Monthly Water Situation Report March 2017

Natural Resources Wales

- **The monthly rainfall total for Wales during March was 151% of the Long Term Average (LTA, 1961-90). South East, South West and North Wales received 145%, 162% and 147% of the LTA, respectively.**
- **At the end of March, soil moisture deficit (SMD) values across Wales were from 0 to 9.5mm for all MORECS squares. Soil was slightly wetter than the LTA for most of the the squares except two squares for March.**
- **For river flows in Wales, 6 out of 30 indicator sites (which had flow data available) were classed as *Normal*, 17 were classed as *Above normal* and 7 sites were classed as *Notably high* for March.**
- **The overall cumulative reservoir storage across the indicator sites was greater than 94% except 1 reservoir (Usk) at the end of March and all reservoirs were within normal operating ranges.**

Rainfall*

The monthly rainfall total for Wales was 151% of the LTA for March. The percentage of rainfall recorded in catchments compared with the LTA across Wales was between 123% (Lower Wye) and 188% (North Ceredigion). The rainfall total for Wales was 56mm more than the March LTA. For South East, South West and North Wales the rainfall totals were 145%, 162% and 147% of LTA, respectively.

Rainfall Map	National			
Rainfall Charts	National & Areas	South East Wales	North Wales	South West Wales

* using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright)*

Soil Moisture Deficit/Recharge

All 23 MORECS squares had SMD values which were between 0 and 9.5mm. Soil was slightly wetter than the long term average for most of the squares except two squares (114 in the north area and 157 in the southeast area) for Match.

SMD Map	National
SMD Charts	Compare to LTA

River Flows

River flows were between normal and notably high for all the indicator sites across Wales. 6 sites (out of 30 sites which had flow data) were classed as *Normal* and 17 were classed as *Above normal*. The remaining 7 sties were classed as *Notably high*..

***South East*:** Flows in the area ranged from 94% (River Monnow at Grosmont) to 142% (River Yscir at Pont ar Yscir) of the March LTA values.

South West: The river flows within this area ranged from 104% (River Cleddau at Treffgarne) to 194% (River Ystwyth at Pont Llolwyn) of the March LTA values.

***North*:** Flows in the area ranged from 129% (River Alwen at Druid) to 174% (River Dwyfor at Garndolbenmaen) of the March LTA Values.

River Flow Map	National
River Flow Table	% of LTA and compare to previous year
River Flow Charts	South East Wales North Wales South West Wales

Groundwater Levels

Groundwater levels for March at all indicator sites (10 sites) were classed between *Notably low* (Eastwick) to *Above normal (*Dodleston and Greenfield Garage). 4 sites were classed as *Normal* (Pant-y-Lladron, Fernbank, Hollybush and Broxton) and 3 sites were classed as *Below normal* (Pont y Cambwll, Llanfair DC and Handley).

Groundwater Map	National
Groundwater Charts	South East Wales North Wales South West Wales

Reservoir Storage

At the end of March most of the indicator reservoirs (17 out of 18) were greater than 94% full and were in normal range for the time of year. However, the Usk reservoir was 78% full due to maintenance work being carried out on this reservoir. But it was still in the normal range for the time of year.

Reservoir Charts	South East Wales North Wales South West Wales

All data on Water Situation Reports are provisional, based on spot readings, and are subject to revision.

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Return to Summary

Natural Resources Wales

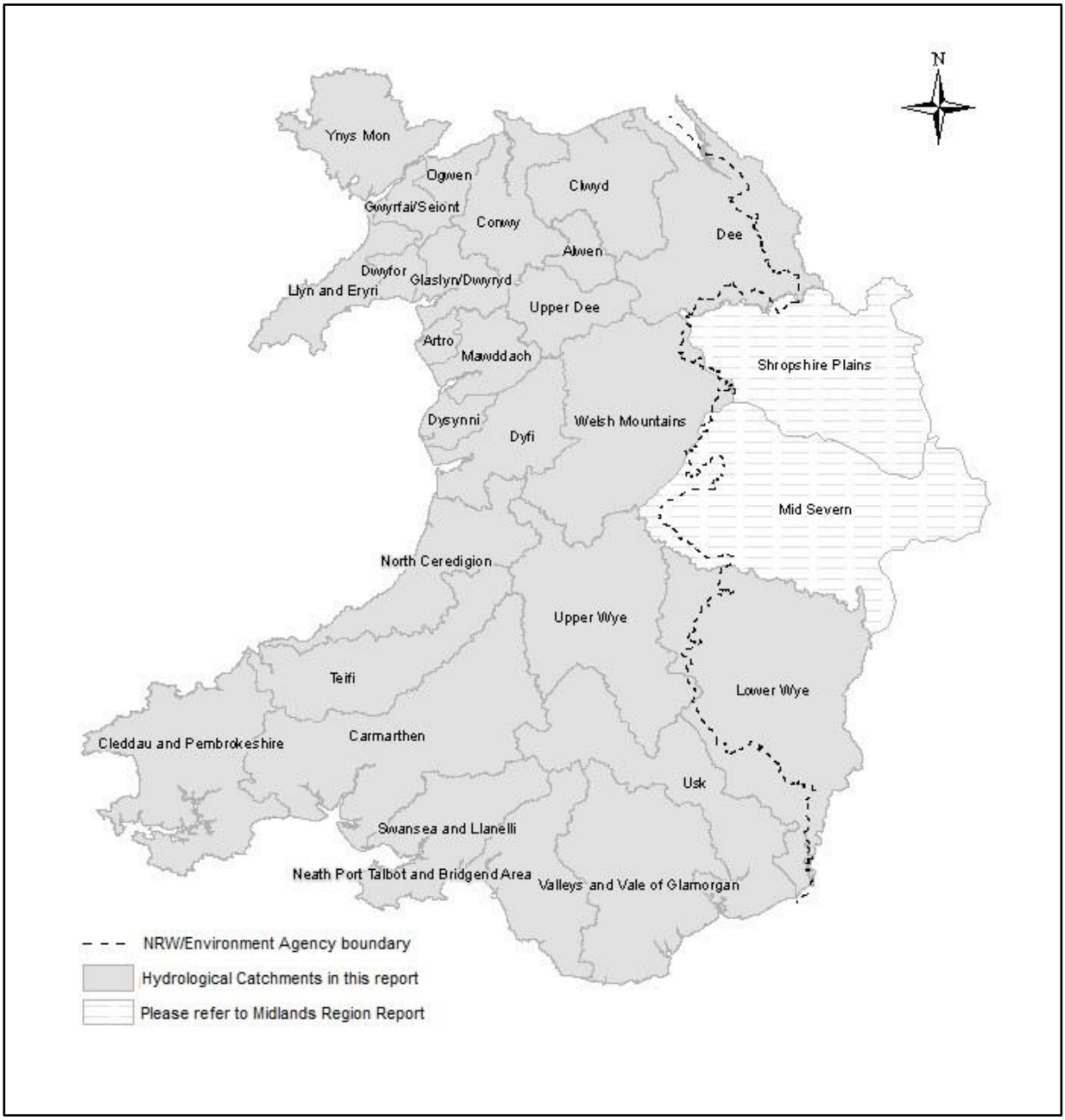


Figure 1: The Natural Resources Wales Water Situation Report features sites in the catchments shown. Parts of the Shropshire Plains and Mid Severn catchments are within Wales. For full information on these catchments, please see the Environment Agency Midlands Water Situation Report.

For areas adjoining Natural Resources Wales, please see the reports for Environment Agency Midlands and North West England:

Environment Agency - Midlands, England Water Situation Report
Environment Agency - North West, England Water Situation Report

Return to Summary

Rainfall

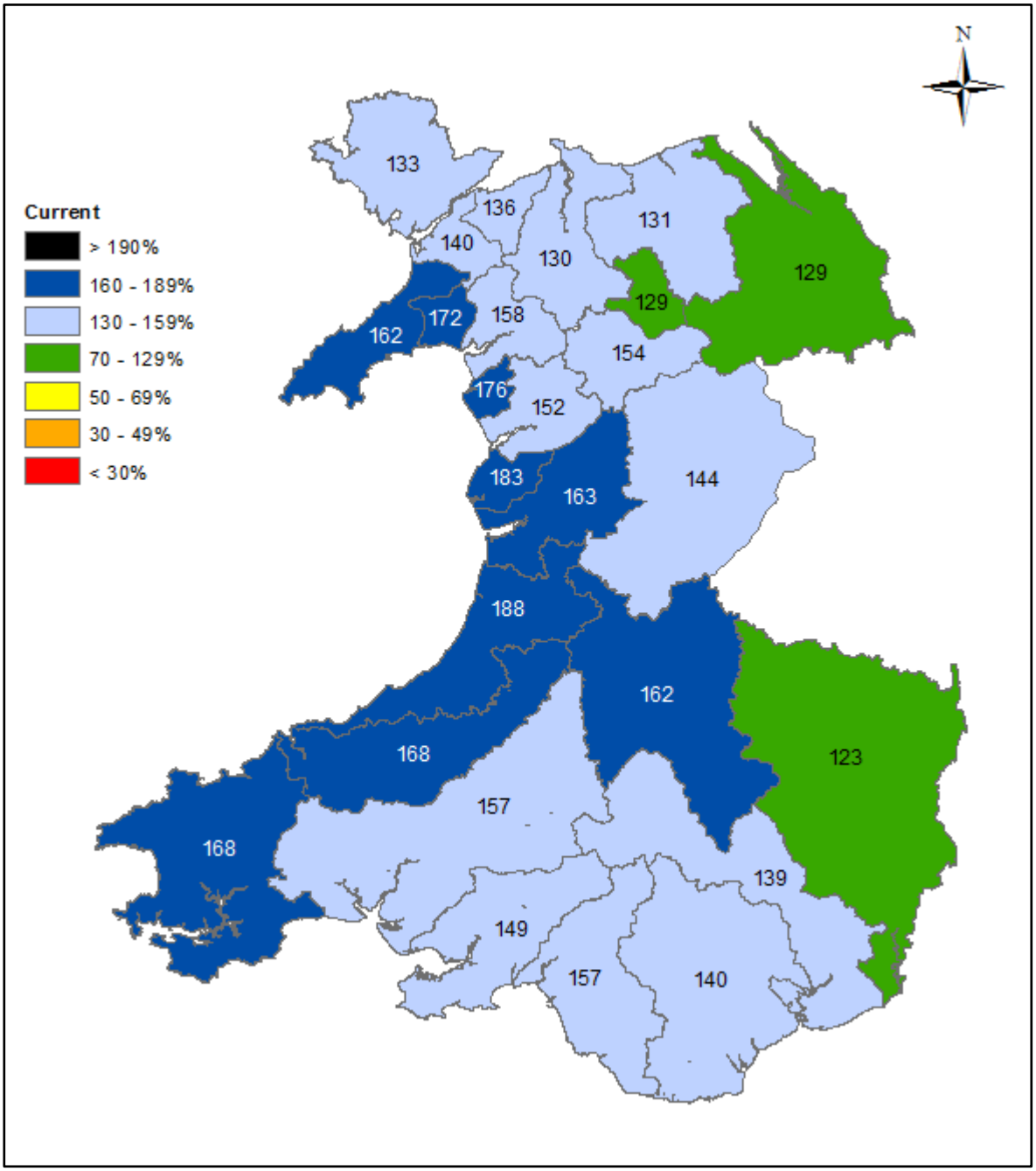
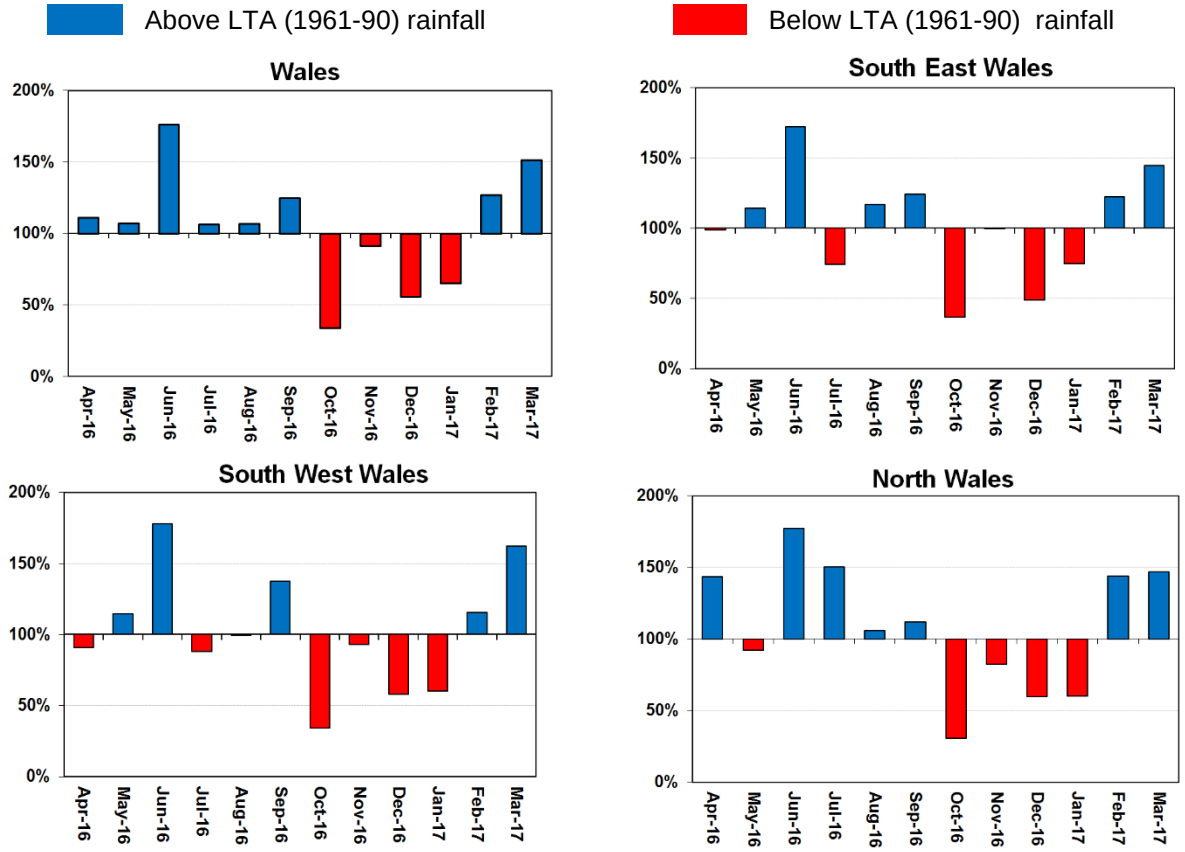


