Monthly Water Situation Report June 2019

Natural Resources Wales

- **The monthly rainfall total for Wales during June was 201% of the Long Term Average (LTA, 1961-90). South East, South West and North Wales received 211%, 194% and 198% of the LTA, respectively. June 2019 was the 4th wettest month of June since records started in 1910.**
- **At the end of June, the differences between soil moisture deficit (SMD) values and the LTA across Wales were from -51.8 to -1.5 mm. Soil were wetter than the LTA for all the squares in June.**
- **For river flows in Wales, 8 out of 29[1] indicator sites were classed as *Normal* and 8 sites were *Above normal*. 6 sites were *Notably high* and the remaining 7 sites were *Exceptionally high*.**
- **The cumulative reservoir storage for 15 out of 18 indicator reservoirs was greater than 90% at the end of June. All reservoirs were within normal operating ranges for the time of year.**

Rainfall*

The monthly rainfall total for Wales was 201% of the LTA for June. The percentage of rainfall recorded in catchments compared with their LTA across Wales was between 131% (Gwyrfai/Seiont and Ynys Mon) and 278% (Dee). The rainfall total for Wales was 80.0mm more than the June LTA. For South East, South West and North Wales the rainfall totals were 211%, 194% and 198% of LTA, respectively for June. June 2019 was the 4th wettest month of June while June 2018 was the 4th driest month of June since records started in 1910.

Rainfall Map	Wales			
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

The differences between the soil moisture deficits and the LTA for the 23 MORECS squares were from -51.8 to -1.5 mm and soil were wetter than the LTA for all the squares in June.

SMD Map	Wales
SMD Charts	Compare to LTA

[1] Note that Resolven and Clog y Fran gauging stations data is currently unavailable

All data are provisional and may be subject to revision.
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River Flows

River flows were between *Normal* and *Exceptionally high* for all the indicator sites across Wales. 8 out of 29 indicator sites (which had flow data available) were classed as *Normal* and 8 sites were *Above normal.* 6 sites were *Notably high* and the remaining 7 sites were *Exceptionally high*.

***South East*:** Flows in the area ranged from 72% (River Ely at St. Fagans) to 203% (River Yscir at Pont ar Yscir) of the June LTA values.

South West: The river flows within this area ranged from 69% (River Western Cleddau at Treffgarne) to 220% (River Teifi at Glanteifi) of the June LTA values.

***North*:** Flows in the area ranged from 64% (River Cefni at Bodffordd) to 752% (River Clwyd at Pont y Cambwll) of the June LTA values.

River Flow Map	Wales
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 June at the indicator sites (8 data available sites) were classed between *Exceptionally low* (Eastwick) to *Notably high* (Llanfair DC Obs). 2 sites were *Below normal* (Pant-y-Lladron and Greenfield Garage). 3 sites were *Normal* (Dodleston Obs, Handley and Broxton Obs). The remaining 1 site was *Above normal* (Pont y Cambwll).

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

Reservoir Storage

At the end of June the cumulative reservoir storage for 15 out of 18 indicator reservoirs were greater than 90% full. All reservoirs were within normal operating ranges 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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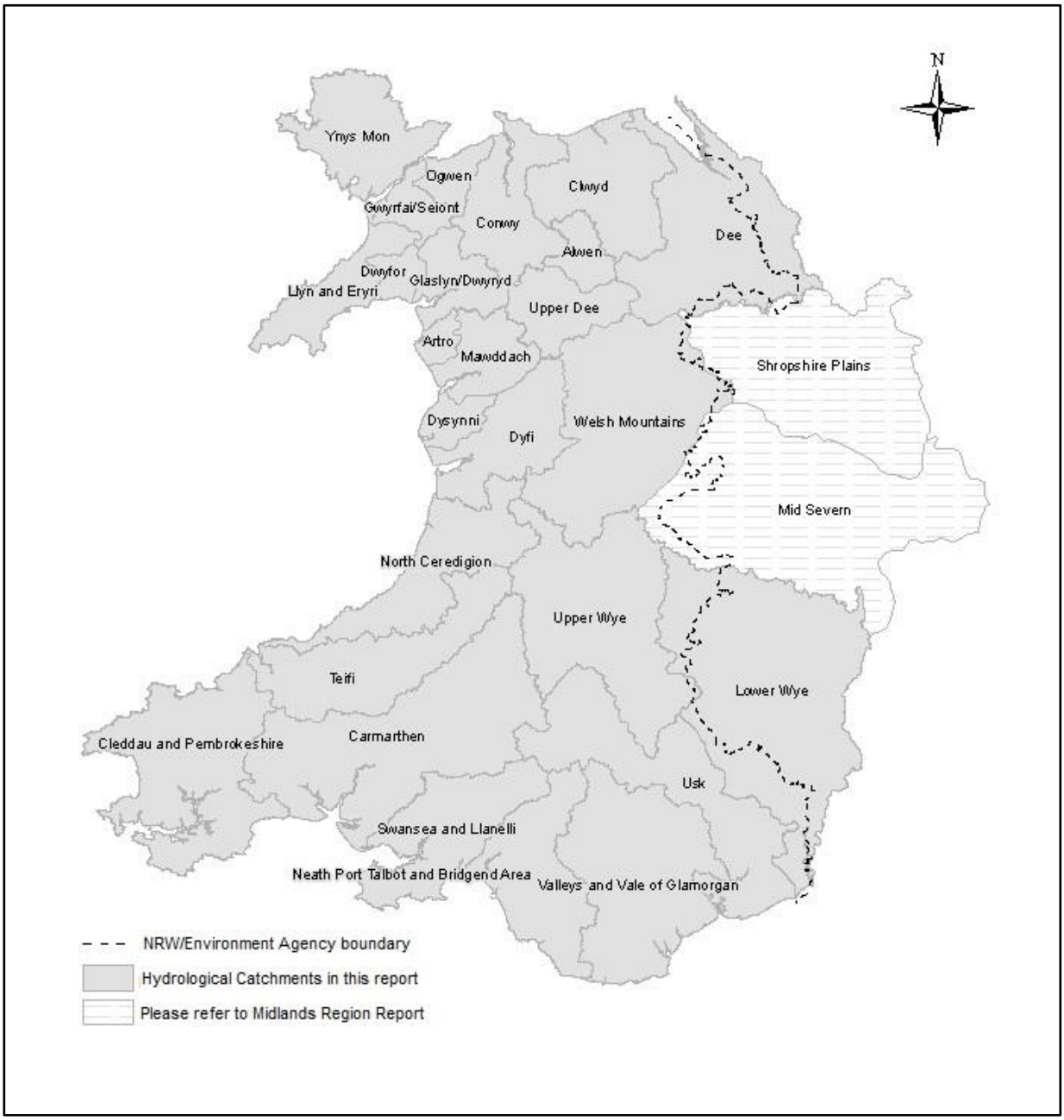

Figure 1: The Natural Resources Wales Water Situation Report features sites in the catchments shown. Parts of the Shropshire Plains and Mid Severn catchments are within Wales. For full information on these catchments, please see the Environment Agency Midlands Water Situation Report.

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

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Rainfall

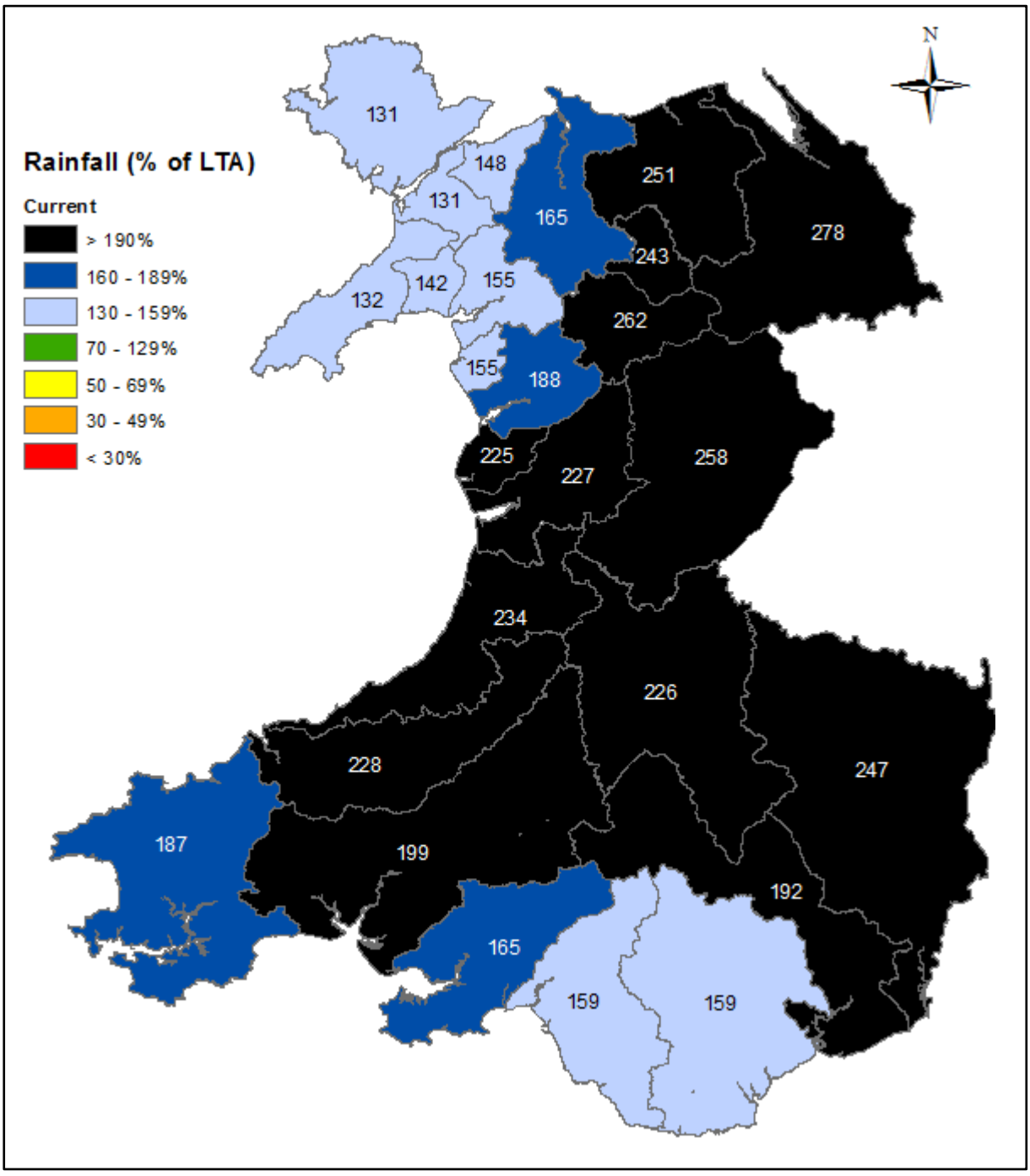

Figure 2: Calculated catchment average June rainfall totals as a percentage of the 1961-90 June long term average for Natural Resources Wales catchments, using NCIC (National Climate Information Centre) data (*Source: Met Office © Crown Copyright).*

