

monthly water situation report

Midlands Region

Summary – May 2011

River Flow- Mean monthly flows remained 'exceptionally low' at the majority of sites across Midlands.

Reservoir Storage- Storage continued to show a steep decline at several key reservoirs including Tittesworth, Derwent and Elan, although remained closer to the LTA (long term average) at Clywedog, Draycote, Carsington and the Dove reservoirs.

Groundwater Levels- Levels continued to decline at the majority of sites and were notably low at Heathlanes, Four Crosses and Rider Point.

Rainfall- Totals across Midlands were closer to normal and overall 86% of the LTA was recorded.

Soil Moisture Deficit- Soils remained drier than the LTA. The end of the month soil moisture deficit in Central and East areas ranged from 80 to 107 mm.

Given the exceptionally dry March and April we will continue to closely monitor river flows, groundwater and reservoir levels across Midlands.

River Flow

The monthly mean flow at the majority of sites was lower than April, despite scattered showers throughout May resulting in rainfall closer to the LTA. However, these caused only temporary recovery of flows and overall the majority of sites in both the main River Severn and Trent were 'exceptionally low' for the time of year. In the Avon catchment flows at Stareton were 'notably low' and Evesham was 'below normal', despite the lower rainfall in this catchment. Ebley Mill on the Frome and Llanyblodwel up in the headwaters of the Severn were also 'notably low'. In contrast, the mean flow at Hawbridge on the Severn and Walcot on the Tern were the lowest May mean flows recorded. All sites on the Trent were 'exceptionally low' with the exception of tributaries at the bottom of the Trent; Worksop on the Ryton and Auckley on the Torne. Great Bridgford and Yoxall in the Upper Trent catchment both recorded the lowest May mean monthly flow on record.

Please refer to [Midlands River Flow Map](#) and [Midlands River Flow Charts](#).

Water Abstraction Restrictions (as of 06-06-11)

| Abstraction Licence Restrictions | | |
|----------------------------------|---|---|
| | Rivers & (Stations) Restricted | Thresholds Crossed |
| Midlands West | Badsey Brook (Offenham) Bailey Brook (Ternhill on Bailey) Coley Brook (Coley Mill) River Leadon (Wedderburn Bridge) Mor Brook (Oak Cottage) (Dowles Brook) River Meese (Tibberton) | Primary and Secondary Primary Primary Tertiary and Quaternary Primary |
| | River Perry (Yeaton) | Primary, Secondary and Quaternary |
| | River Roden (Rodington) | Primary, Secondary and Quaternary |

| | | |
|-------------------------|---|--|
| | River Severn (Deerhurst) River Stour (Kidderminster) River Teme (Tenbury) River Tern (Ternhill) River Tern (Walcott) River Worfe (Burcote) River Rea (Hookagate/Cound) | Quaternary Primary Primary, Secondary and Tertiary Quaternary Primary and Secondary Primary and Secondary Secondary Secondary |
| Midlands Central | Trent basin River Swarbourne (Wychnor) Severn basin River Arrow (Broom) | Primary Secondary |
| Midlands East | River Derwent (Derby St Mary's) Soar (Rothley Brook) Soar (Kegworth) Maun and Meden (Perlethorpe and Whitewater Bridge) Poulter (Cukney) Ryton (Blyth) Torn (Auckley) | Secondary, Tertiary and Quaternary Primary Primary Tertiary Tertiary Primary, Secondary and Tertiary Quaternary |

Table 1. Water abstraction licence restrictions as of 06-06-11. Please note: The *No. of thresholds crossed* does not refer to the individual numbers of abstraction licences restricted. It instead relates to the number of Hands off flow thresholds that are currently in force at time of print (i.e. Primary, Secondary etc.).

As of 06-06-11 there are 40 water abstraction licence restrictions in place across the Midlands Region.

River Severn Operations (as of 06-06-11)

The River Severn is regulated to maintain a minimum flow at Bewdley gauging station. This ensures sufficient water flows along the river to support environmental and water supply requirements. Flows at Bewdley are monitored between April and mid-October and regulation instigated when flows drop below a specific threshold at Bewdley.