Figure 2: Calculated catchment average March rainfall totals as a percentage of the 1961-90 March long term average for Natural Resources Wales catchments, using NCIC (National Climate Information Centre) data (*Source: Met Office © Crown Copyright).*

Return to Summary

Rainfall Charts

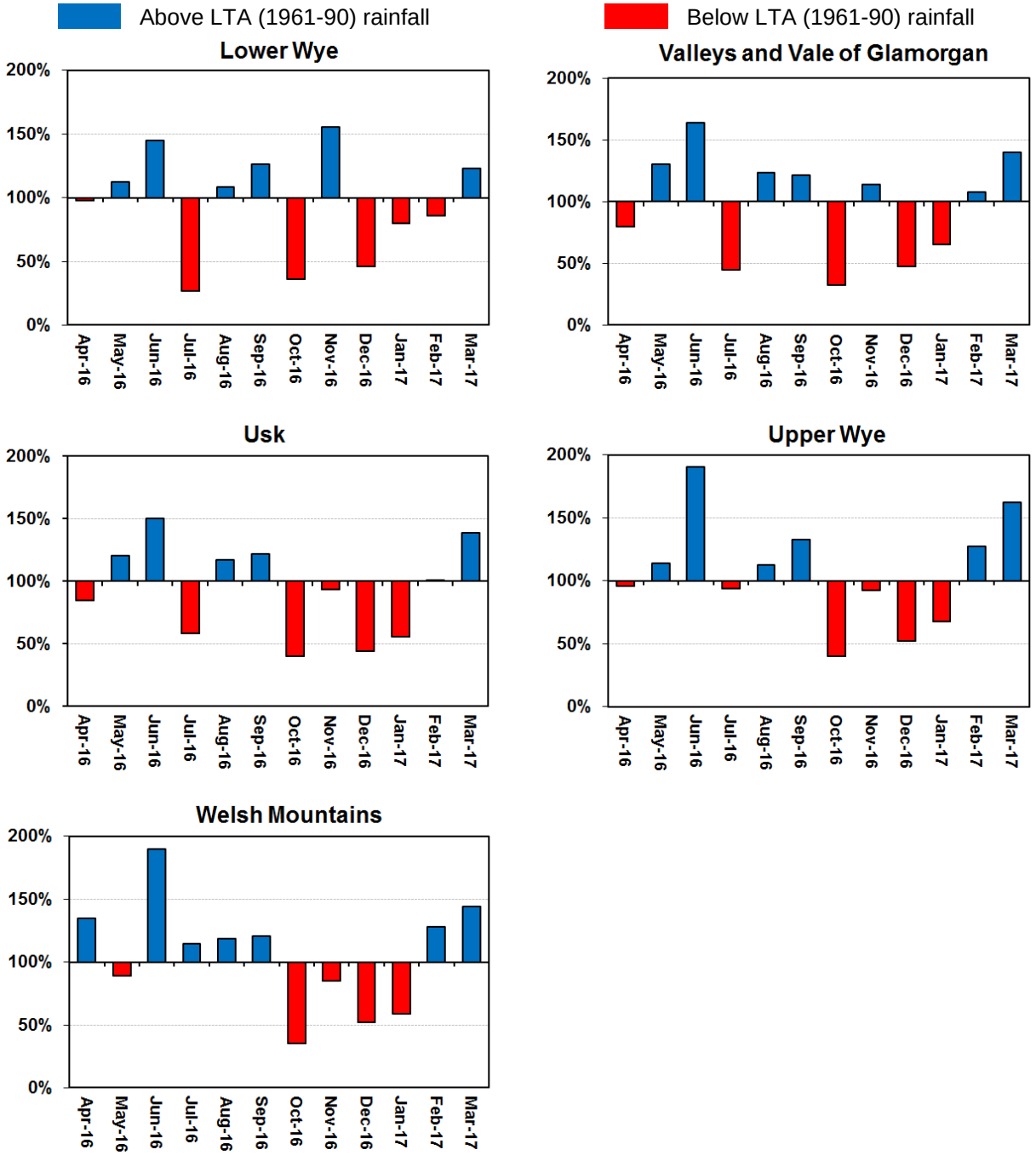
Figure 3: Rainfall Charts: National and Areas



Comparison of monthly rainfall totals to the 1961-90 long term average expressed as percentage for Natural Resources Wales and Areas, using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright).*

Return to Summary

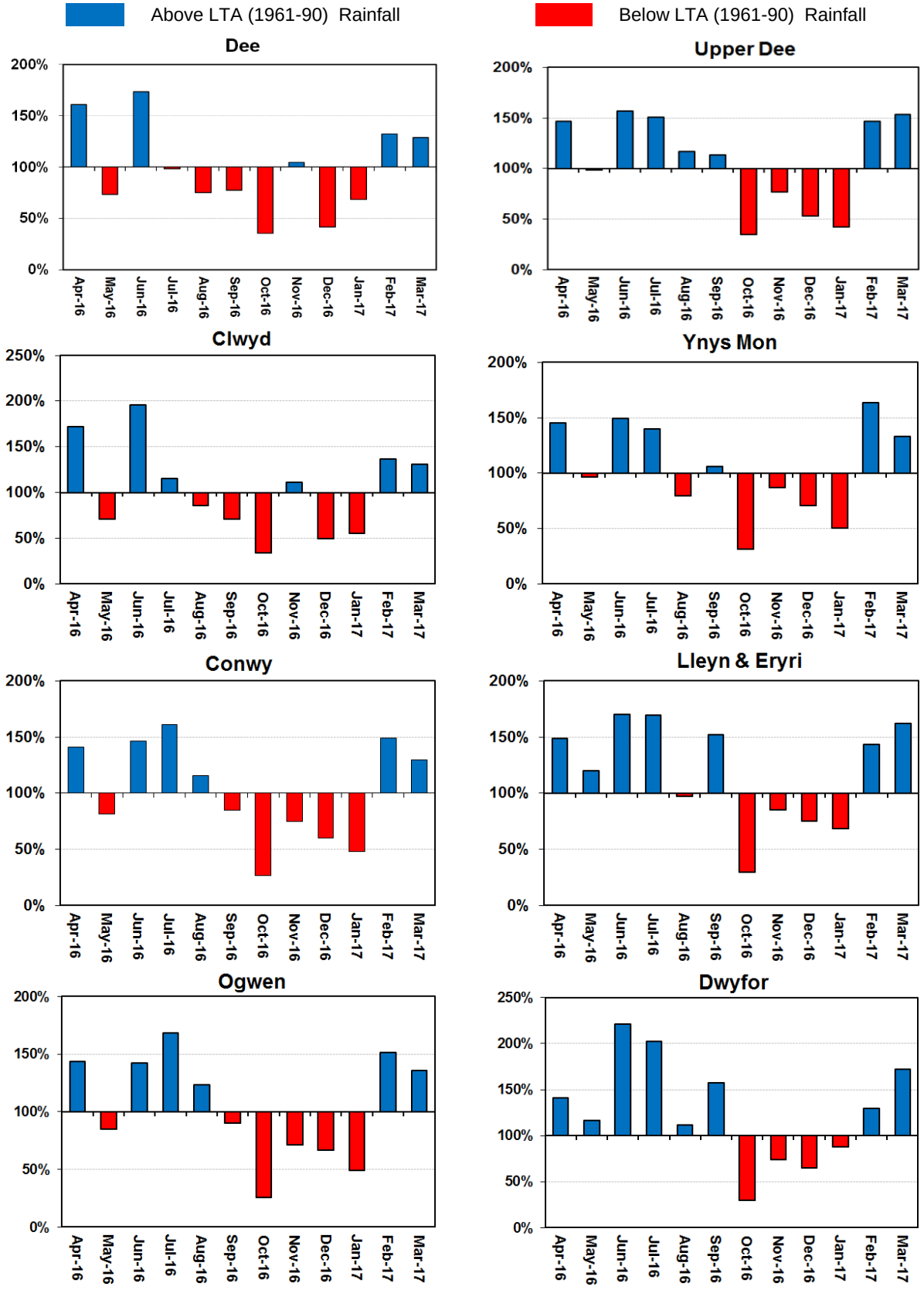
Figure 4: Rainfall Charts: South East Wales



Comparison of monthly rainfall totals to the 1961-90 long term average expressed as percentage for South East Wales, using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright).*