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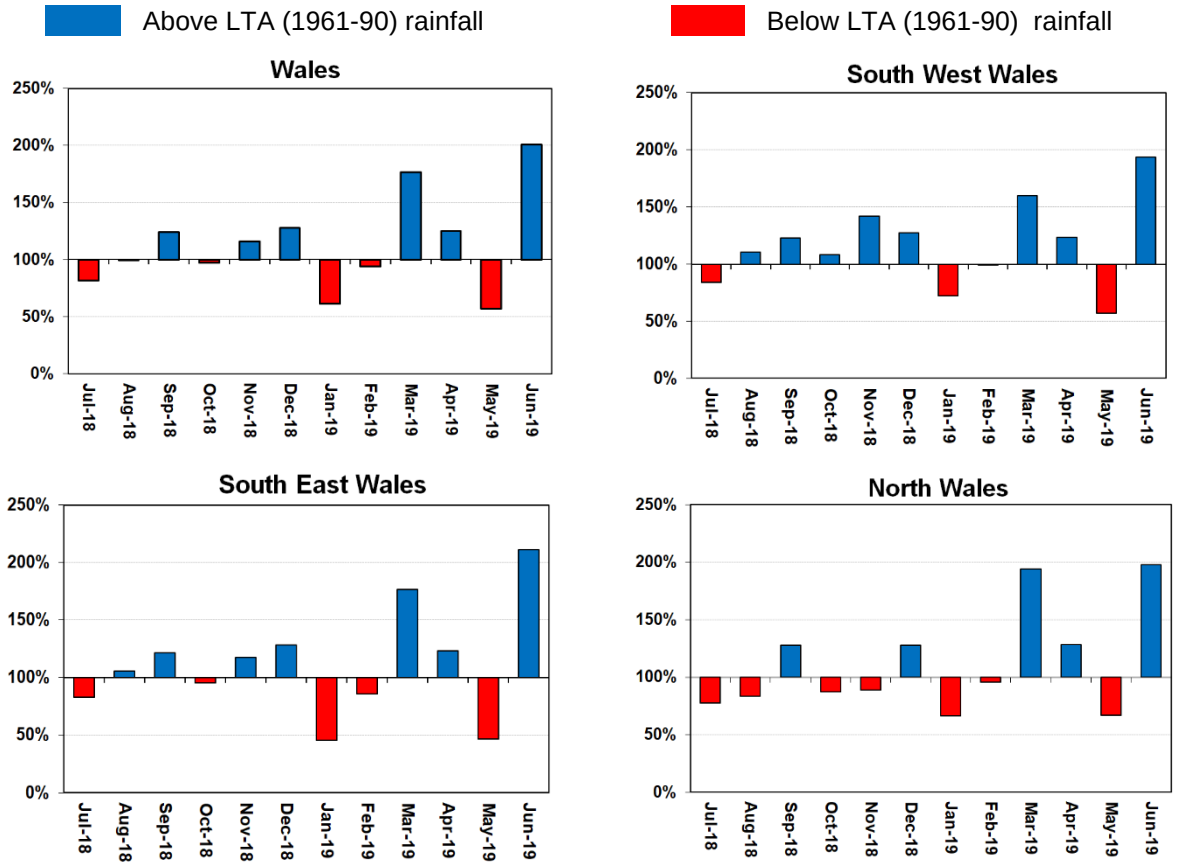
Rainfall Charts

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).*

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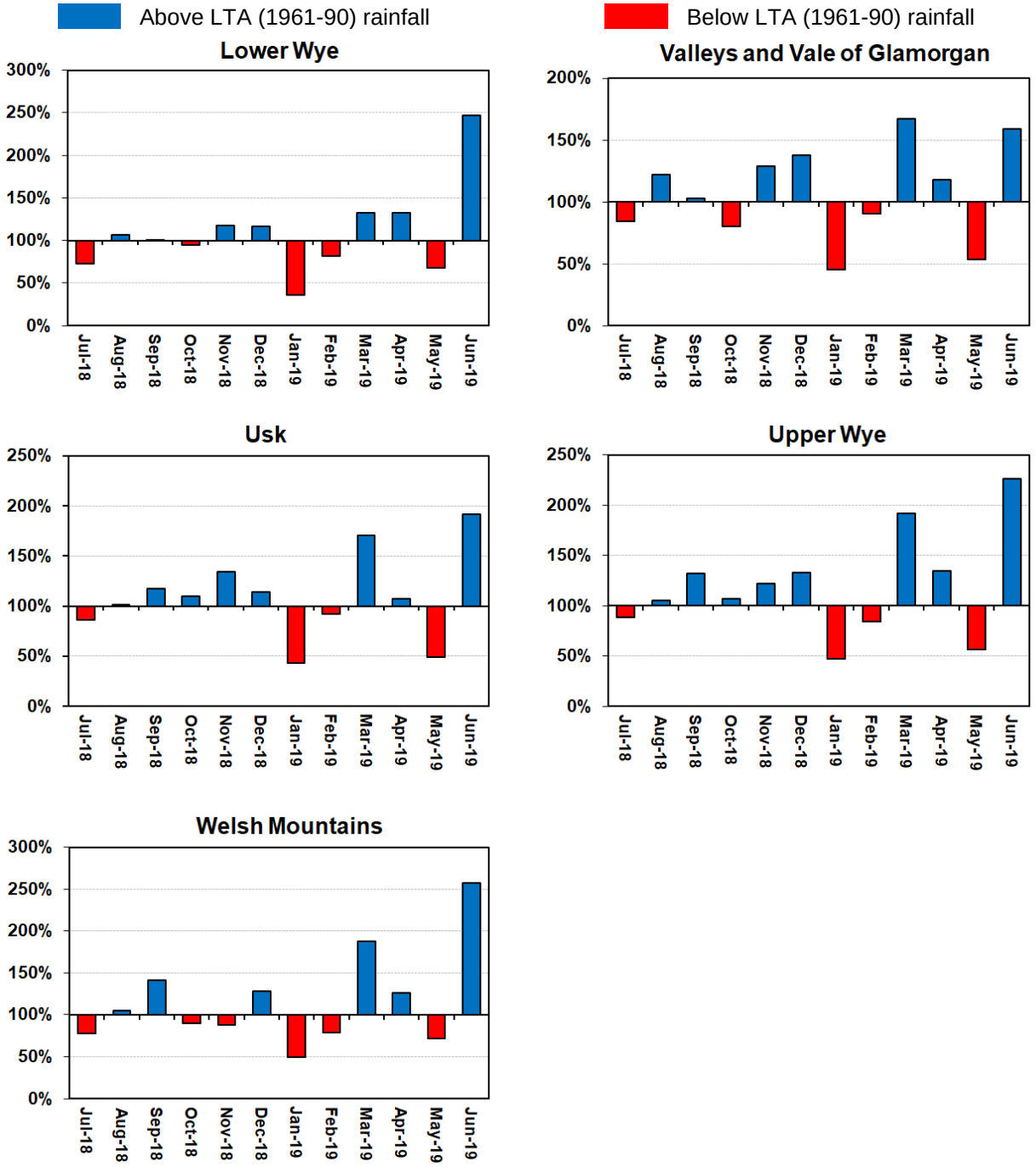
Figure 4: Rainfall Charts: South East Wales



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).*

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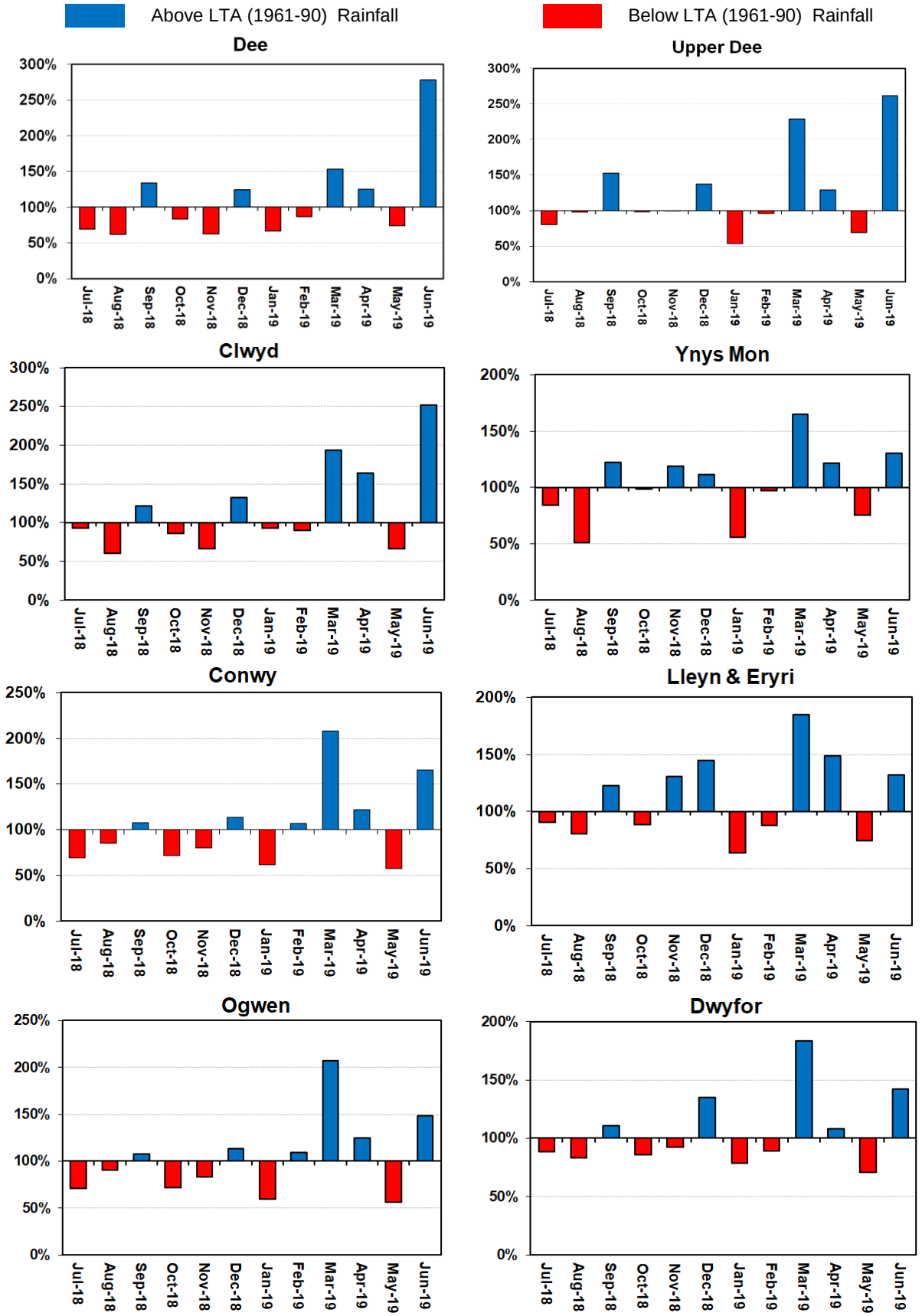
Figure 5: Rainfall Charts: North Wales



