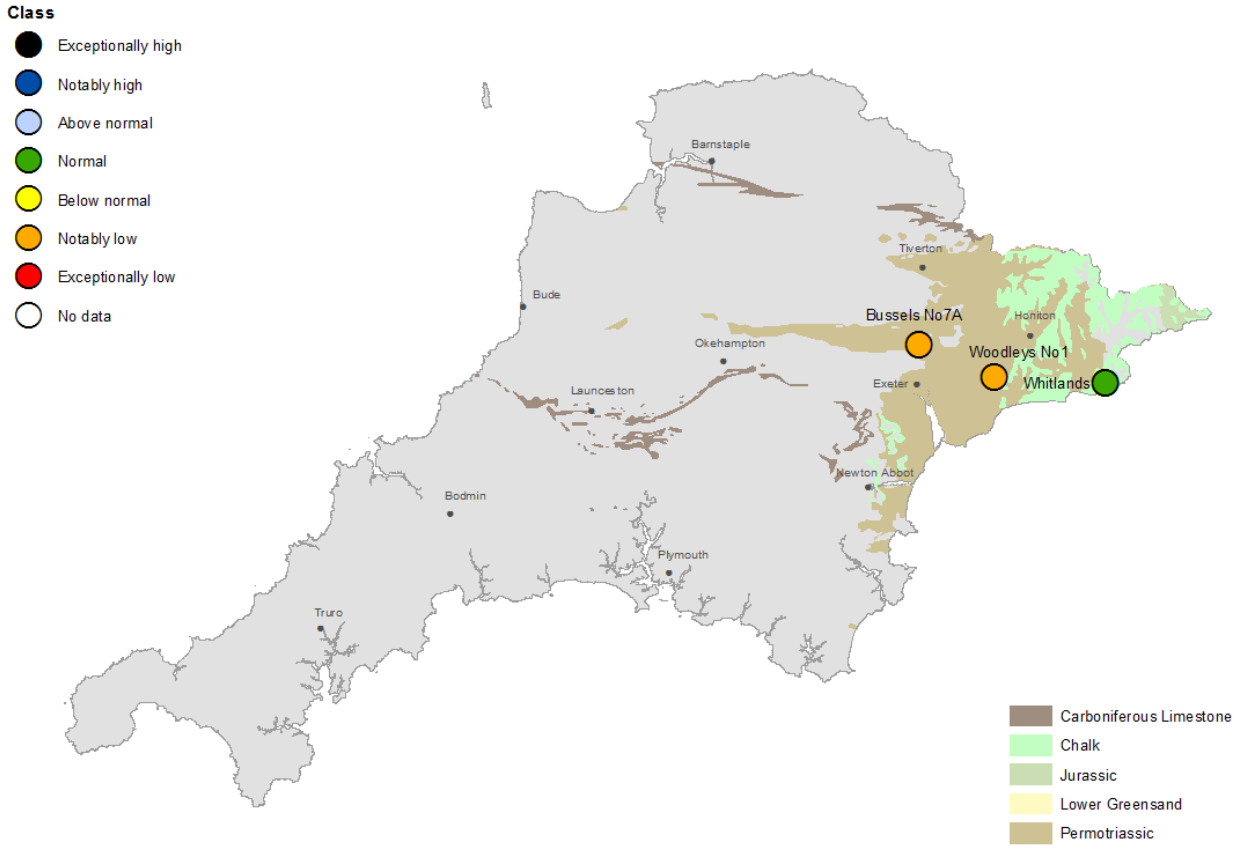
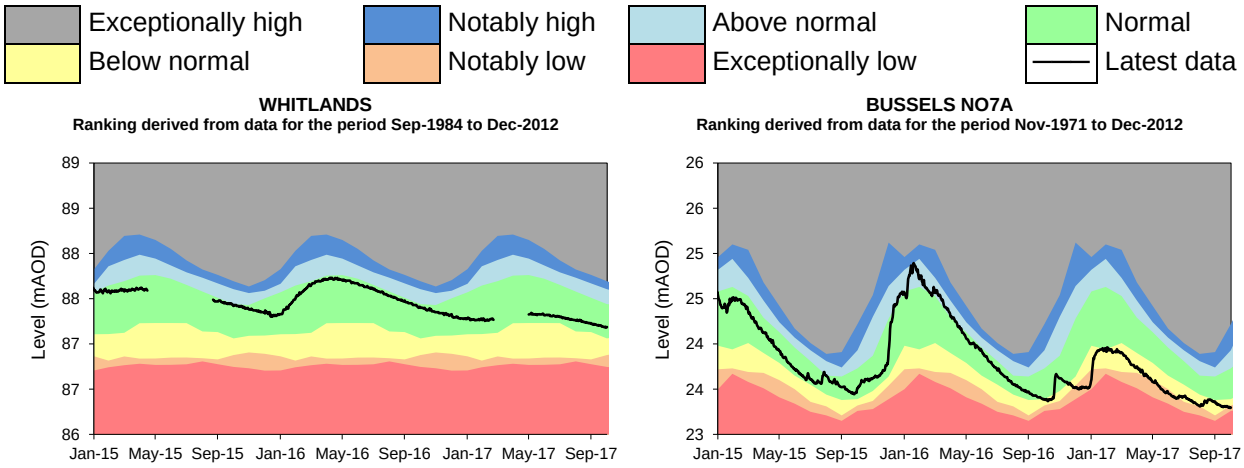