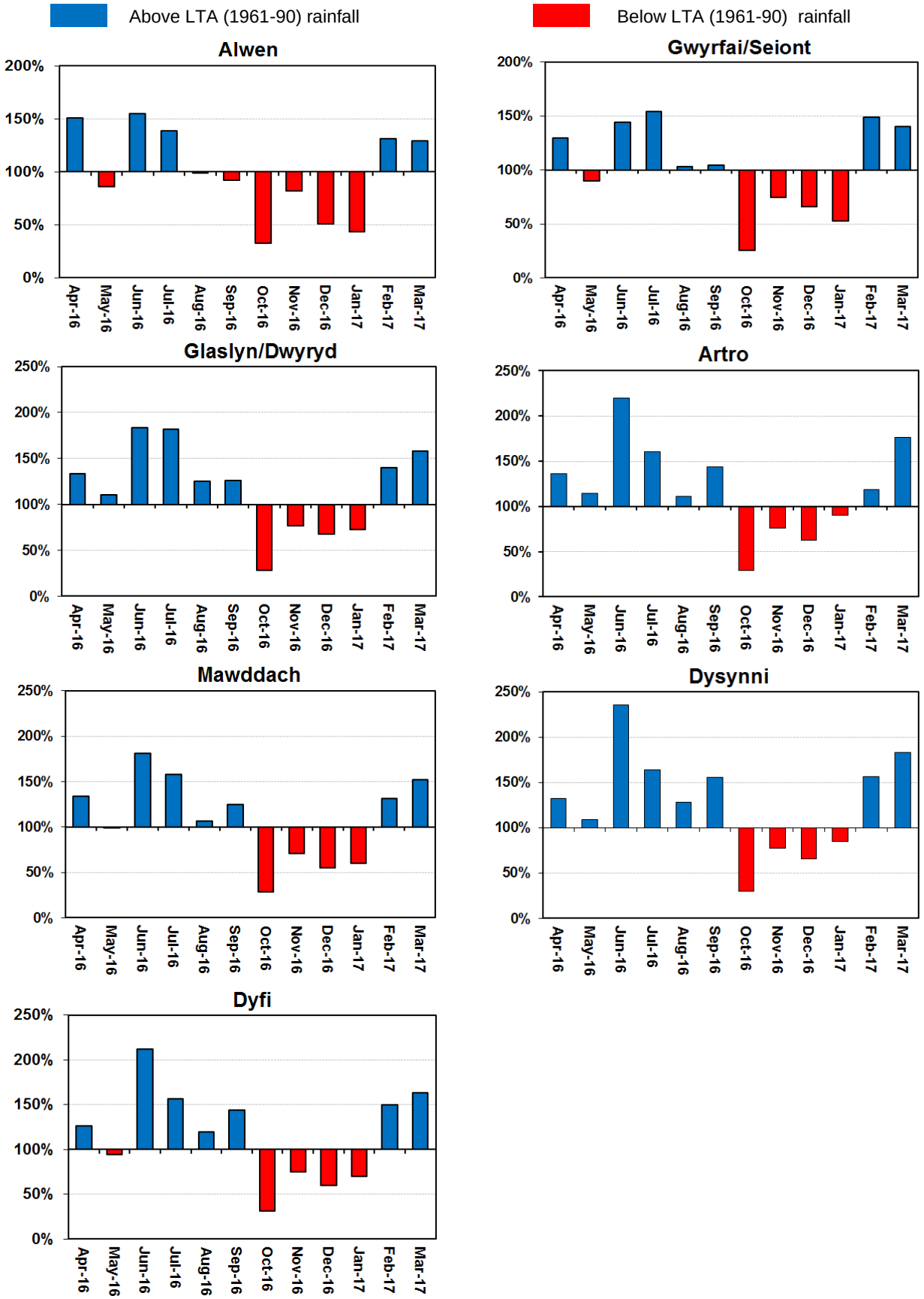
Return to Summary

Figure 5: Rainfall Charts: North Wales



Comparison of monthly rainfall totals to the 1961-90 long term average expressed as percentage for North Wales, using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright).*

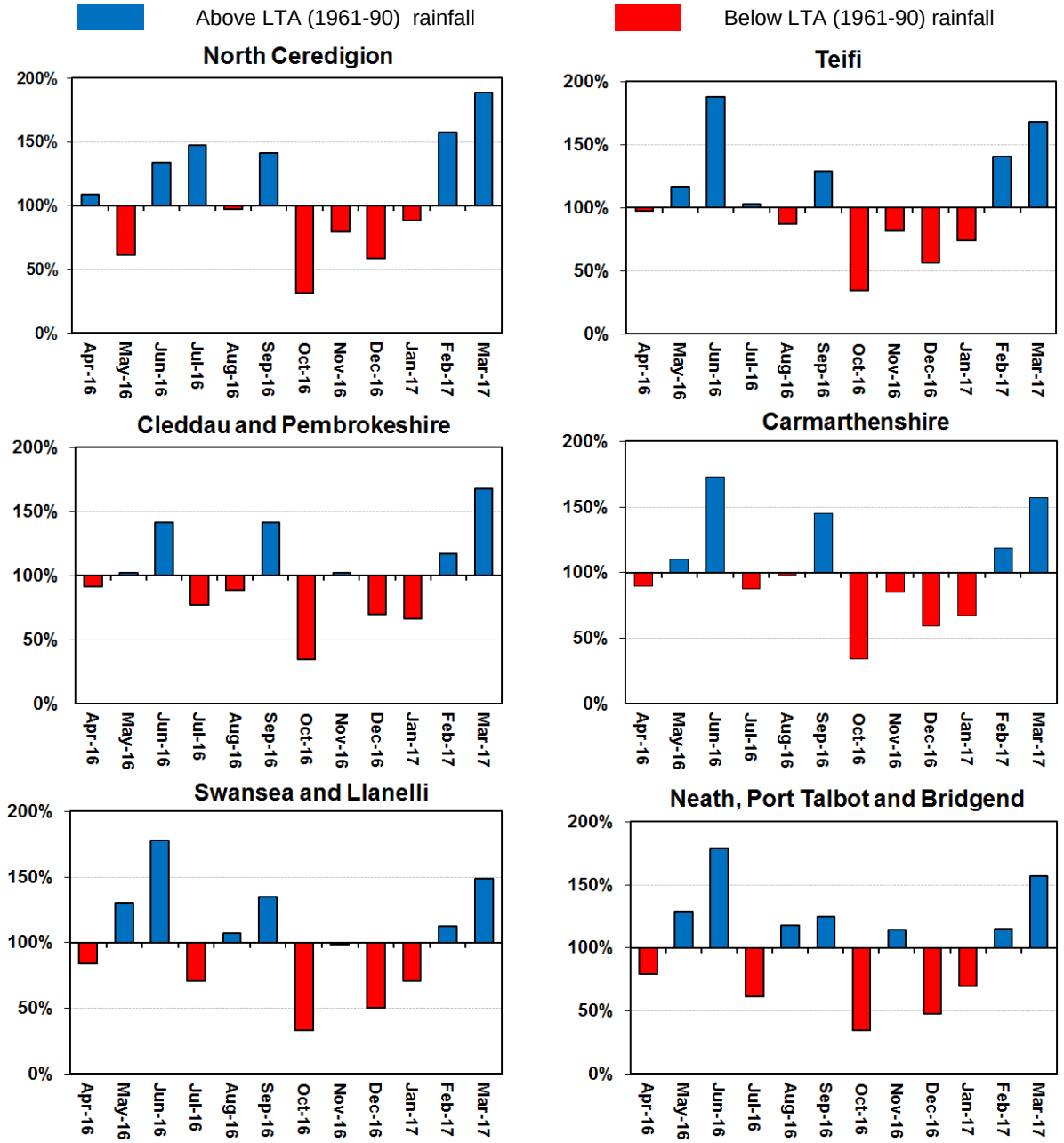
Return to Summary



Comparison of monthly rainfall totals to the 1961-90 long term average expressed as percentage for North Wales, using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright).*

Return to Summary

Figure 6: Rainfall Charts: South West Wales



Comparison of monthly rainfall totals to the 1961-90 long term average expressed as percentage for South West Wales, using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright).*

Return to Summary

Soil Moisture Deficit (SMD)

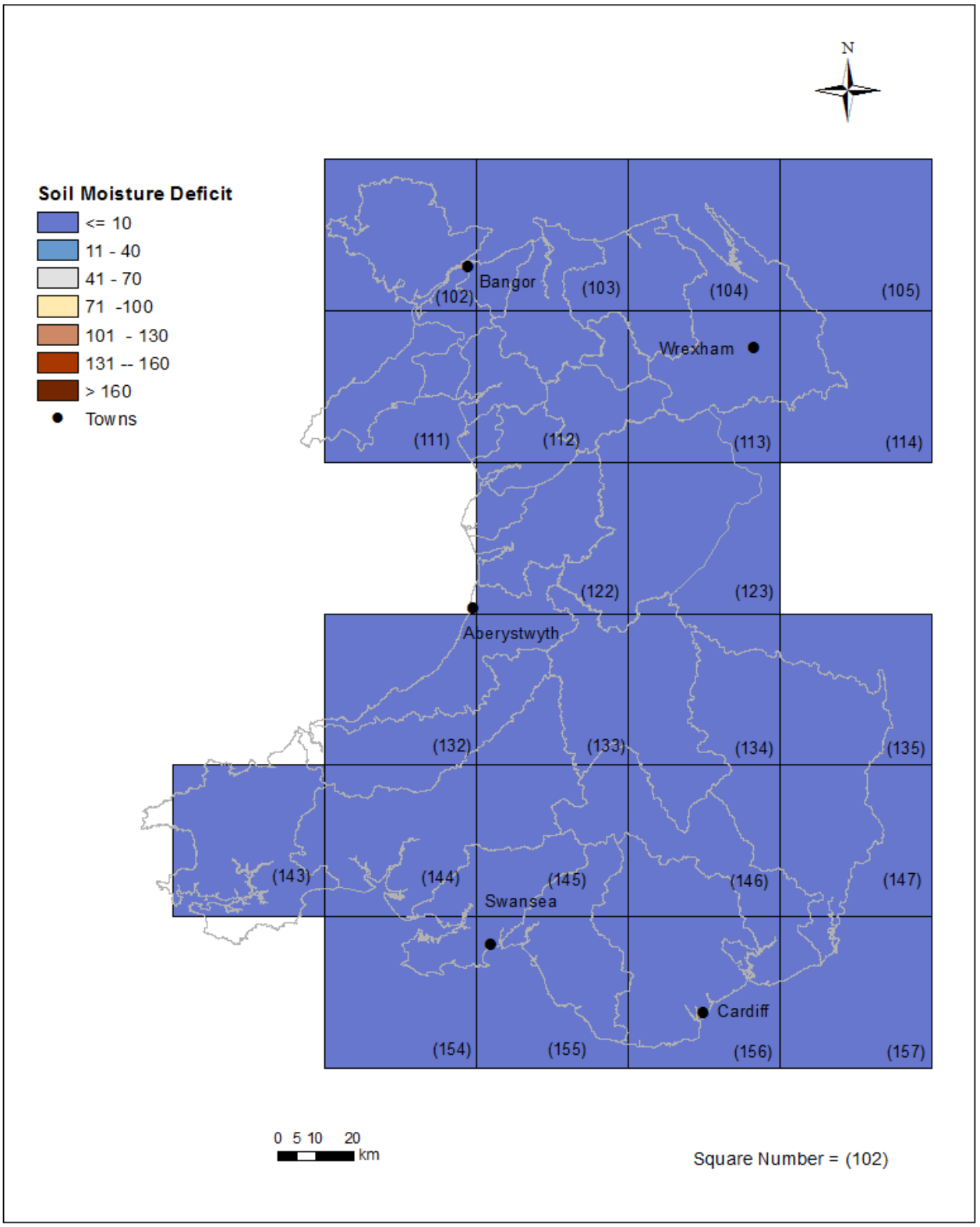


Figure 7: MORECS soil moisture deficits (mm) for March for real land use for Natural Resources Wales *(Source: Met Office © Crown Copyright).*