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).*

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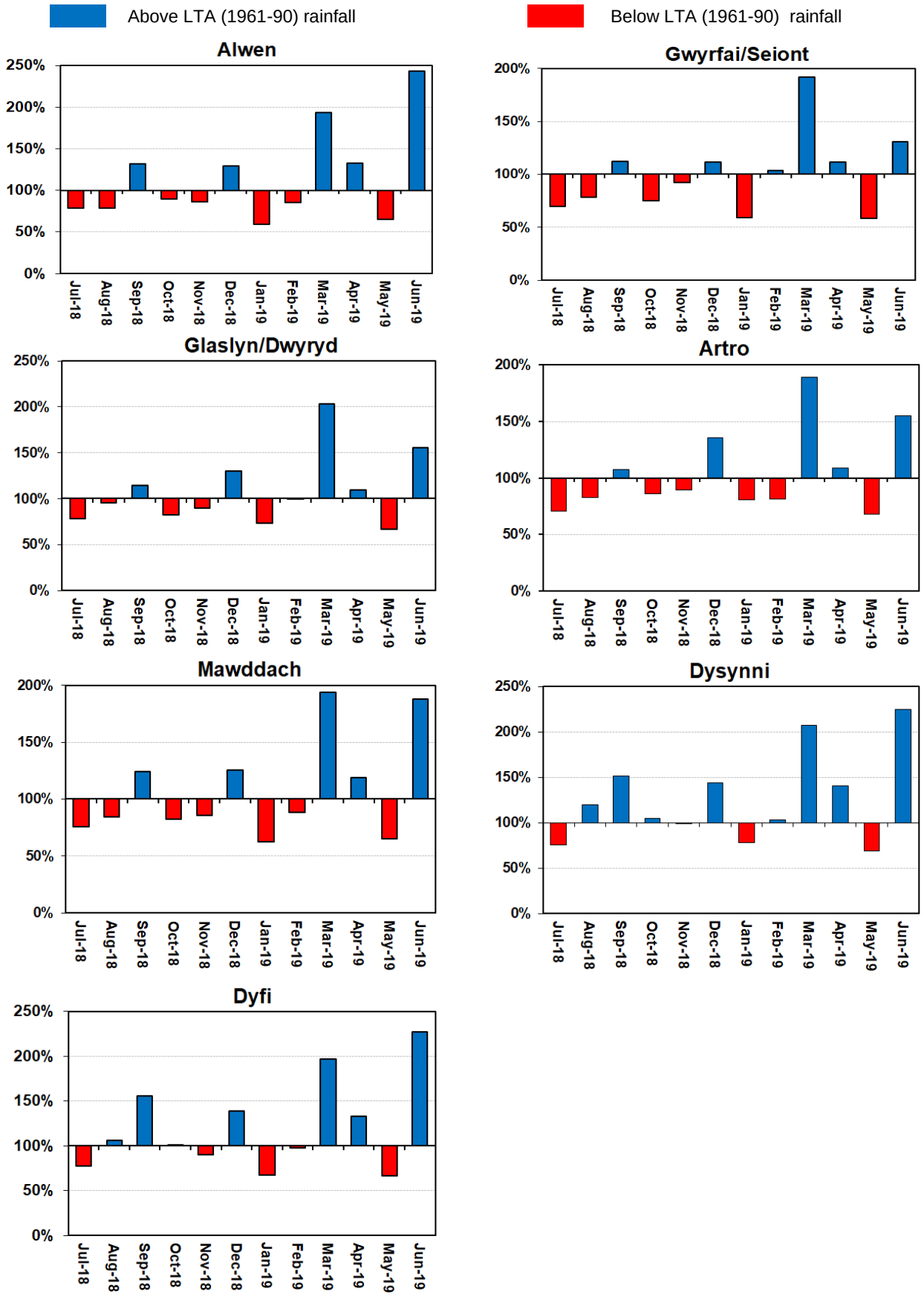

Comparison of monthly rainfall totals to the 1961-90 long term average expressed as percentage for North Wales, using NCIC (National Climate Information Centre) data *(Source: Met Office © Crown Copyright).*

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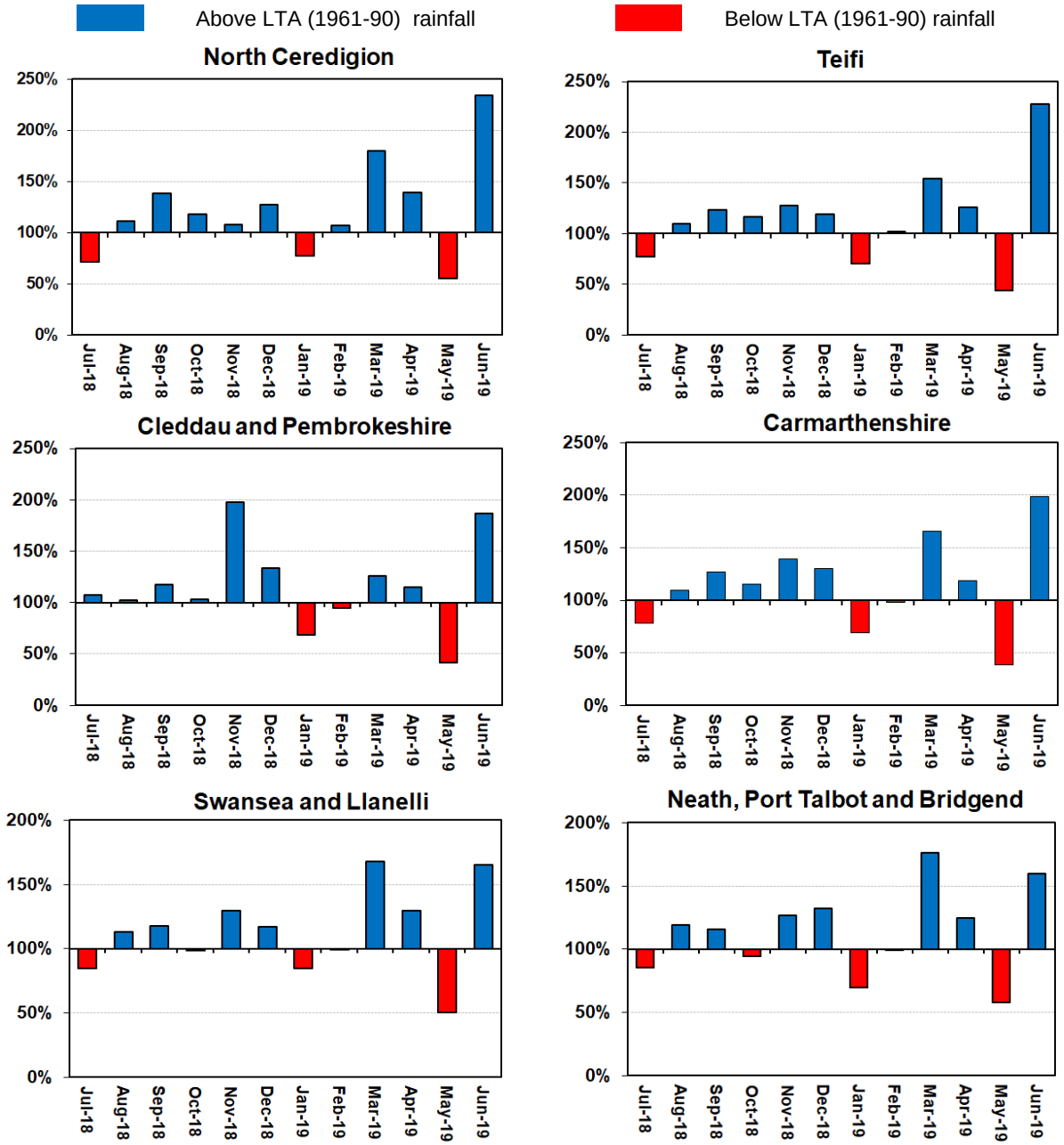
Figure 6: Rainfall Charts: South West Wales



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).*

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Soil Moisture Deficit (SMD)

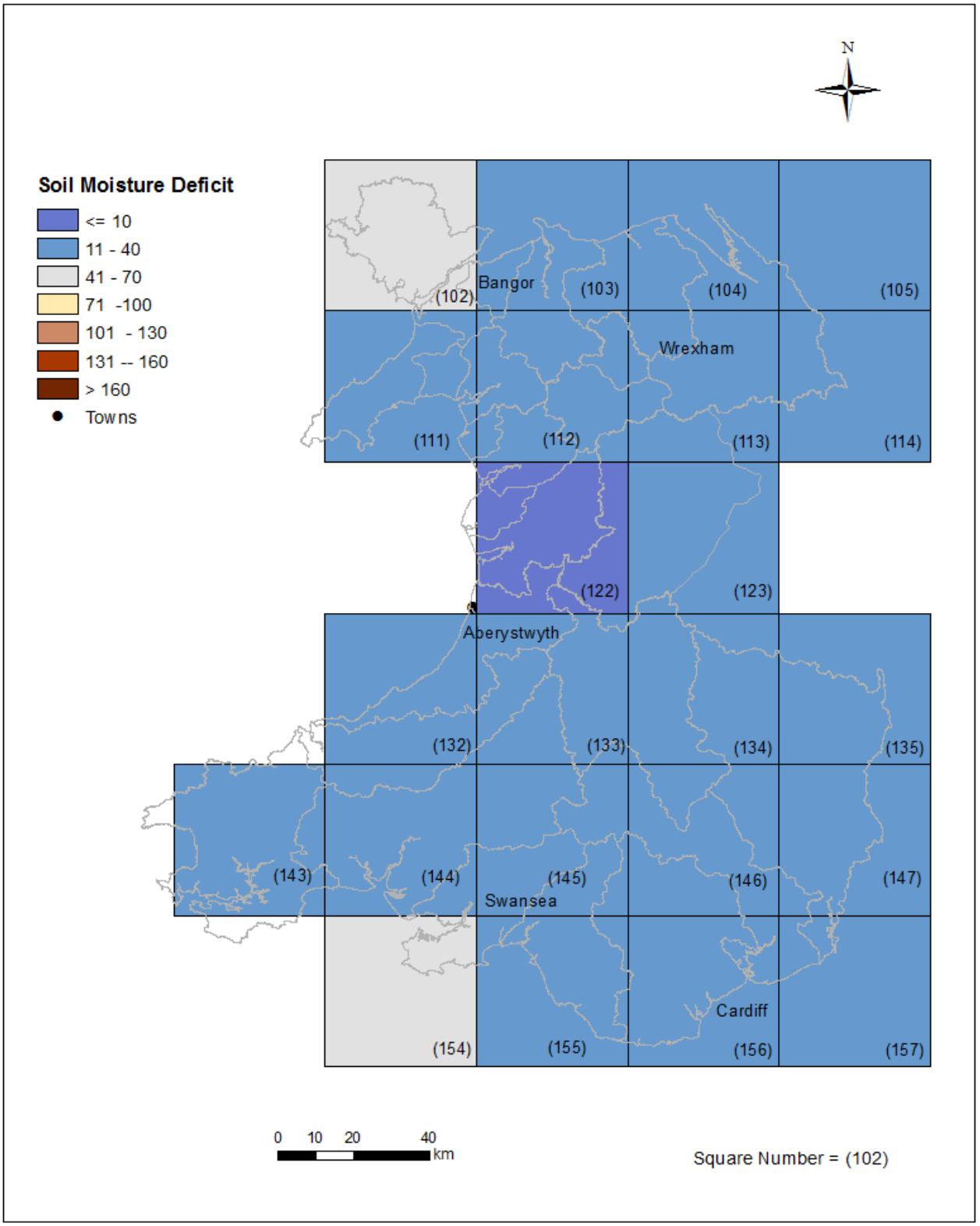

Figure 7: MORECS soil moisture deficits (mm) for June for real land use for Natural Resources Wales ***(Source: Met Office © Crown Copyright).***