Figure 4.1: Groundwater levels for indicator sites at the end of October 2017, classed relative to an analysis of respective historic October levels (Source: Environment Agency). Geological map reproduced with permission from UK Groundwater Forum, BGS © NERC. Note: groundwater levels are reported at different times during the month and therefore may not be fully representative of levels at the month end. Crown copyright. All rights reserved. Environment Agency, 100026380, 2017.



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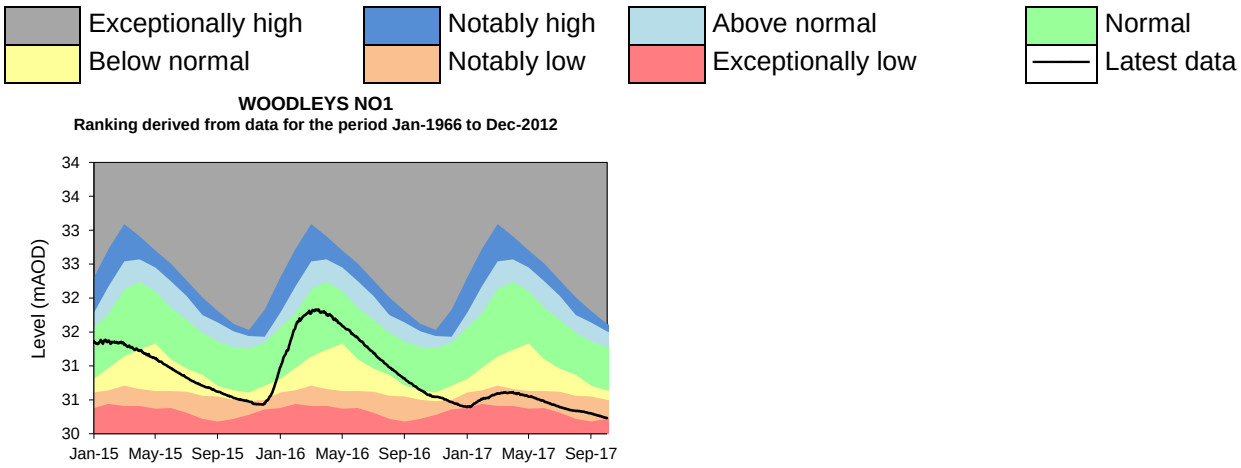

Figure 4.2: Indicator groundwater level sites for major aquifers. End of month groundwater levels compared to analysis of historic end month levels (Source: Environment Agency, 2017).