Return to Summary

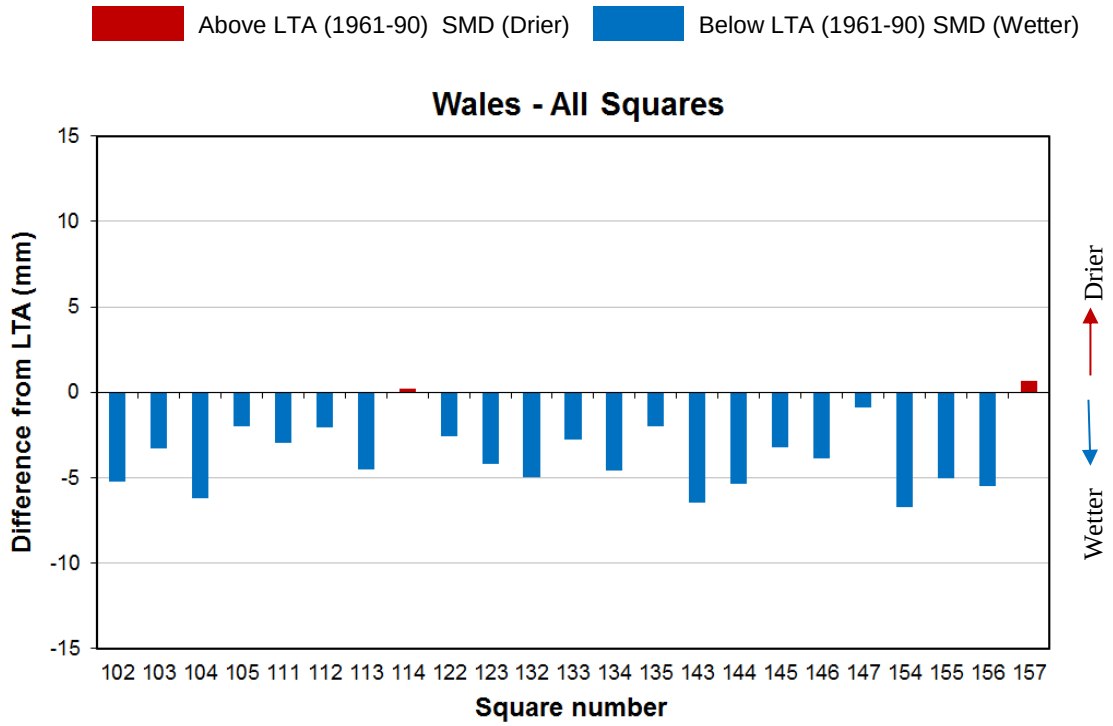


Figure 8: MORECS month end soil moisture deficits difference (mm) from the 1961-90 long term monthly average (LTA) for March for real land use for Natural Resources Wales squares (*Source: Met Office © Crown Copyright*).

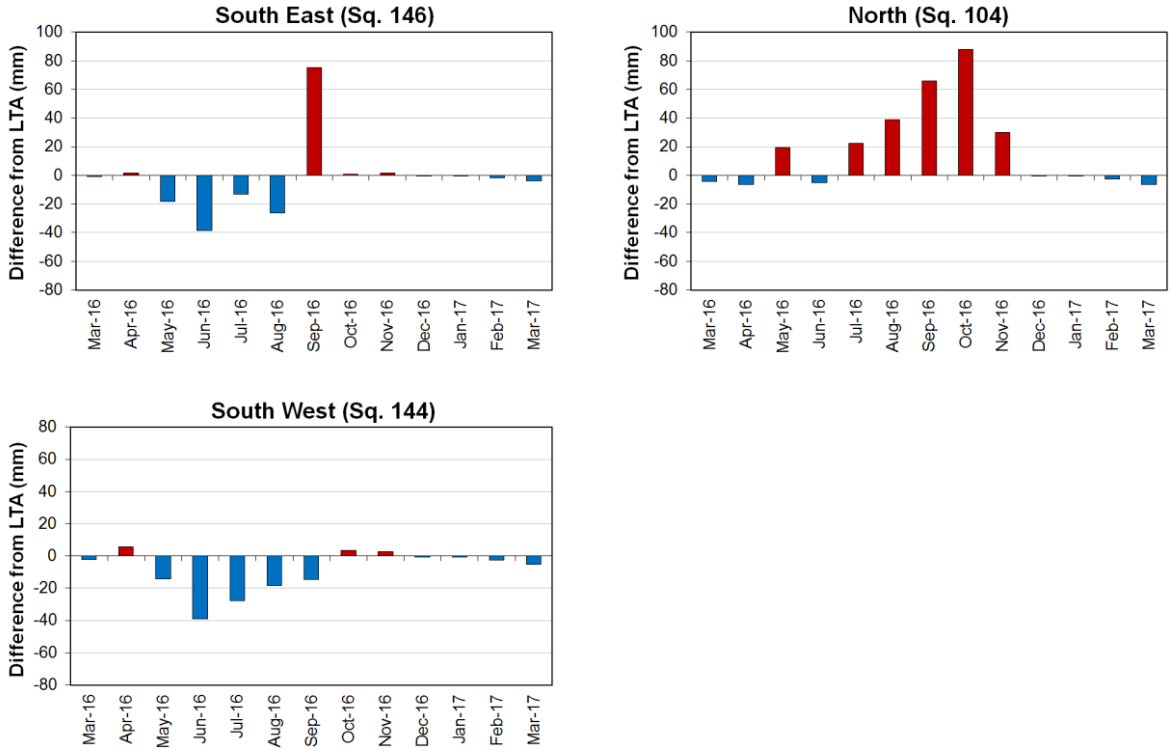


Figure 9: MORECS month end soil moisture deficit difference (mm) from the 1961-90 long term monthly average (LTA) for real land use for South East, North and South West (*Source: Met Office © Crown Copyright*). (Note: no LTA available for Natural Resources Wales.)

Return to Summary

River Flow

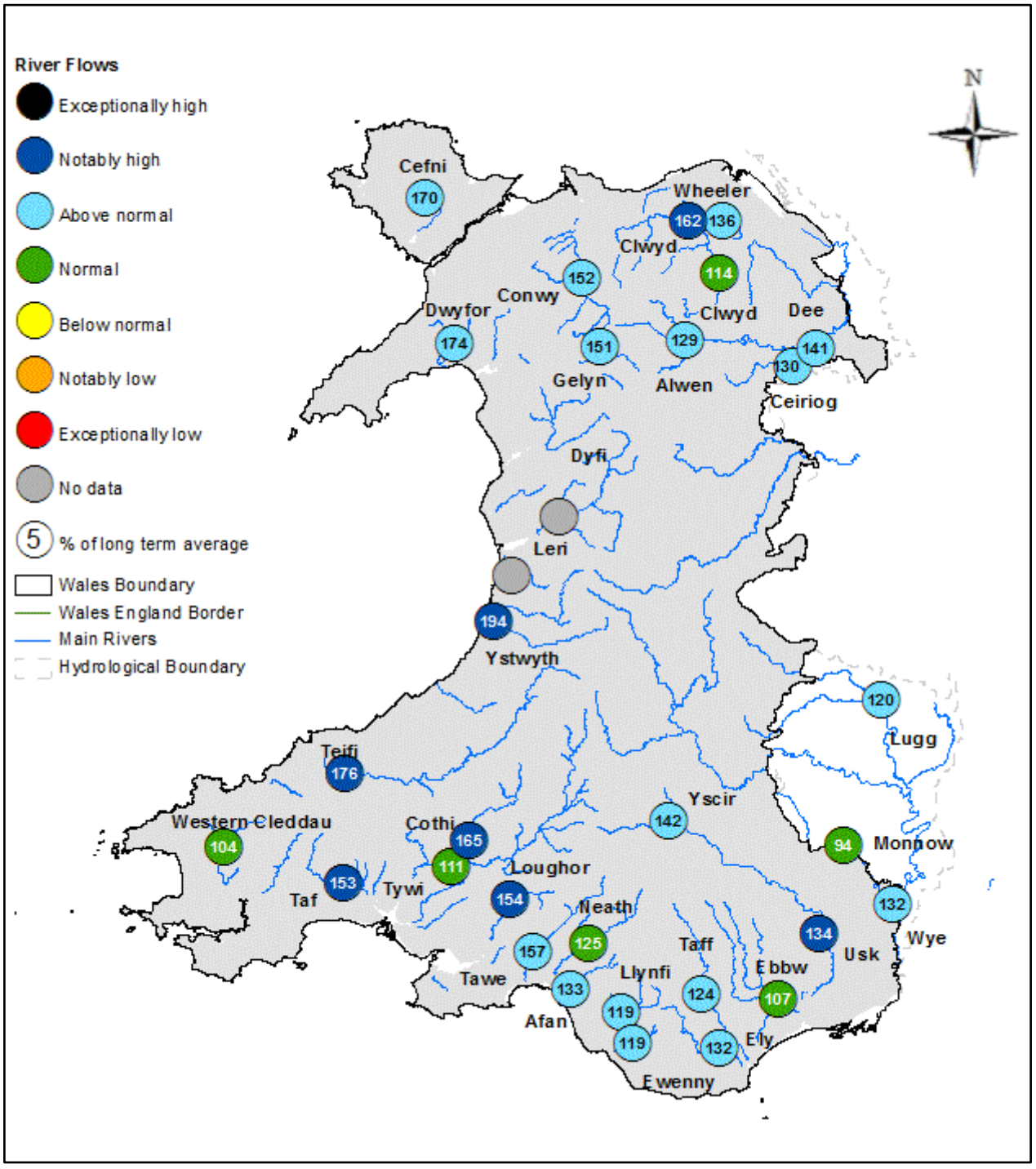


Figure 10: Monthly mean river flow for March, classed relative to analysis of historic March monthly means *(Source: Natural Resources Wales).*