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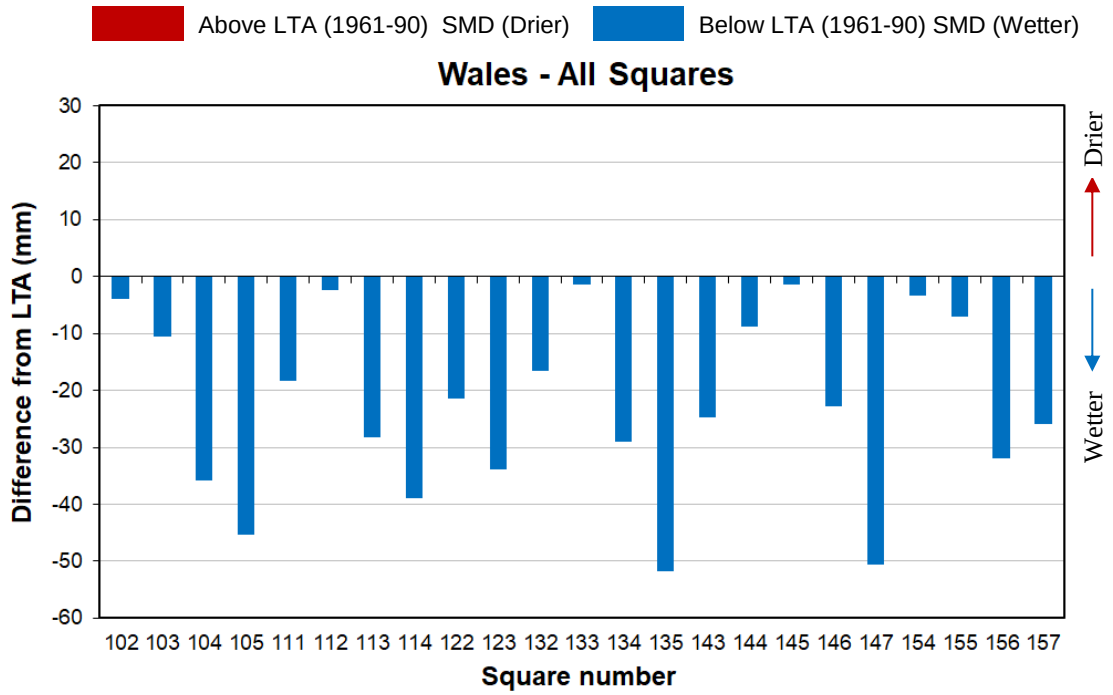

Figure 8: MORECS month end soil moisture deficits difference (mm) from the 1961-90 long term monthly average (LTA) for June for real land use for Natural Resources Wales squares (*Source: Met Office © Crown Copyright*).

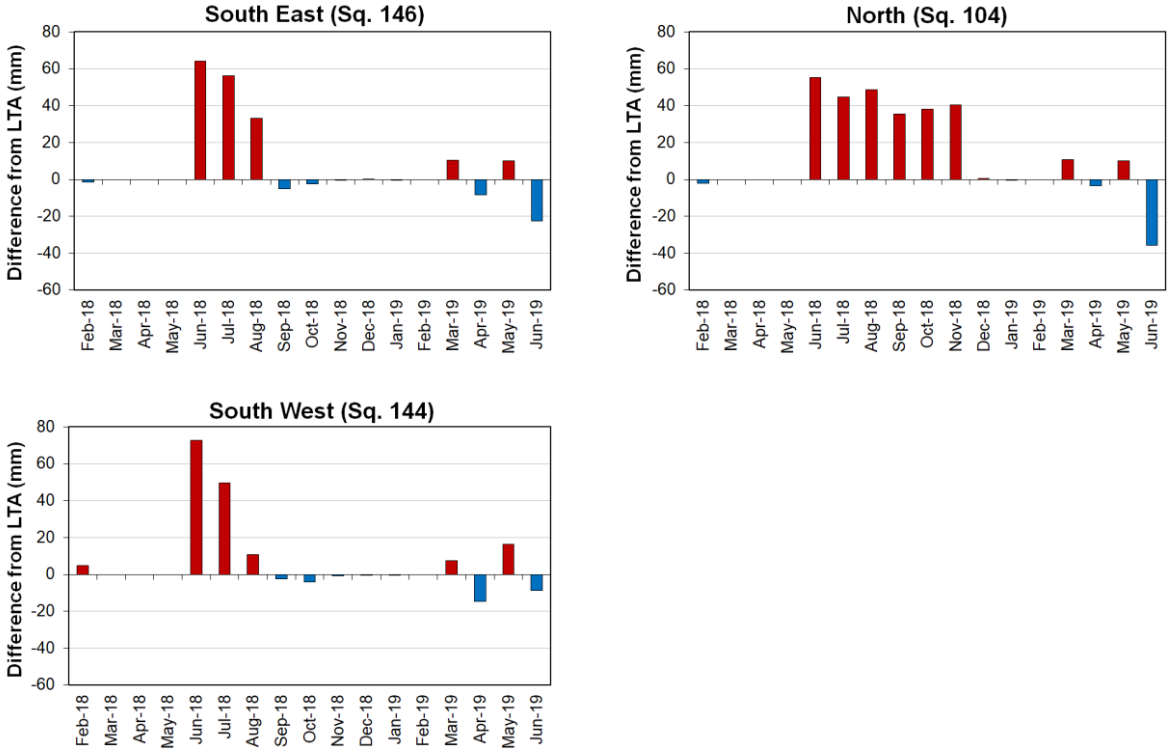

Figure 9: MORECS month end soil moisture deficit difference (mm) from the 1961-90 long term monthly average (LTA) for real land use for South East, North and South West (*Source: Met Office © Crown Copyright*). (Note: no LTA available for Natural Resources Wales.)

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River Flow

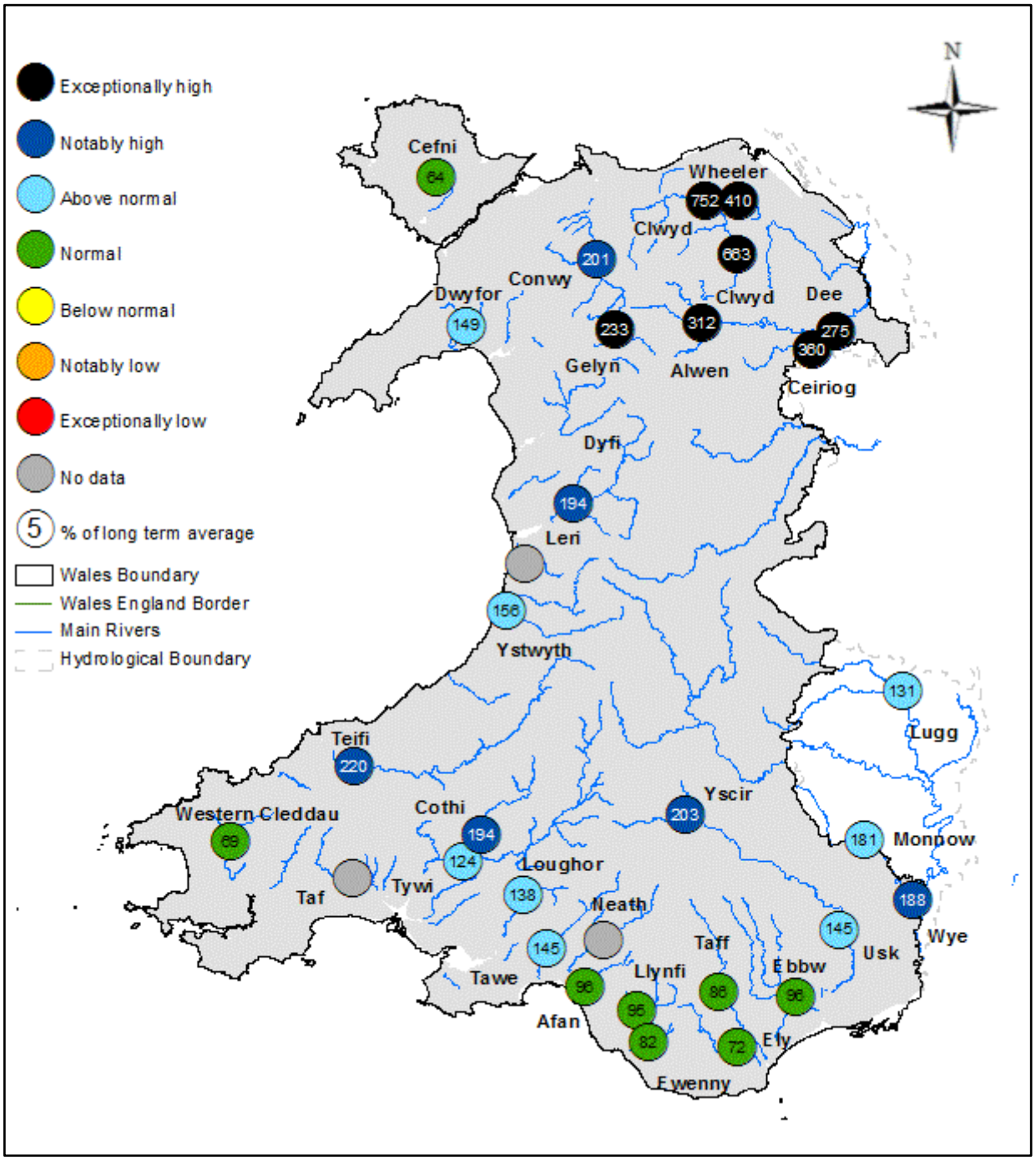

Figure 10: Monthly mean river flow for June, classed relative to analysis of historic June monthly means *(Source: Natural Resources Wales).*