Reservoir Stocks

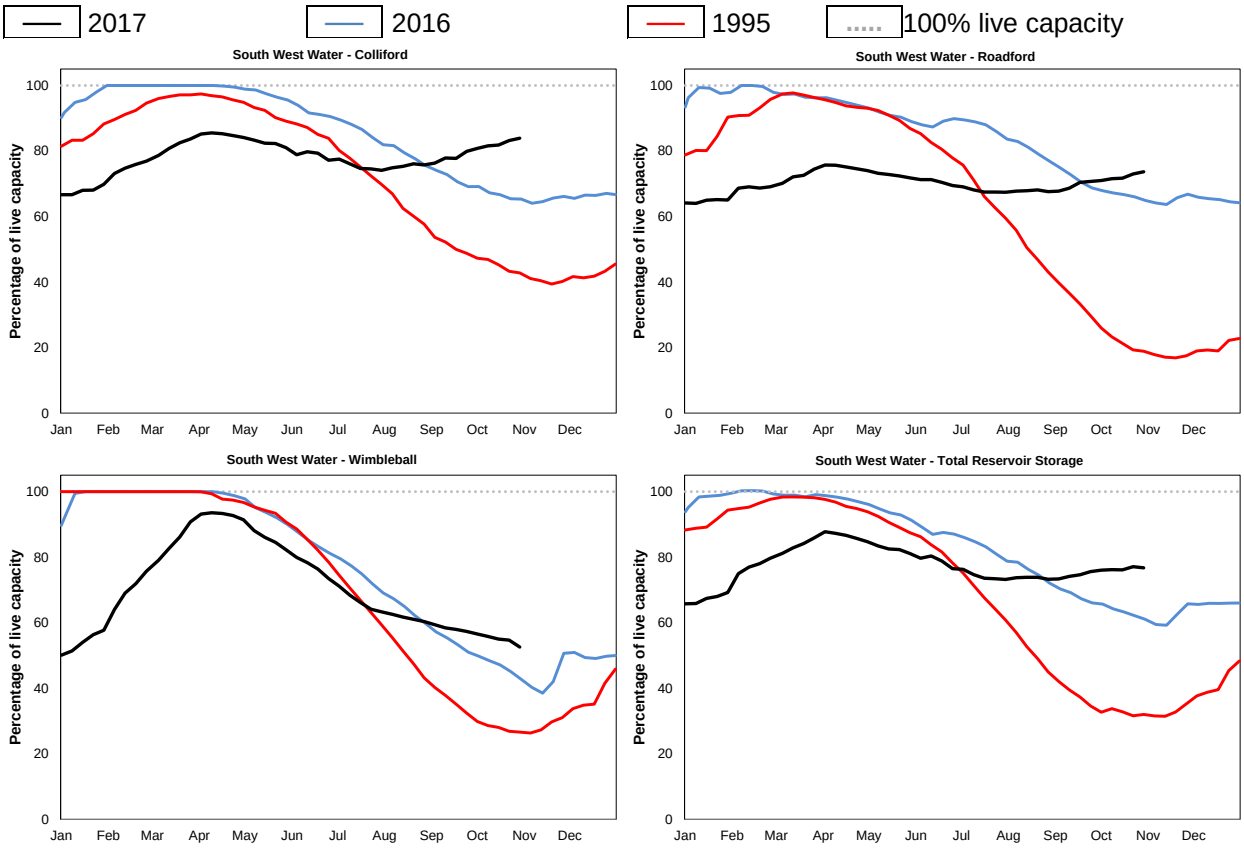

Figure 5.1: Reservoir stocks in Devon and Cornwall (Source: South West Water).

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Glossary

Term	Definition
Aquifer	A geological formation able to store and transmit water.
Areal average rainfall	The estimated average depth of rainfall over a defined area. Expressed in depth of water (mm).
Artesian	The condition where the groundwater level is above ground surface but is prevented from rising to this level by an overlying continuous low permeability layer, such as clay.
Artesian borehole	Borehole where the level of groundwater is above the top of the borehole and groundwater flows out of the borehole when unsealed.
Cumecs	Cubic metres per second (m^3s^{-1})
Effective rainfall	The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).
Flood Alert/Flood Warning	Three levels of warnings may be issued by the Environment Agency. Flood Alerts indicate flooding is possible. Flood Warnings indicate flooding is expected. Severe Flood Warnings indicate severe flooding.
Groundwater	The water found in an aquifer.
Long term average (LTA)	The arithmetic mean calculated from the historic record, usually based on the period 1961-1990. However, the period used may vary by parameter being reported on (see figure captions for details).
mAOD	Metres Above Ordnance Datum (mean sea level at Newlyn Cornwall).
MORECS	Met Office Rainfall and Evaporation Calculation System. Met Office service providing real time calculation of evapotranspiration, soil moisture deficit and effective rainfall on a 40 x 40 km grid.
Naturalised flow	River flow with the impacts of artificial influences removed. Artificial influences may include abstractions, discharges, transfers, augmentation and impoundments.
NCIC	National Climate Information Centre. NCIC area monthly rainfall totals are derived using the Met Office 5 km gridded dataset, which uses rain gauge observations.
Recharge	The process of increasing the water stored in the saturated zone of an aquifer. Expressed in depth of water (mm).
Reservoir gross capacity	The total capacity of a reservoir.
Reservoir live capacity	The capacity of the reservoir that is normally usable for storage to meet established reservoir operating requirements. This excludes any capacity not available for use (e.g. storage held back for emergency services, operating agreements or physical restrictions). May also be referred to as 'net' or 'deployable' capacity.
Soil moisture deficit (SMD)	The difference between the amount of water actually in the soil and the amount of water the soil can hold. Expressed in depth of water (mm).