Return to Summary

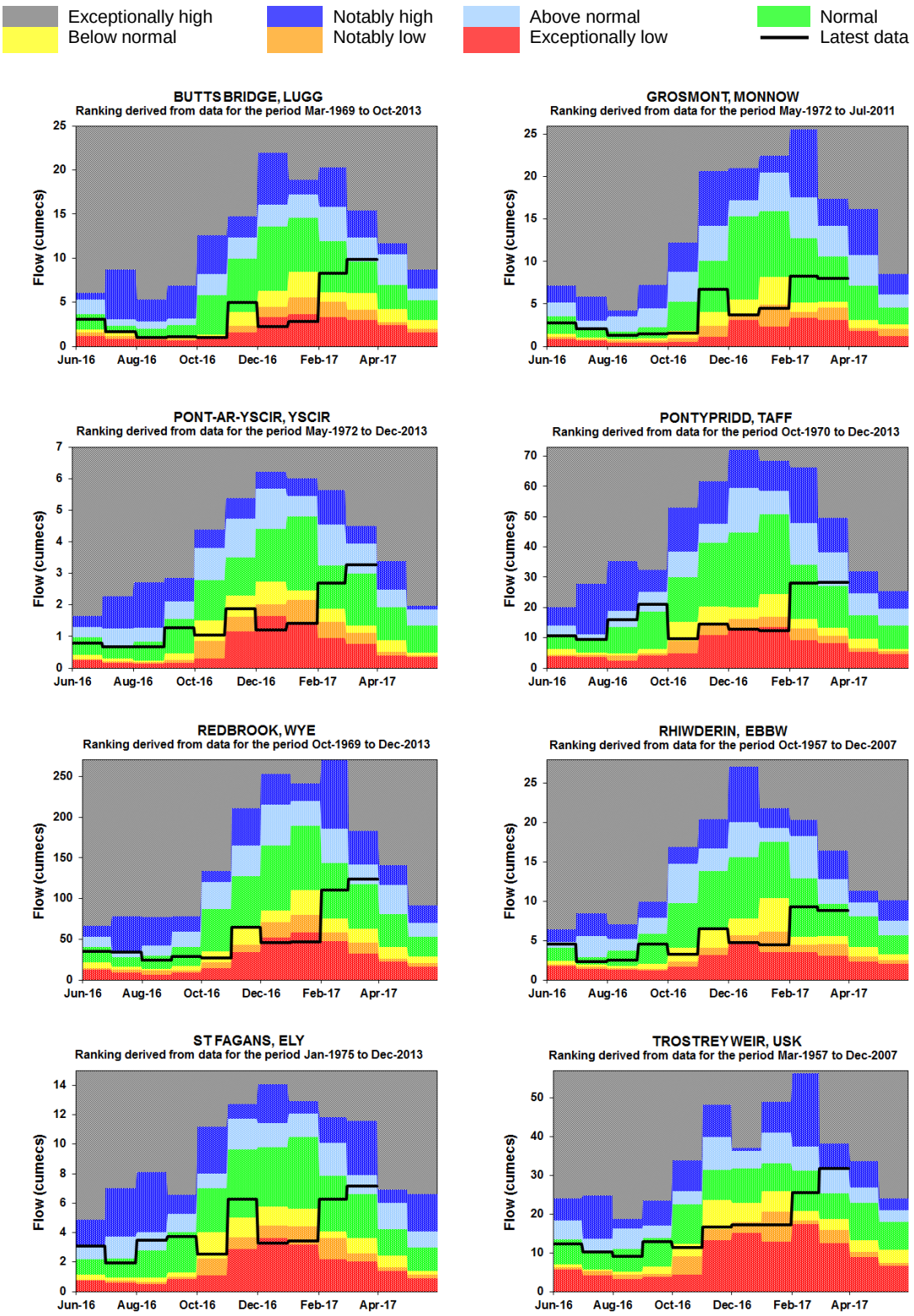
SITE NAME	RIVER	March 2017			March 2016		March LTA		
		Class	% of LTA	Flow (m3/s)	% of LTA	Flow (m3/s)	LTA	Monthly Min (m3/s)	Monthly Max (m3/s)
River Flow Sites : South East Area									
Butts Bridge	Lugg	Above normal	120%	9.84	80%	6.55	8.21	1.97	19.80
Grosmont	Monnow	Normal	94%	7.97	86%	7.27	8.49	1.66	22.50
Pont ar Yscir	Yscir	Above normal	142%	3.26	86%	1.97	2.30	0.38	6.30
Pontypridd	Taff	Above normal	124%	28.30	87%	19.77	22.74	4.87	72.70
Redbrook	Wye	Above normal	132%	124.00	90%	84.15	93.85	20.80	245.00
Rhiwderin	Ebbw	Normal	107%	8.85	81%	6.68	8.26	2.29	25.00
St Fagans	Ely	Above normal	132%	7.14	93%	5.02	5.41	1.37	13.60
Trostrey Weir	Usk	Notably high	134%	31.80	106%	25.27	23.73	8.23	66.70
River Flow Sites : North Area									
Bodfari	Wheeler	Above normal	136%	1.29	126%	1.20	0.95	0.47	1.76
Bodffordd	Cefni	Above normal	170%	0.73	128%	0.55	0.43	0.16	0.93
Brynkinalt Weir	Ceiriog	Above normal	130%	4.80	99%	3.65	3.70	0.73	9.04
Cwmlanerch	Conwy	Above normal	152%	30.10	100%	19.90	19.84	5.08	56.00
Cynefail	Gelyn	Above normal	151%	1.06	97%	0.68	0.70	0.20	1.63
Dol y Bont	Leri						1.69	0.48	3.90
Druid	Alwen	Above normal	129%	7.10	117%	6.46	5.52	1.64	15.30
Dyfi bridge	Dyfi				89%	24.30	27.25	5.65	75.80
Garndolbenmaen	Dwyfor	Above normal	174%	4.84	116%	3.23	2.78	0.83	6.96
Manley Hall	Dee	Above normal	141%	48.30	97%	33.50	34.37	10.50	83.60
Pont y Cambwll	Clwyd	Notably high	162%	11.80	141%	10.30	7.30	2.26	17.80
Ruthin Weir	Clwyd	Normal	114%	2.23	137%	2.68	1.96	0.41	4.00
River Flow Sites : South West Area									
Capel Dewi	Tywi	Normal	111%	48.90	87%	38.47	44.18	11.00	138.00
Clog y Fran	Taf	Notably high	153%	12.50	99%	8.12	8.18	2.88	26.60
Coytrahen	Llynfi	Above normal	119%	2.94	92%	2.27	2.47	0.67	7.64
Felin Mynachdy	Cothi	Notably high	165%	20.00	100%	12.19	12.15	2.82	40.70
Glanteifi	Teifi	Notably high	176%	53.60	122%	37.15	30.47	8.28	96.70
Keepers Lodge	Ewenny	Above normal	119%	2.58	91%	1.96	2.16	0.80	6.00
Marcroft	Afan	Above normal	133%	7.48	88%	4.91	5.61	1.31	16.50
Pont Llolwyn	Ystwyth	Notably high	194%	12.00	114%	7.01	6.17	1.72	18.50
Treffgarne *	Western Cleddau	Normal	104%	4.49	90%	3.87	4.32	1.66	11.89
Resolven	Neath	Normal	125%	13.60	87%	9.47	10.91	1.89	33.00
Tir-y-Dail	Loughor	Notably high	154%	3.46	116%	2.60	2.25	0.74	5.23
Ynystanglws	Tawe	Above normal	157%	18.90	110%	13.17	12.01	3.18	41.60

Figure 11: Monthly mean river flow for March with comparison against previous year expressed as a percentage of the March long term average and classed relative to analysis of historic March monthly means. *(Source: Natural Resources Wales).* (* For Treffgarne station the LTAs were derived using scaled historical flows (1965-2003) from the downstream station at Prendergast Mill.)

Return to Summary

River Flow Charts

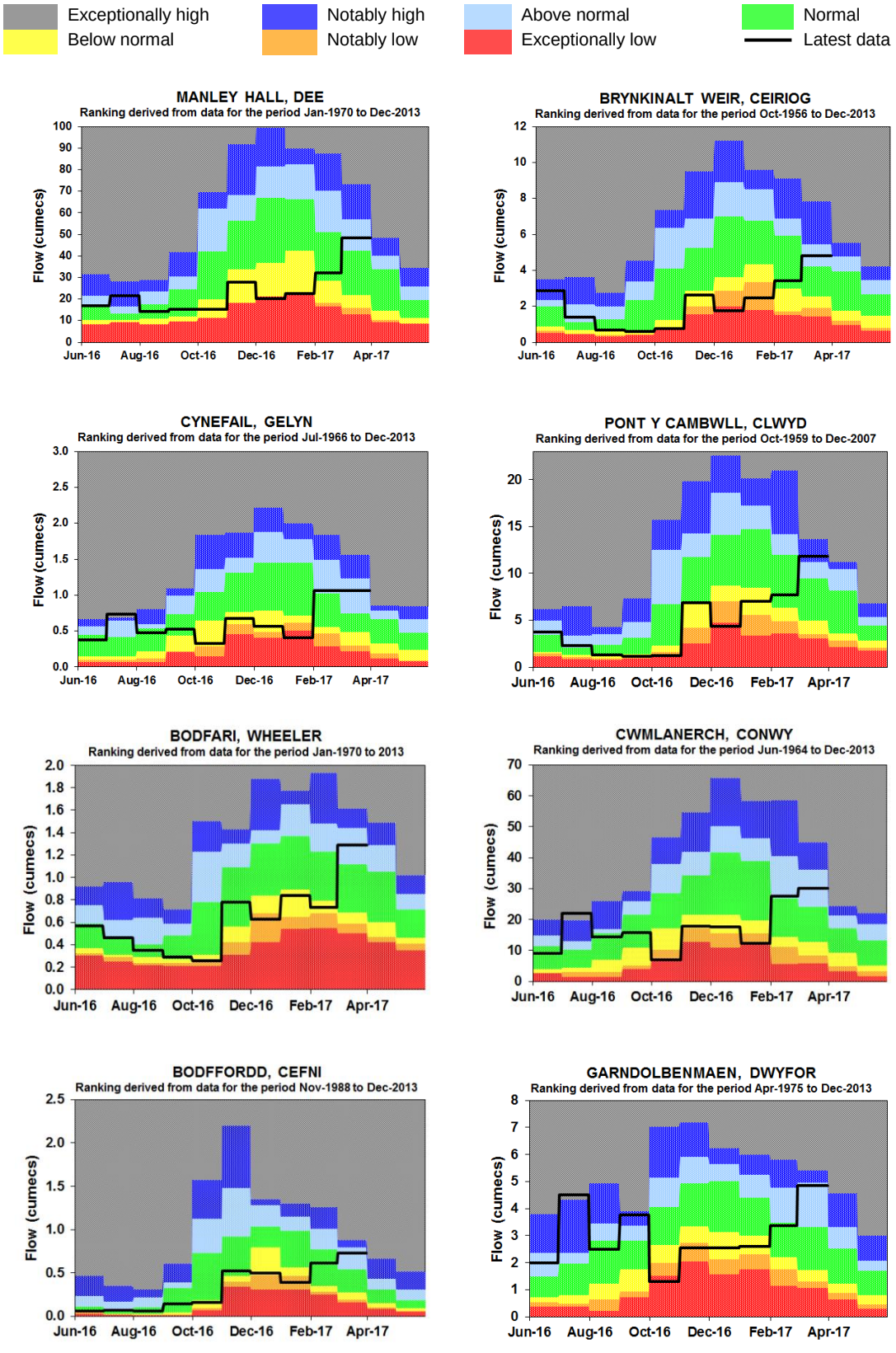
Figure 12: River Flow Charts: South East Wales



Monthly mean river flows for the last 10 months classed relative to the analysis of historic river levels (*Source: Natural Resources Wales*).

Return to Summary

Figure 13: River Flow Charts: North Wales



Monthly mean river flows for the last 10 months classed relative to the analysis of historic river levels (*Source: Natural Resources Wales*).