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SITE NAME	RIVER	June 2019			June 2018		June LTA		
		Class	% of LTA	Flow (m3/s)	% of LTA	Flow (m3/s)	LTA	Min Monthly Mean (m3/s)	Max Monthly Mean (m3/s)
River Flow Sites : South East Area									
Butts Bridge	Lugg	Above normal	131%	4.05	47%	1.45	3.09	0.80	8.66
Grosmont	Monnow	Above normal	181%	5.02	69%	1.91	2.78	0.67	8.75
Pont ar Yscir	Yscir	Notably high	203%	1.52	31%	0.23	0.75	0.21	2.75
Pontypridd	Taff	Normal	86%	8.19	42%	4.02	9.52	3.52	34.50
Redbrook	Wye	Notably high	188%	62.30	59%	19.70	33.22	11.00	112.00
Rhiwderin	Ebbw	Normal	96%	3.38	50%	1.76	3.53	1.33	11.10
St Fagans	Ely	Normal	72%	1.40	47%	0.91	1.95	0.66	5.92
Trostrey Weir	Usk	Above normal	145%	16.70	53%	6.13	11.49	4.48	27.90
River Flow Sites : North Area									
Bodfari	Wheeler	Exceptionally high	410%	2.09	82%	0.42	0.51	0.26	1.04
Bodffordd	Cefni	Normal	64%	0.07	55%	0.06	0.11	0.02	0.54
Brynkinalt Weir	Ceiriog	Exceptionally high	360%	5.33	46%	0.68	1.48	0.44	5.22
Cwmlanerch	Conwy	Notably high	201%	17.10	41%	3.52	8.50	1.63	24.90
Cynefail	Gelyn	Exceptionally high	233%	0.70	30%	0.09	0.30	0.06	0.89
Dol y Bont	Leri	N/A	No data	No data	No data	No data	0.82	0.17	4.55
Druid	Alwen	Exceptionally high	312%	6.14	72%	1.41	1.97	0.52	4.89
Dyfi bridge	Dyfi	Notably high	194%	18.70	No data	No data	9.64	1.62	25.40
Garndolbenmaen	Dwyfor	Above normal	149%	2.06	No data	No data	1.38	0.31	5.01
Manley Hall	Dee	Exceptionally high	275%	40.40	67%	9.91	14.69	7.71	41.50
Pont y Cambwll	Clwyd	Exceptionally high	752%	20.90	56%	1.56	2.78	1.06	9.42
Ruthin Weir	Clwyd	Exceptionally high	663%	3.58	31%	0.17	0.54	0.13	2.19
River Flow Sites : South West Area									
Capel Dewi	Tywi	Above normal	124%	19.60	20%	3.20	15.87	3.74	61.20
Clog y Fran	Taf	N/A	No data	No data	43%	1.27	2.93	0.78	9.41
Coytrahen	Llynfi	Normal	95%	1.18	35%	0.43	1.24	0.37	4.33
Felin Mynachdy	Cothi	Notably high	194%	9.11	24%	1.11	4.70	0.80	18.70
Glanteifi	Teifi	Notably high	220%	26.50	39%	4.74	12.06	2.97	52.00
Keepers Lodge	Ewenny	Normal	82%	0.75	55%	0.50	0.91	0.41	2.00
Marcroft	Afan	Normal	96%	2.86	48%	1.42	2.97	0.75	8.79
Pont Llolwyn	Ystwyth	Above normal	156%	8.55	18%	0.47	5.48	0.62	14.90
Treffgarne *	Western Cleddau	Normal	69%	1.23	55%	0.98	1.79	0.63	6.79
Resolven	Neath	N/A	No data	No data	40%	1.77	4.47	0.57	14.30
Tir-y-Dail	Loughor	Above normal	138%	1.35	52%	0.51	0.98	0.30	2.98
Ynystanglws	Tawe	Above normal	145%	8.45	34%	1.96	5.81	1.35	19.60

Figure 11: Monthly mean river flow for June with comparison against previous year expressed as a percentage of the June long term average and classed relative to analysis of historic June 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. There was no flow data for Resolven due to the maintainance work at the gauge station)

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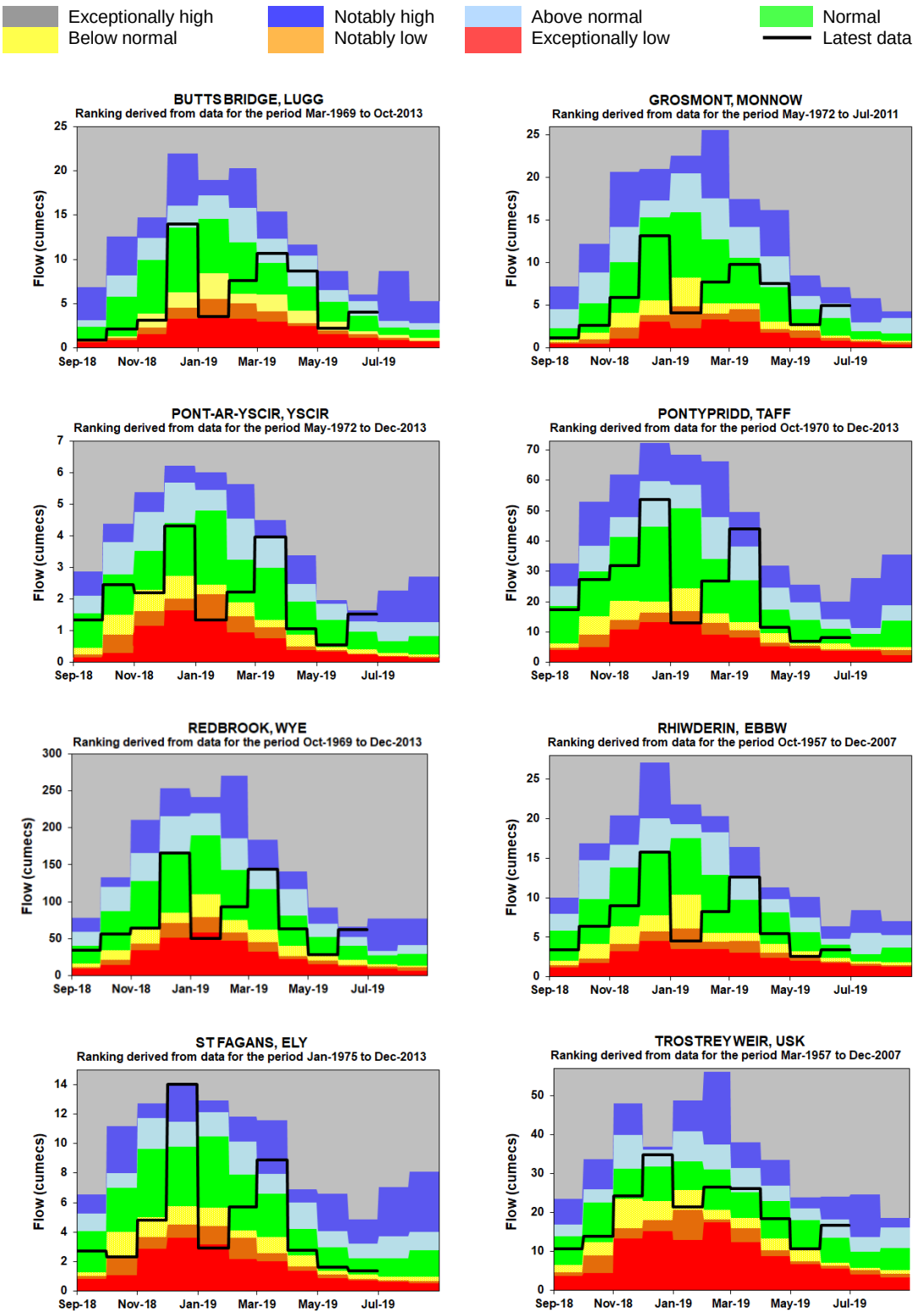
River Flow Charts

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*).

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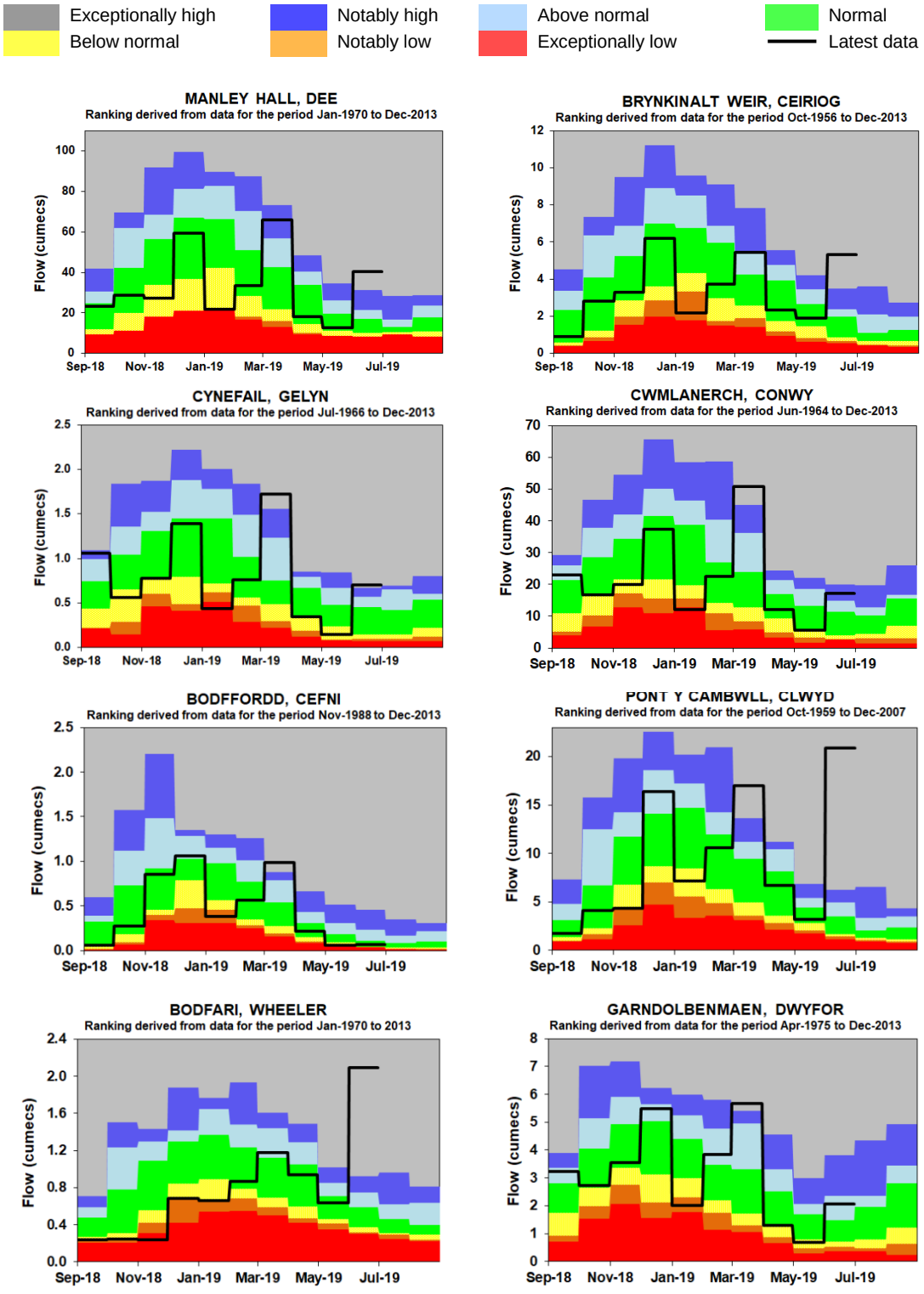
Figure 13: River Flow Charts: North Wales