Categories

Exceptionally high	Value likely to fall within this band 5% of the time
Notably high	Value likely to fall within this band 8% of the time
Above normal	Value likely to fall within this band 15% of the time
Normal	Value likely to fall within this band 44% of the time
Below normal	Value likely to fall within this band 15% of the time
Notably low	Value likely to fall within this band 8% of the time
Exceptionally low	Value likely to fall within this band 5% of the time

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Rainfall Catchments

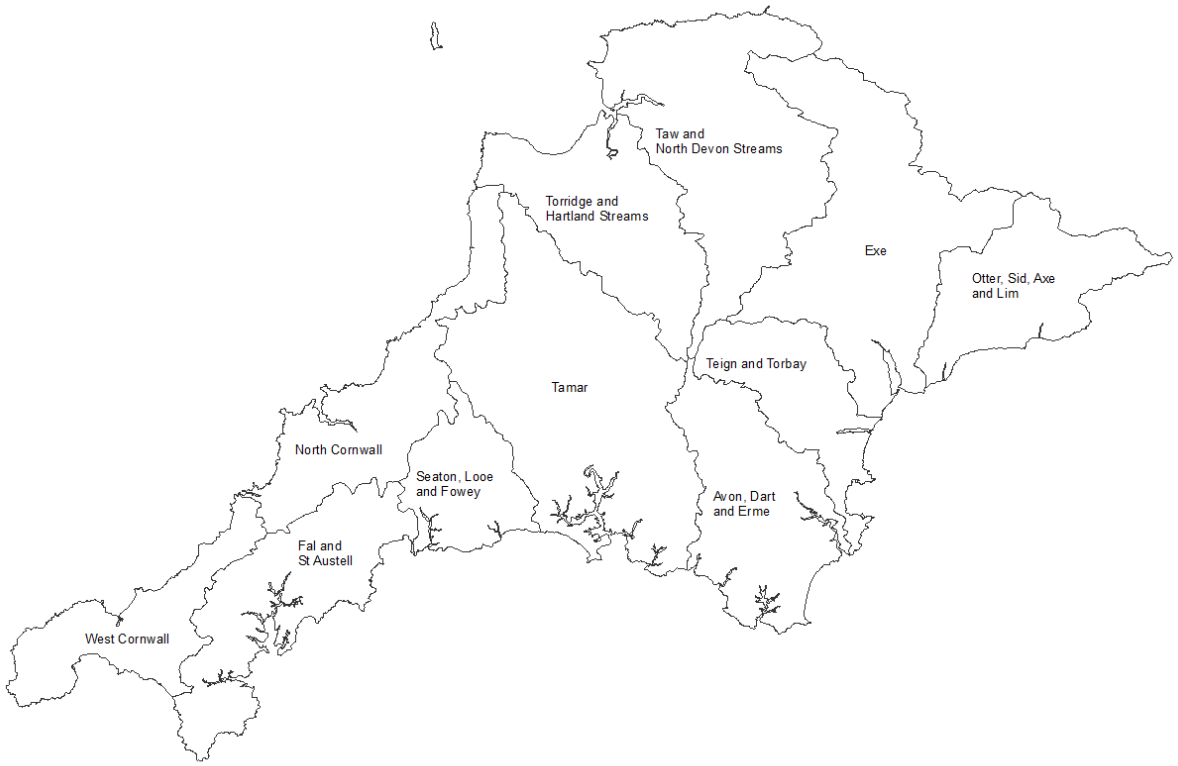

Figure 6.1: Rainfall catchments in Devon and Cornwall. Crown copyright. All rights reserved. Environment Agency, 100026380, 2017.

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