Return to Summary

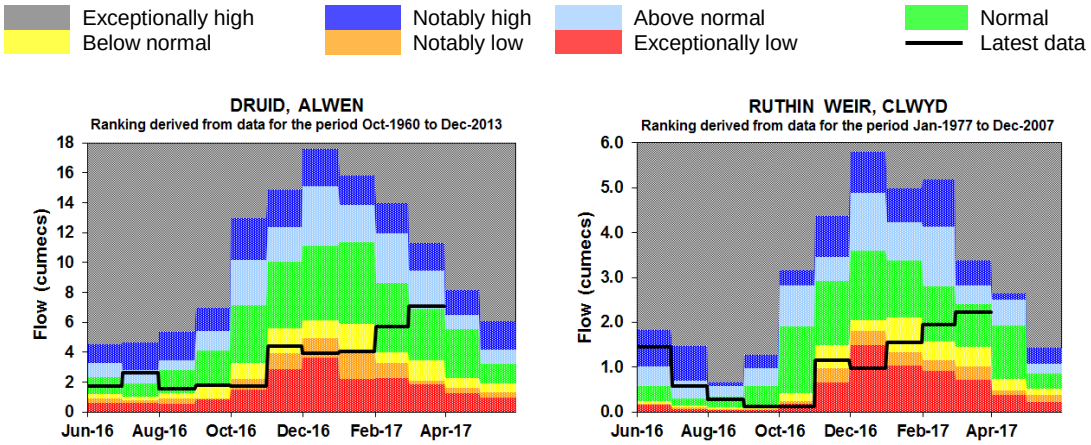
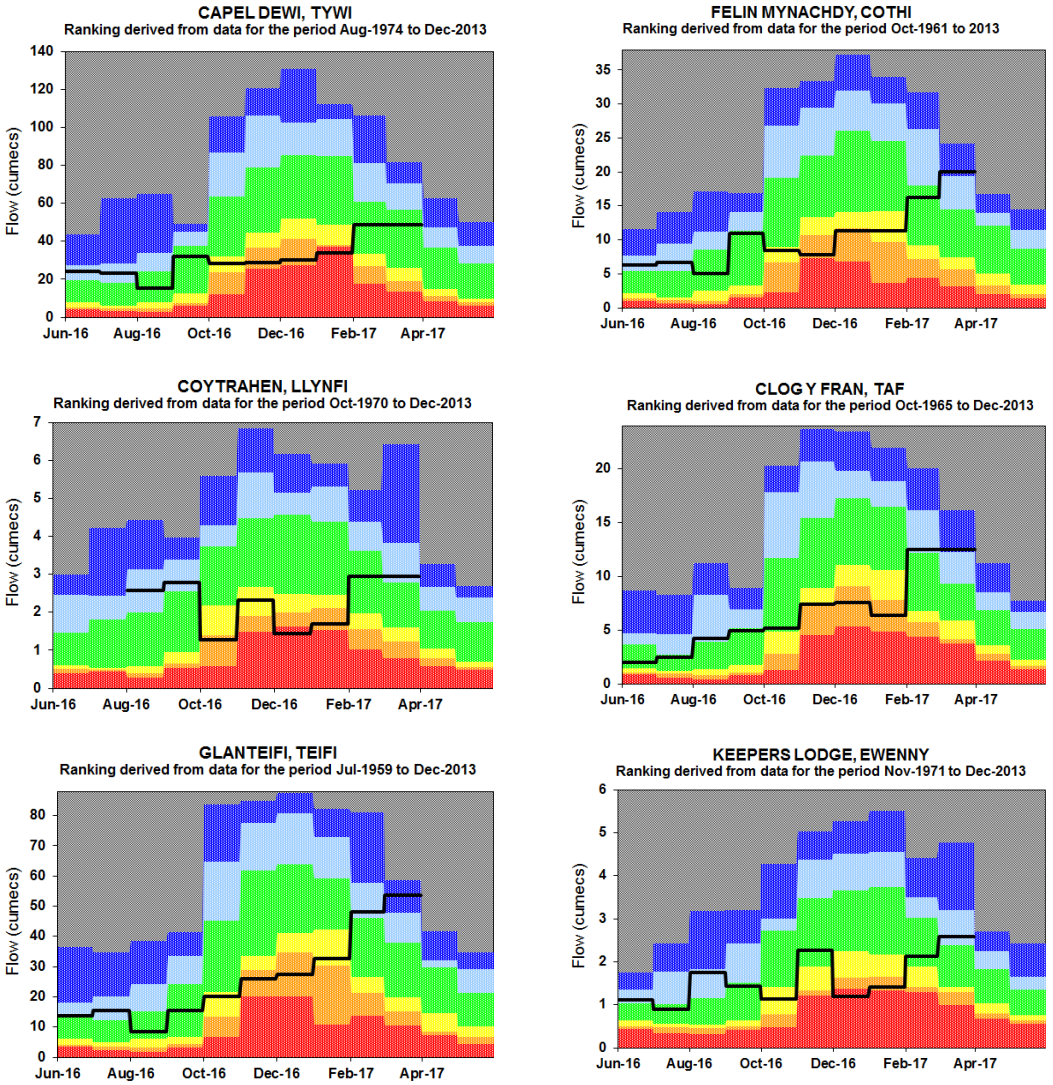
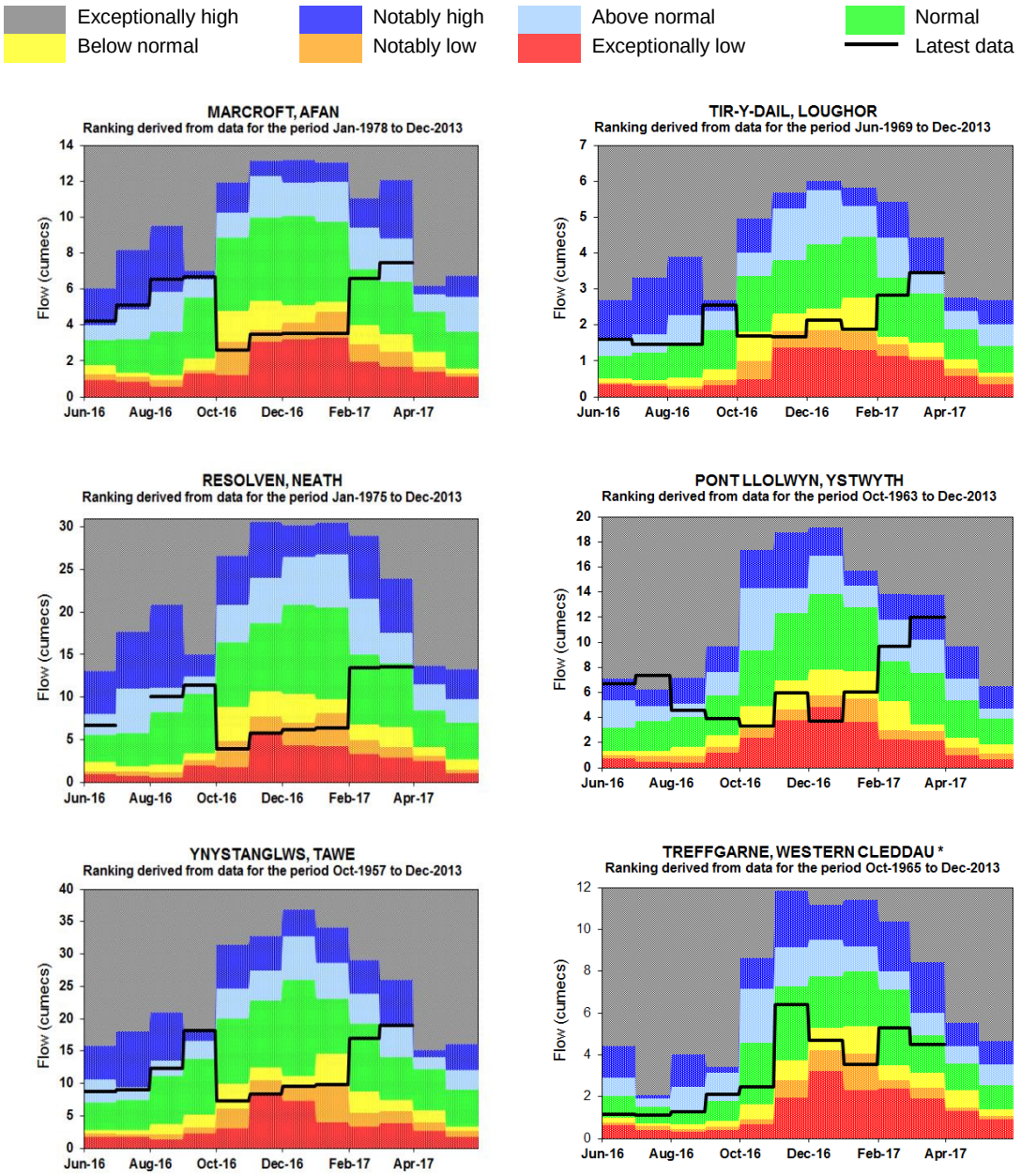


Figure 14: River Flow Charts: South West Wales



(Please note that there was no data for Coytrahen for June and July 2016 due to the river works)

Return to Summary



Monthly mean river flows for the last 10 months classed relative to the analysis of historic river levels. *(Source: Natural Resources Wales).*

(* Please note that for Treffgarne station the ranking bands were derived using scaled historical flows (1965-2003) from the downstream station at Prendergast Mill. There were no data for Resolven for July 2016 due to river works)