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

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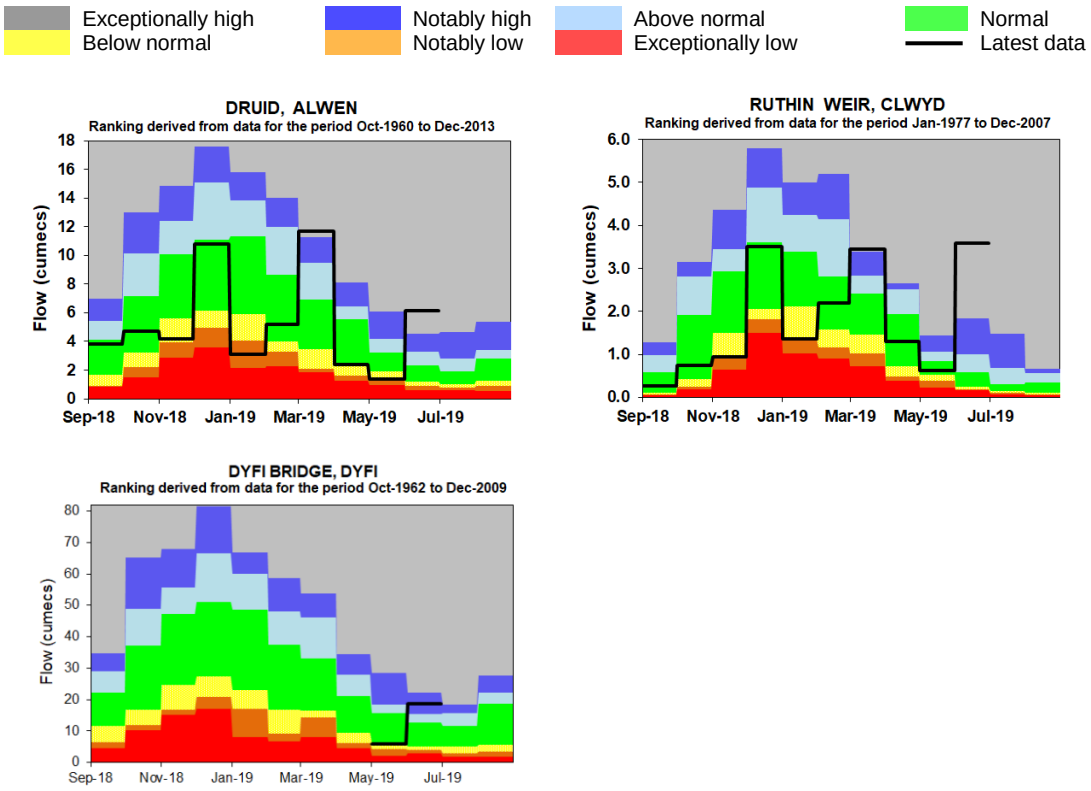
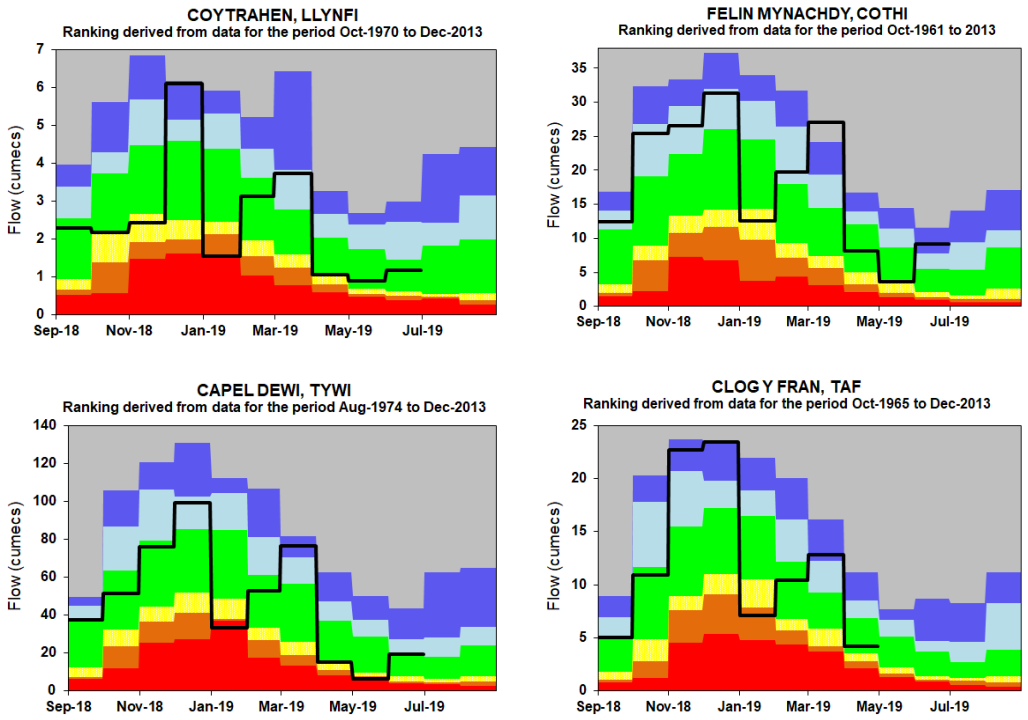


(Please note that there is no flow data for Dyfi Bridge between Sept 2018 and April 2019)

Figure 14: River Flow Charts: South West Wales



(Please note that there is no data for Clog y Fran for May and June 2019)

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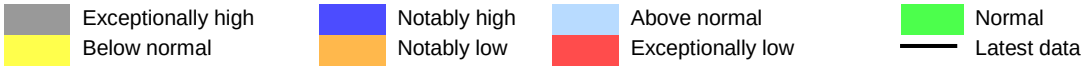

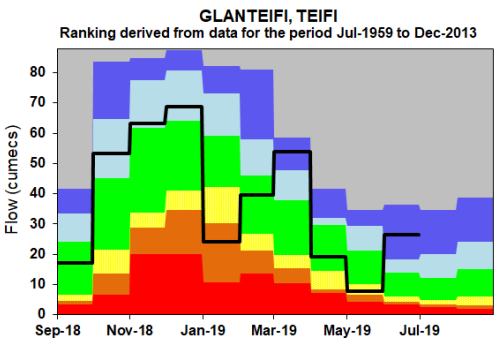

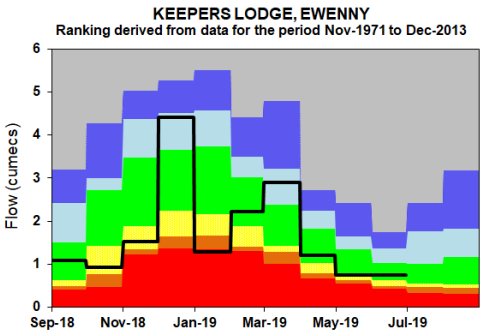

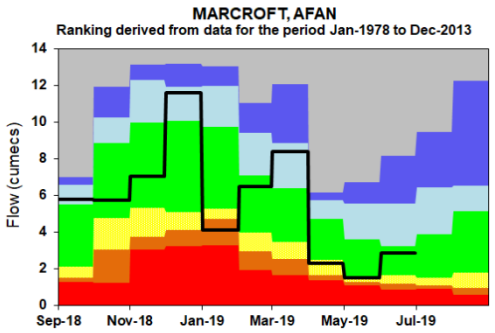

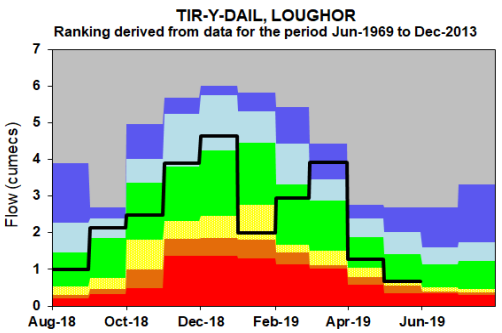

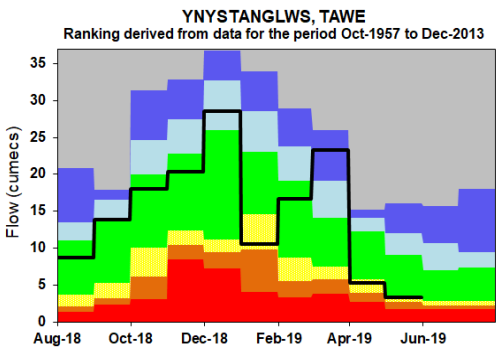

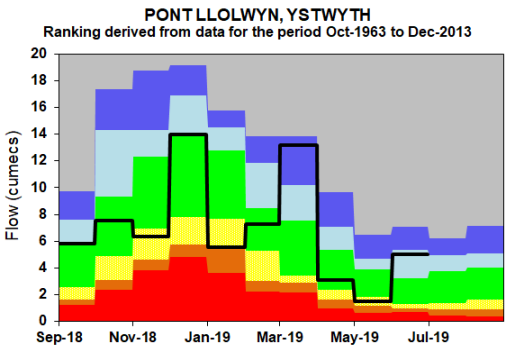

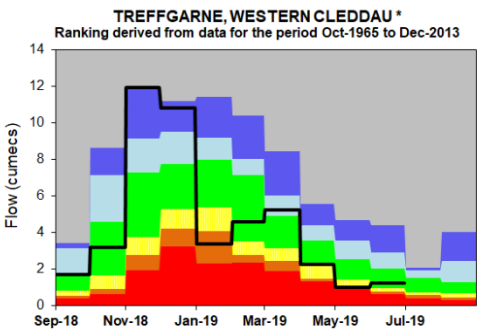

Monthly mean river flows for the last 10 months classed relative to the analysis of historic river levels. *(Source: Natural Resources Wales).*

(* 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 flow data for Resolven, therefore the graph for this station is not shown here.)