Return to Summary

Groundwater Levels

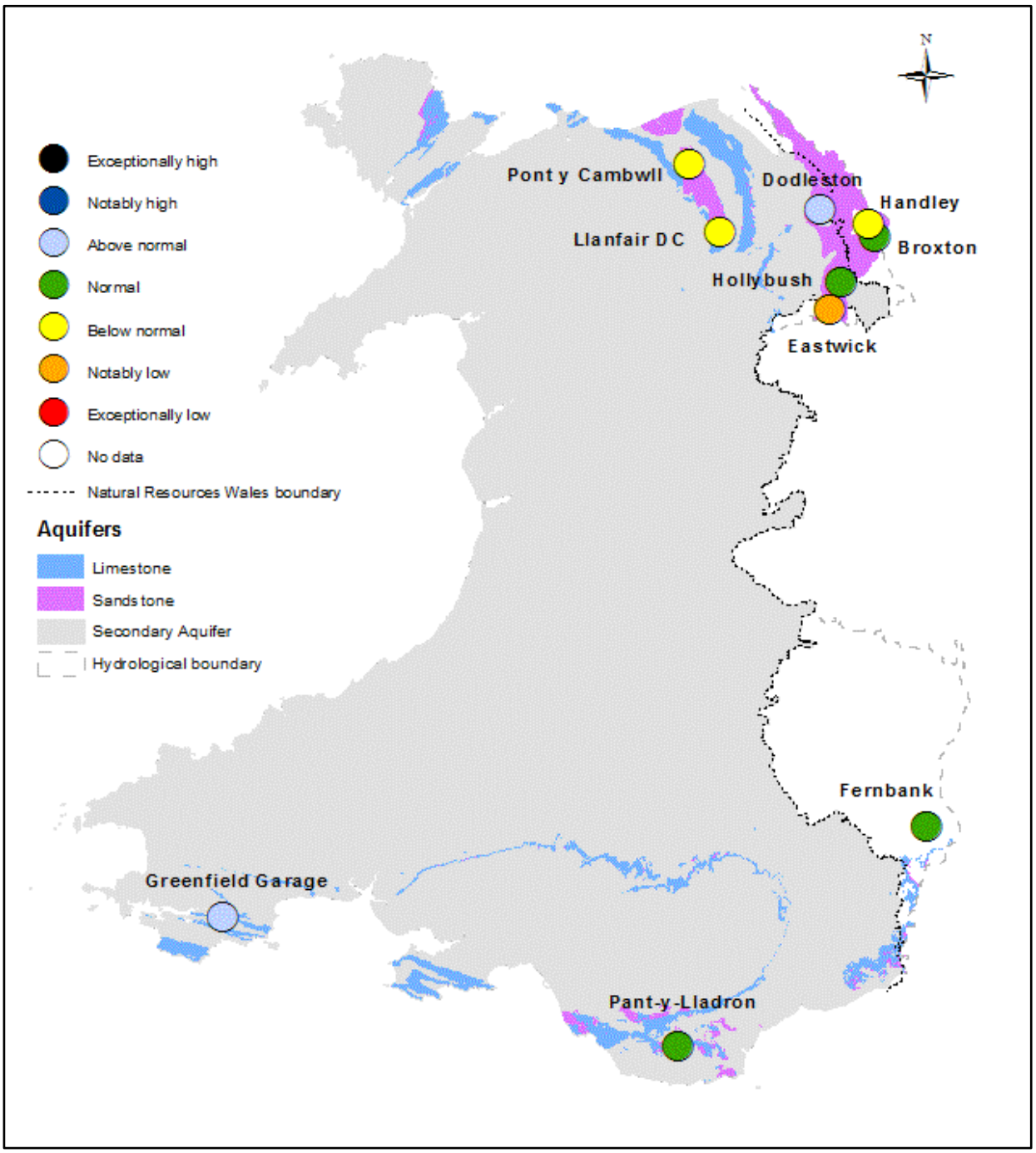
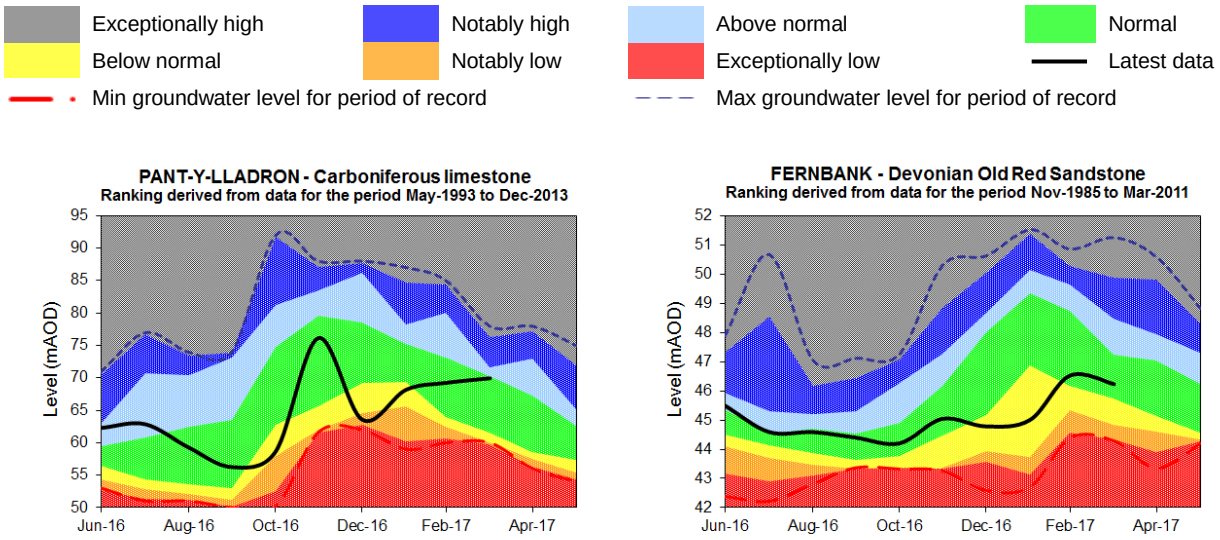


Figure 15: Groundwater levels at the end of month classed relative to an analysis of historic March groundwater levels *(Source: Natural Resources Wales and Environment Agency).*

Return to Summary

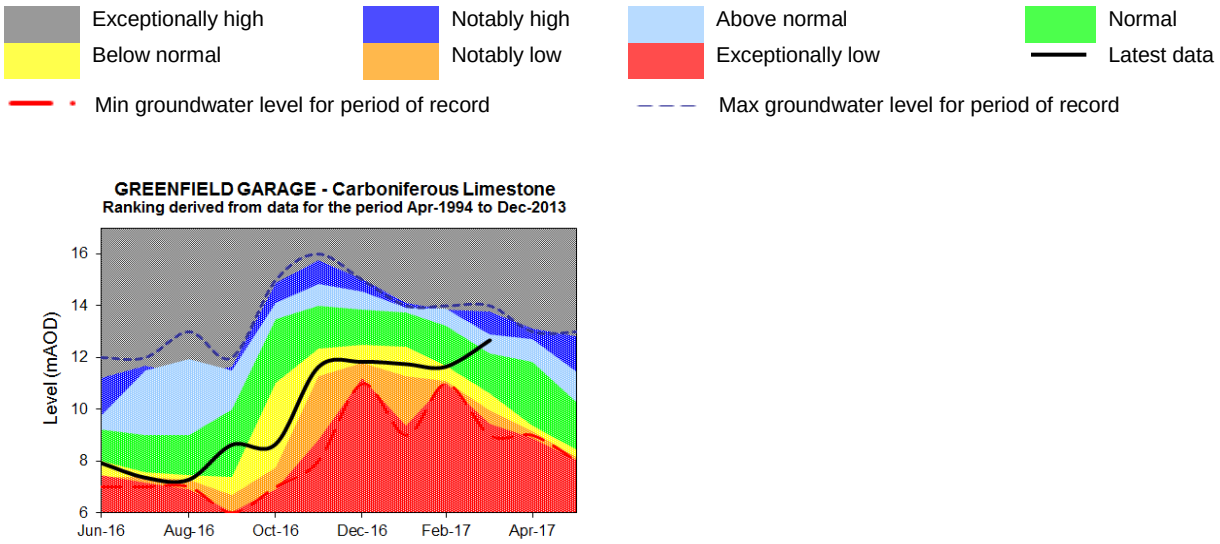
Groundwater charts

Figure 16: Groundwater level charts: South East Wales



End of month groundwater levels for the past 10 months for index sites *(Source: Natural Resources Wales).*

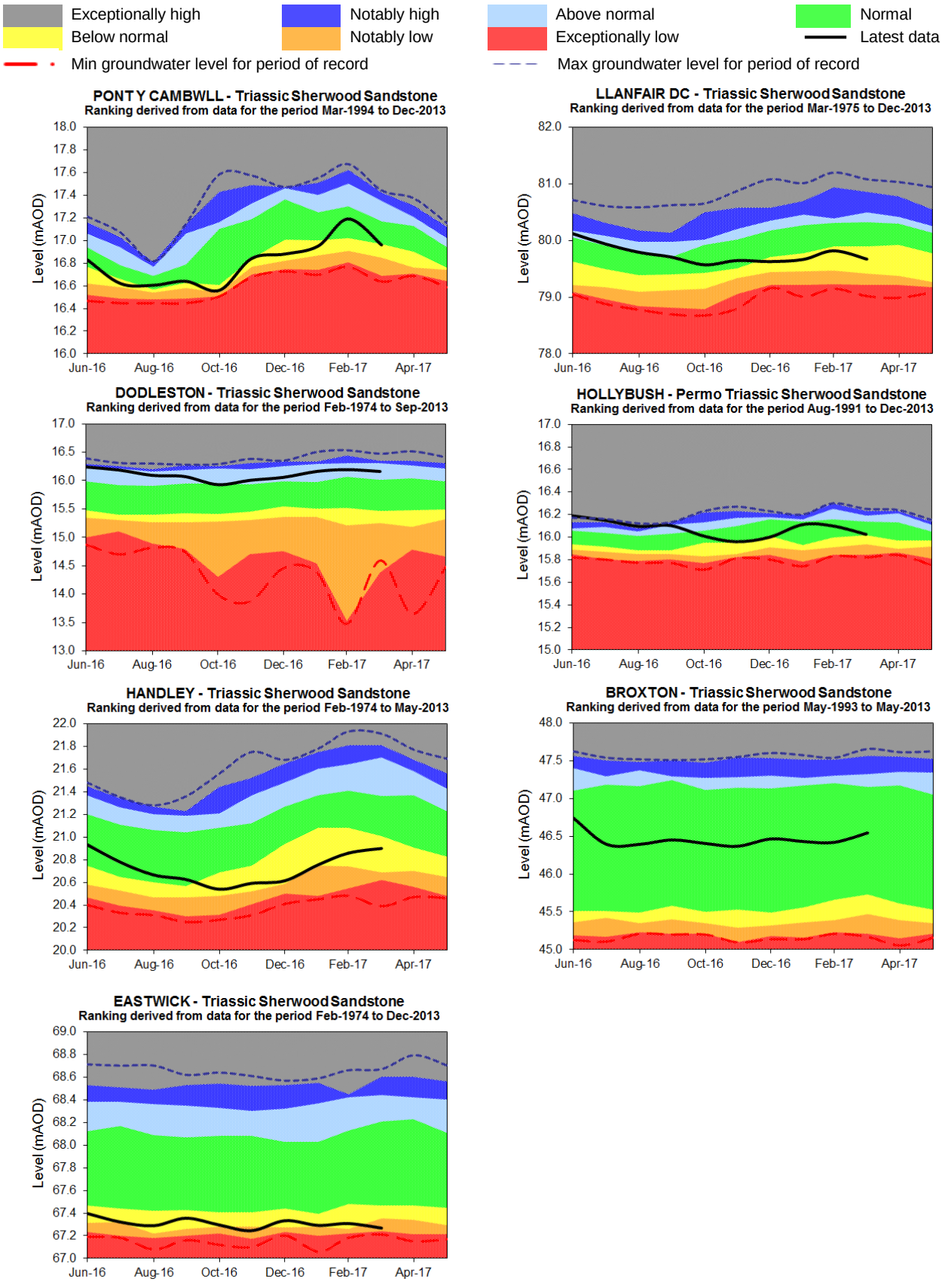
Figure 17: Groundwater level charts: South West Wales



End of month groundwater levels for the past 10 months for index sites *(Source: Natural Resources Wales).*

Return to Summary

Figure 18: Groundwater level charts: North Wales

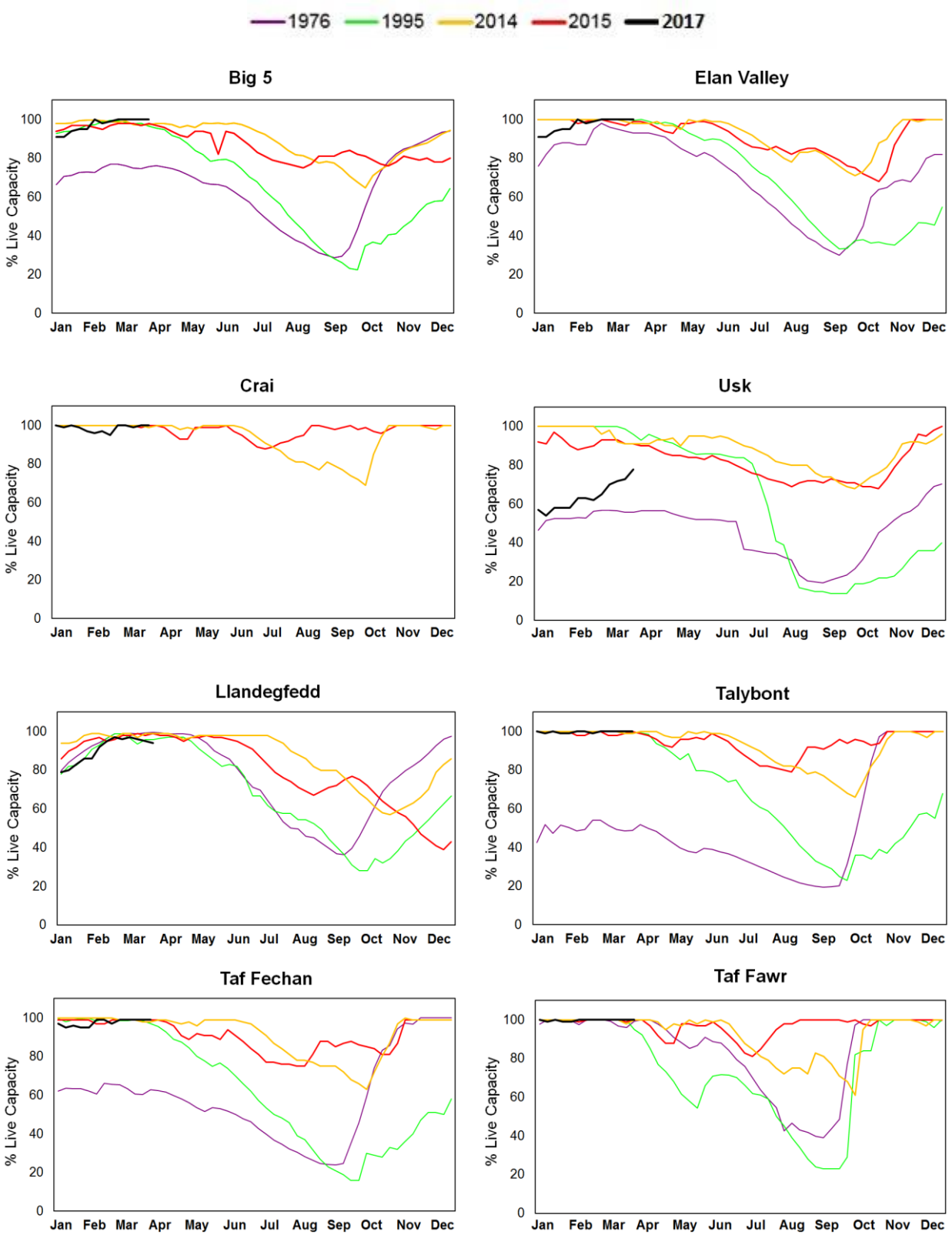


End of month groundwater levels for the past 10 months for index sites *(Source: Natural Resources Wales and Environment Agency)*.

Return to Summary

Reservoir Storage

Figure 19: Reservoir charts: South East Wales

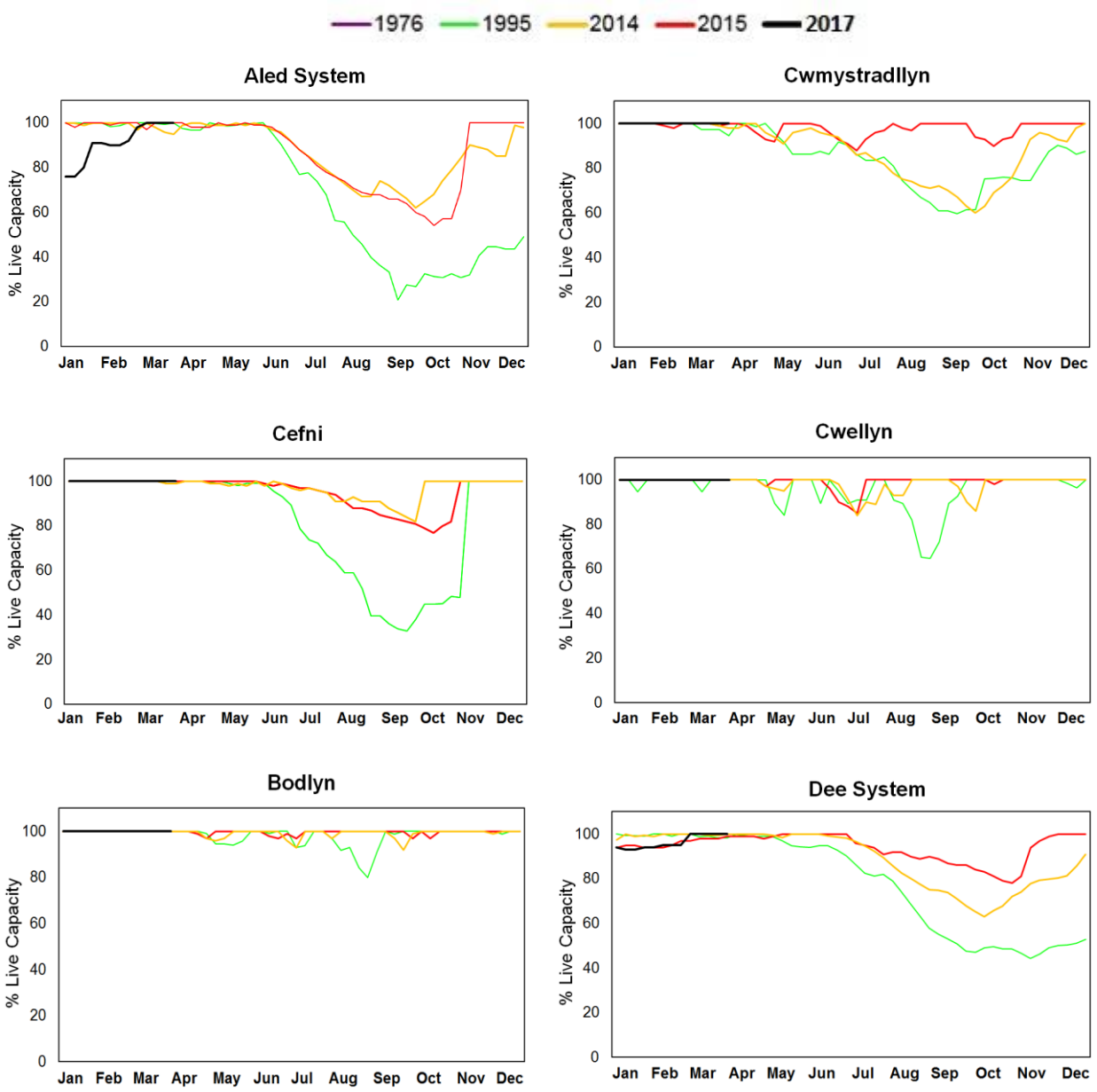


Weekly reservoir stocks for Natural Resources Wales index sites *(Source: Welsh Water)*

(Please note that the reservoir Usk stock (65%) were low at the end of February due to maintainance work being carried out on this reservoir although its stock has increased compared with the previous months.

Return to Summary

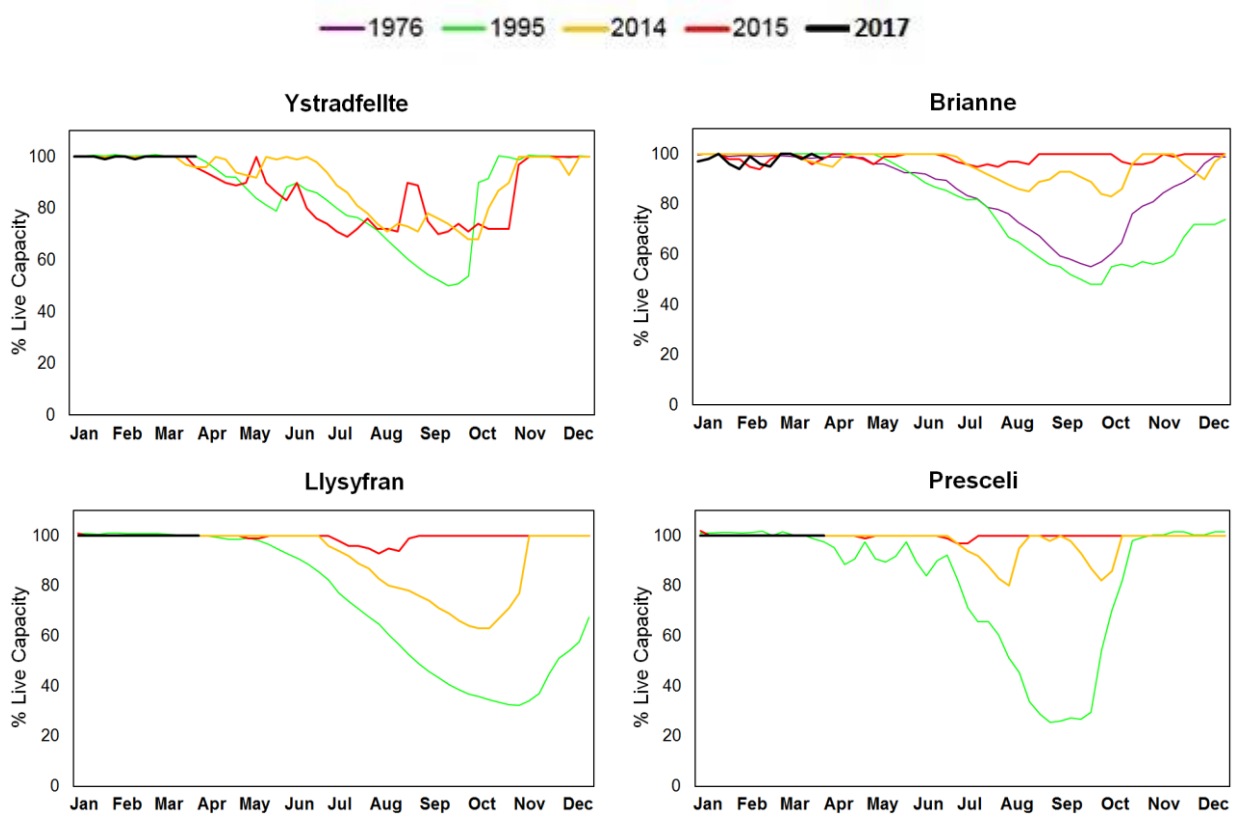
Figure 20: Reservoirs charts: North Wales



Weekly reservoir stocks for Natural Resources Wales index sites *(Source: Welsh Water).*

Return to Summary

Figure 21: Reservoirs charts: South West Wales



Weekly reservoir stocks for Natural Resources Wales index sites (*Source: Welsh Water*).

Return to Summary

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).
Effective rainfall	The rainfall available to percolate into the soil or produce river flow. Expressed in depth of water (mm).
Groundwater	The water found in an aquifer
Meteorological Office Rainfall and Evaporation Calculating System (MORECS)	The Met Office provides climate data for grid squares measuring 40km by 40km across the UK using MORECS
Recharge	The process of increasing the water stored in the saturated zone of an aquifer. Expressed in depth of water (mm).
Reservoir live capacity	The reservoir capacity normally usable for storage to meet established reservoir operating requirements. It is the total capacity less that not available because of operating agreements or physical restrictions. Only under abnormal conditions, such as a severe water shortage might this additional water be extracted.
Soil moisture deficit (SMD)	The difference between the amount of water actually in the soil and the amount of water that 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

Units

cumecs	Cubic metres per second ($m^3 s^{-1}$)
mAOD	Metres Above Ordnance Datum (mean sea level at Newlyn Cornwall).