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Groundwater Levels

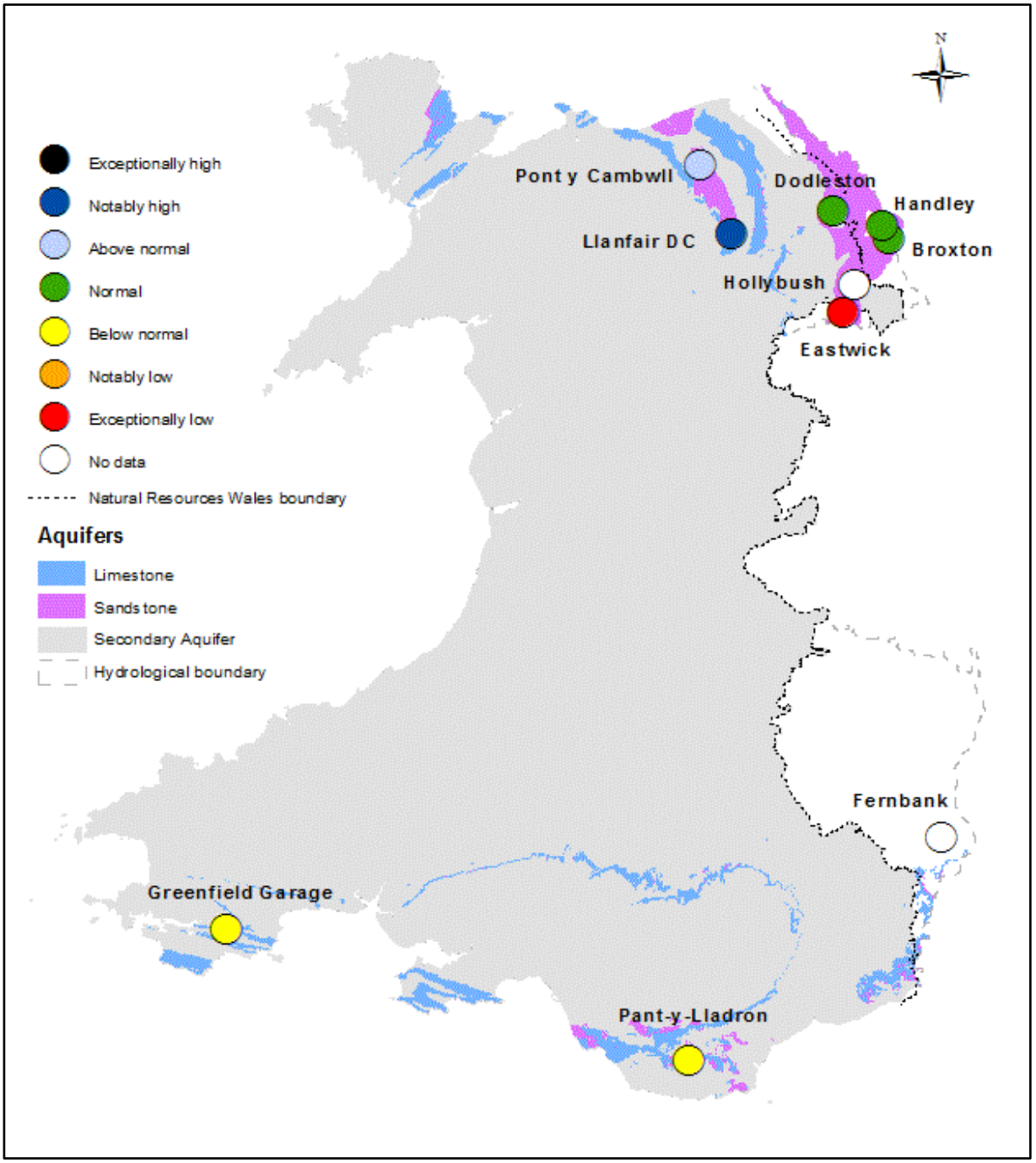

Figure 15: Groundwater levels at the end of month classed relative to an analysis of historic June groundwater levels *(Source: Natural Resources Wales and Environment Agency).*

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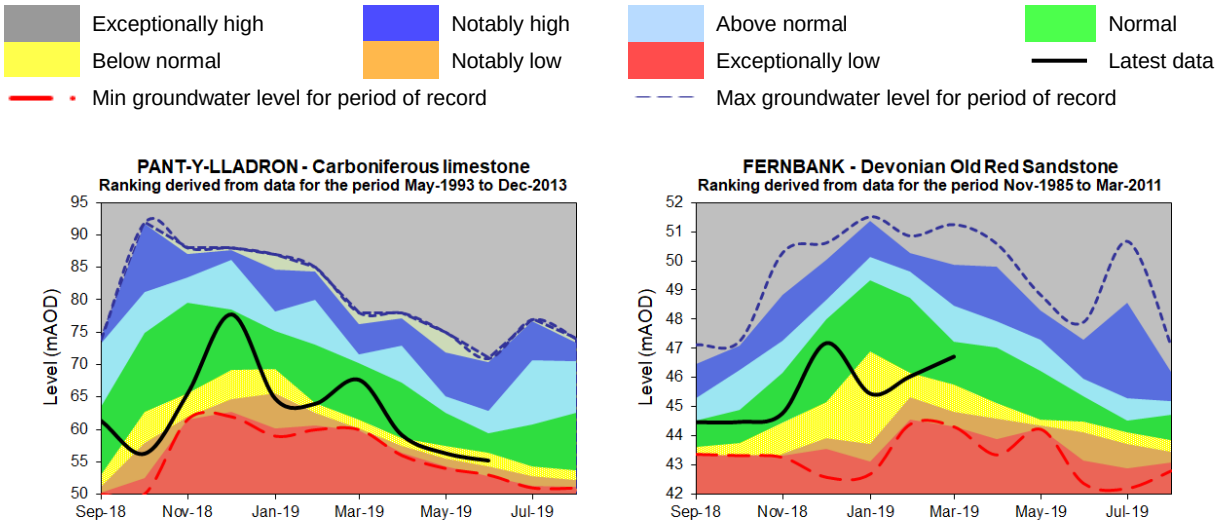
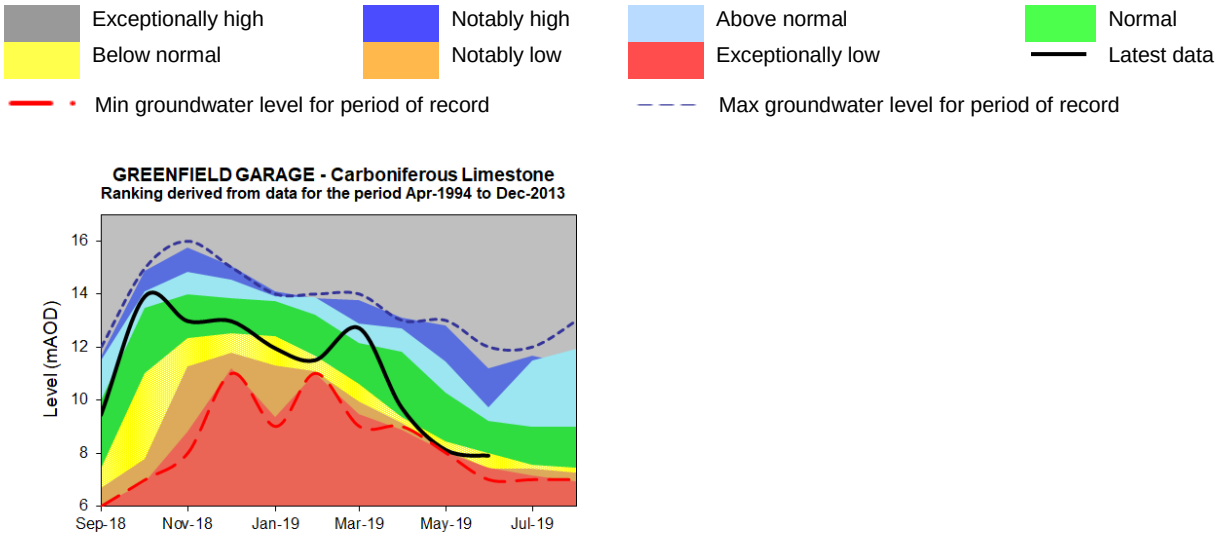
Groundwater charts

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).*

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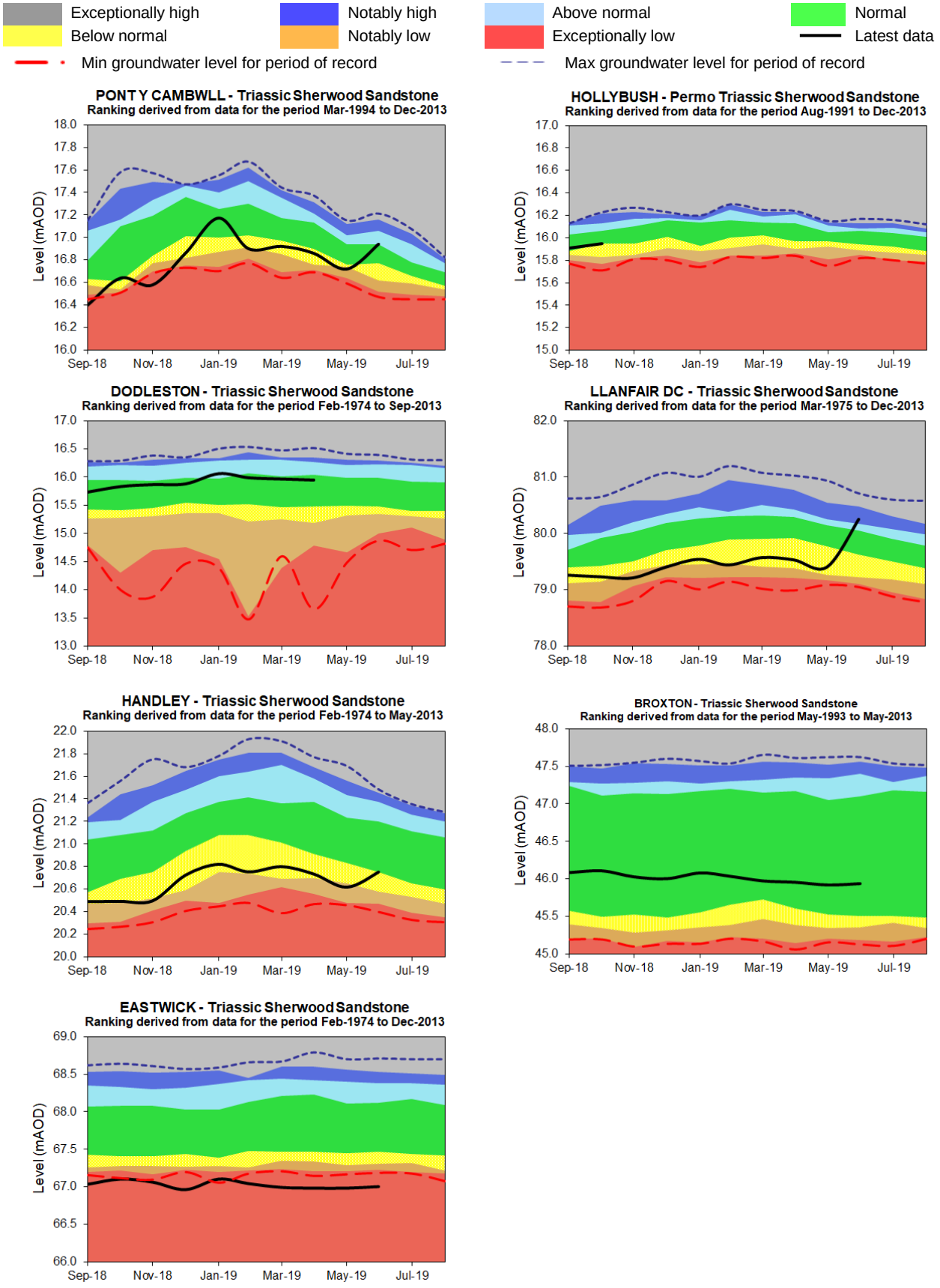
Figure 18: Groundwater level charts: North Wales



End of month groundwater levels for the past 10 months for index sites *(Source: Natural Resources Wales and Environment Agency)*. (Please note that data is not available for November 2018 -June 2019 for Hollybush. The data for October 2018 for this station is taken on 9th October 2018)

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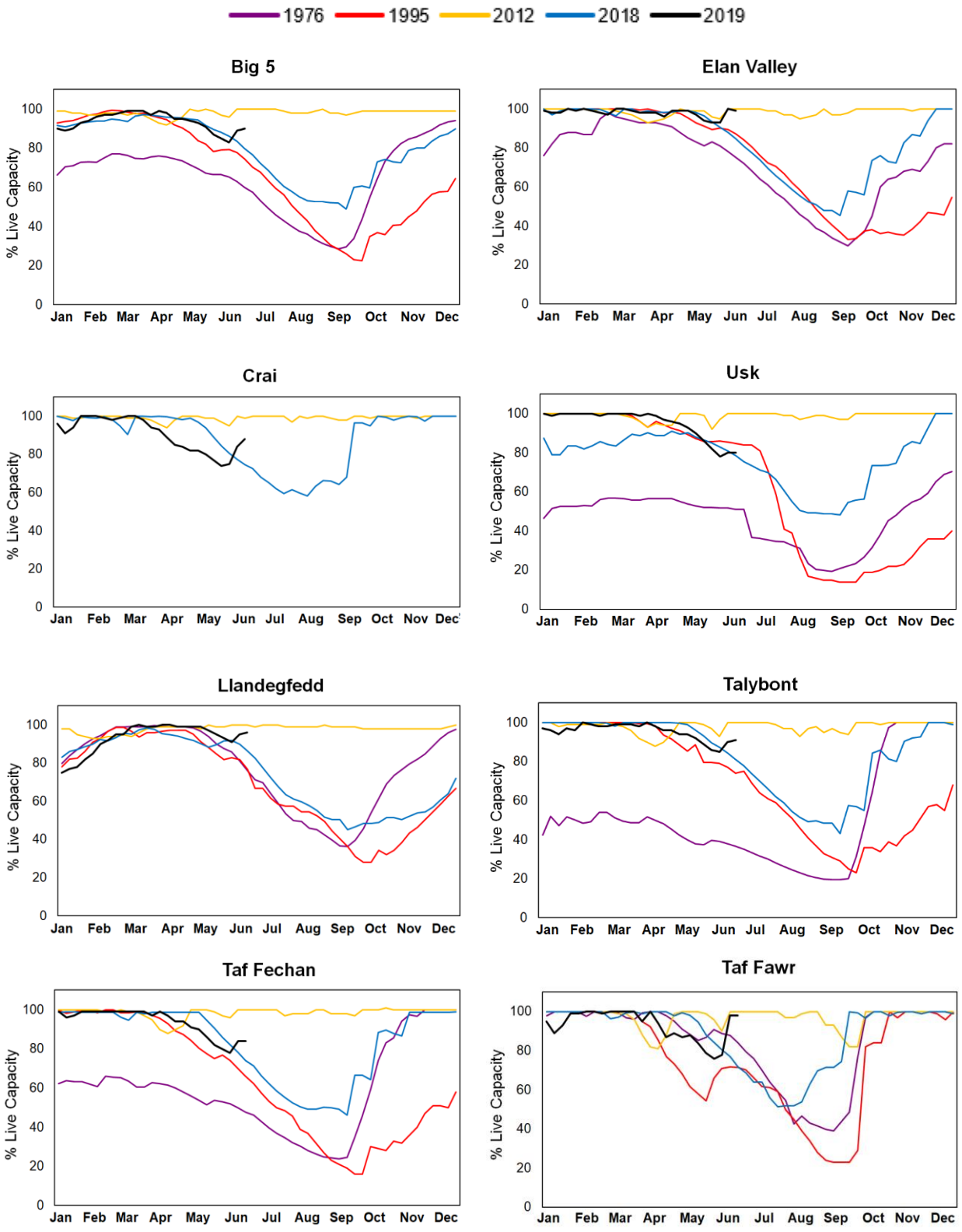
Reservoir Storage

Figure 19: Reservoir charts: South East Wales



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

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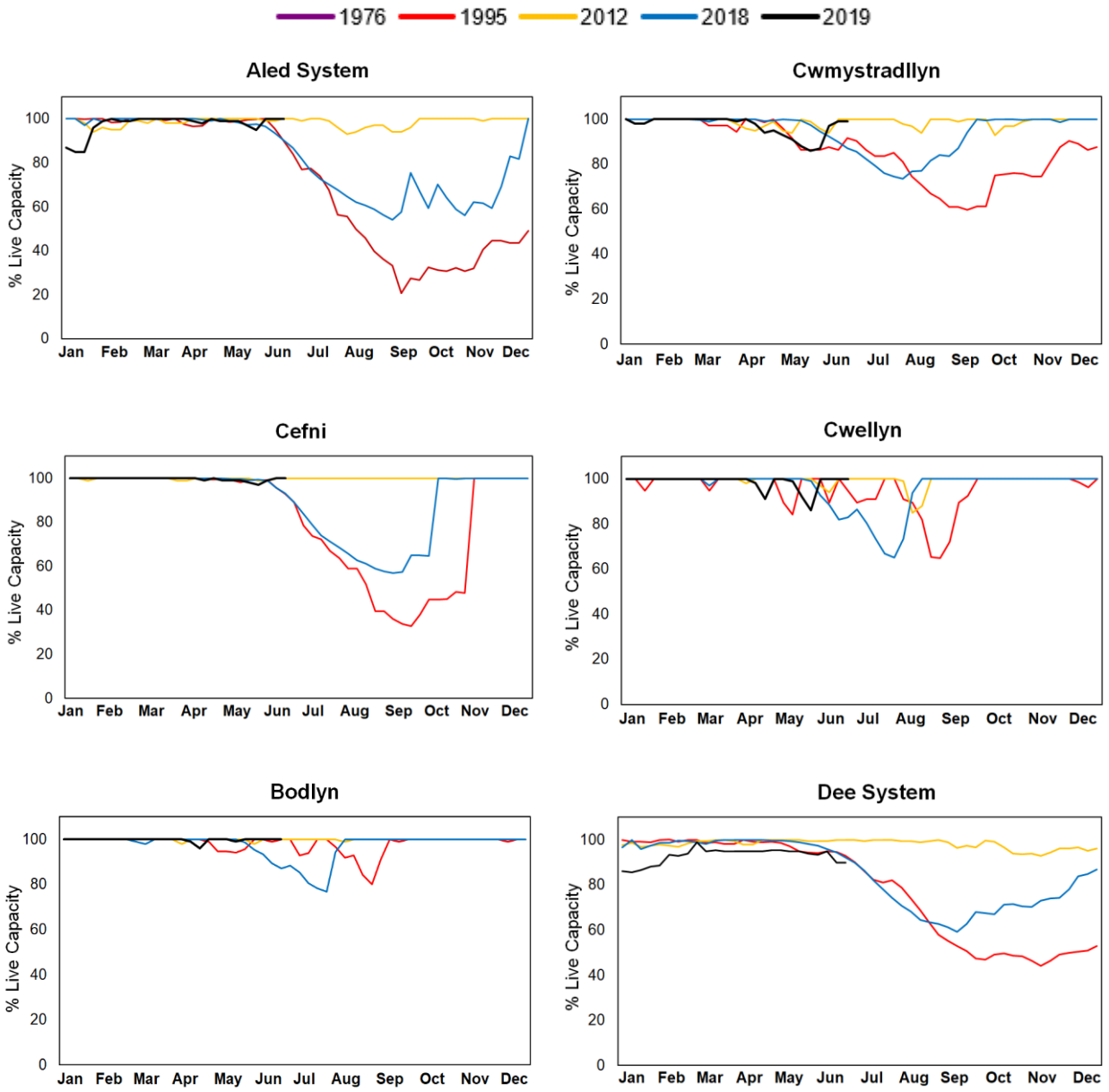
Figure 20: Reservoirs charts: North Wales



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

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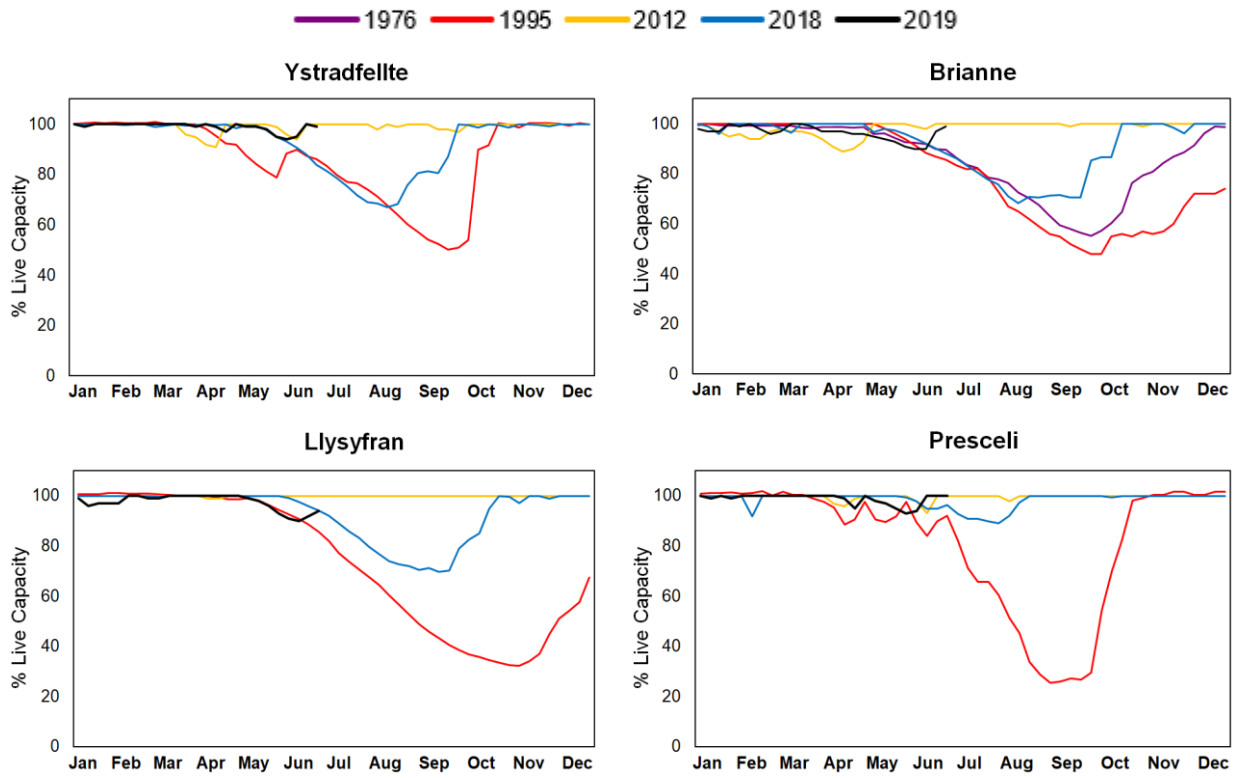
Figure 21: Reservoirs charts: South West Wales



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