Current Situation:

| Water Supply (ml/d) | Total Releases | Normal Releases | Regulation Releases | Flood Drawdown Releases |
|-------------------------------|----------------|-----------------|---------------------|-------------------------|
| Llyn Clywedog | 250 | 18 | 232 | |
| Lake Vyrnwy | 150 | 45 | 105 | |
| Shropshire Groundwater Scheme | 0 | | | |

Table 2. River Severn Operational Releases as of 06-06-11.

River Wye Operations (as of 06-06-11)

Flows in the River Wye at Redbrook have dropped below the regulation threshold of 1209 MI/d. Therefore, regulation releases are currently being made from the Elan reservoirs.

Reservoir Storage

Rainfall resulted in a small recovery in storage at Clywedog and Vyrnwy but most other reservoirs continued to decrease over May. Storage was well below the LTA at Derwent, Tittesworth, Blithfield and Elan, in response to steep declines in storage since March. The largest decline was at Tittesworth, which decreased by 16% over the month, to 65% storage at the end of May. However, Clywedog, the Dove Reservoirs, Ogston and Carsington and Draycote remained close to or above the LTA storage.

Please refer to the [Midlands Reservoir Charts](#)

Groundwater Levels

Groundwater levels receded at all monitoring sites during May. The lowest levels, relative to the LTA, were in the Sherwood Sandstone in the west of the Midlands, with Heathlanes and Four Crosses both 'notably low' by the end of May. No recent data was available for Anthonys Cross but April data indicated levels were also 'notably low'. Levels at Ram Hall remained within the 'normal' range. All sites in East Area also saw a decline in level, including Watch Hill, although it remained in the 'normal' range. Levels at Rider Point remained in the 'notably low' range and Crossley Hill and Hodhill Farm were 'below normal'.

Please refer to the [Midlands Groundwater Map](#) and [Midlands Groundwater Charts](#)

Rainfall

Compared to March and April, rainfall was closer to the LTA across the Midlands (86% LTA) in response to showery weather throughout the month, although there were no periods of prolonged rainfall. Central Area was the wettest (54 mm), which was equivalent to 93% of the LTA. Within the Severn catchment, the largest rainfall totals occurred in the Welsh Uplands where 91mm fell (outside the Midlands boundary) and the driest catchment was the Avon (47 mm). In the Trent catchment the upland areas were wettest, with 63mm recorded in the Dove catchment, compared to only 40mm in the Soar.

The additional rainfall in May resulted in spring totals for Midlands not being as low as feared following the exceptionally dry March and April. However, accumulated rainfall over the preceding 7 month period (November to May) was the driest on record (going back to 1910).

Please refer to the [Midlands Rainfall Map](#) and [Midlands Rainfall Charts](#)

Soil Moisture Deficit

The showery weather was insufficient to cause any notable recharge of soil moisture deficits during May and these continued to increase (become drier) throughout the month. For example, in the Severn catchment the end of month SMD was 96 mm, compared to the LTA of 71 mm. The end of month SMD in the Derwent catchment was 99 mm, compared to the LTA of 71 mm. Across Central and East areas the SMD was particularly dry and ranged from 80 up to 107 mm in some catchments.

Please refer to the SMD Map and [Midlands SMD Charts](#)

Environmental Impact

There is currently one low flow augmentation site switched on in East area and seven sites in West area.

Flood Watch/ Warnings

Current flood alert/ warning status in your area can be obtained by visiting the [Environment Agency Website](#)

Weather Outlook

For an up-to-date weather outlook for the month of June in your area please visit the [Met Office Website](#)

Regional Coverage

Please refer to map below, illustrating both the Midlands regional boundary and the Severn/Trent hydrological boundary.



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You may also wish to read the water situation report for adjoining [EA Wales](#) Region.

We currently do not supply a Welsh version of the Midlands Water Situation Report. If you would like to express an interest in receiving this report in Welsh please contact us.

Author: [Sarah Hainie](#) Contact details: 01543 404970

Rainfall Map for May 2011

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% of LTA

Midlands Boundary

PofLTA

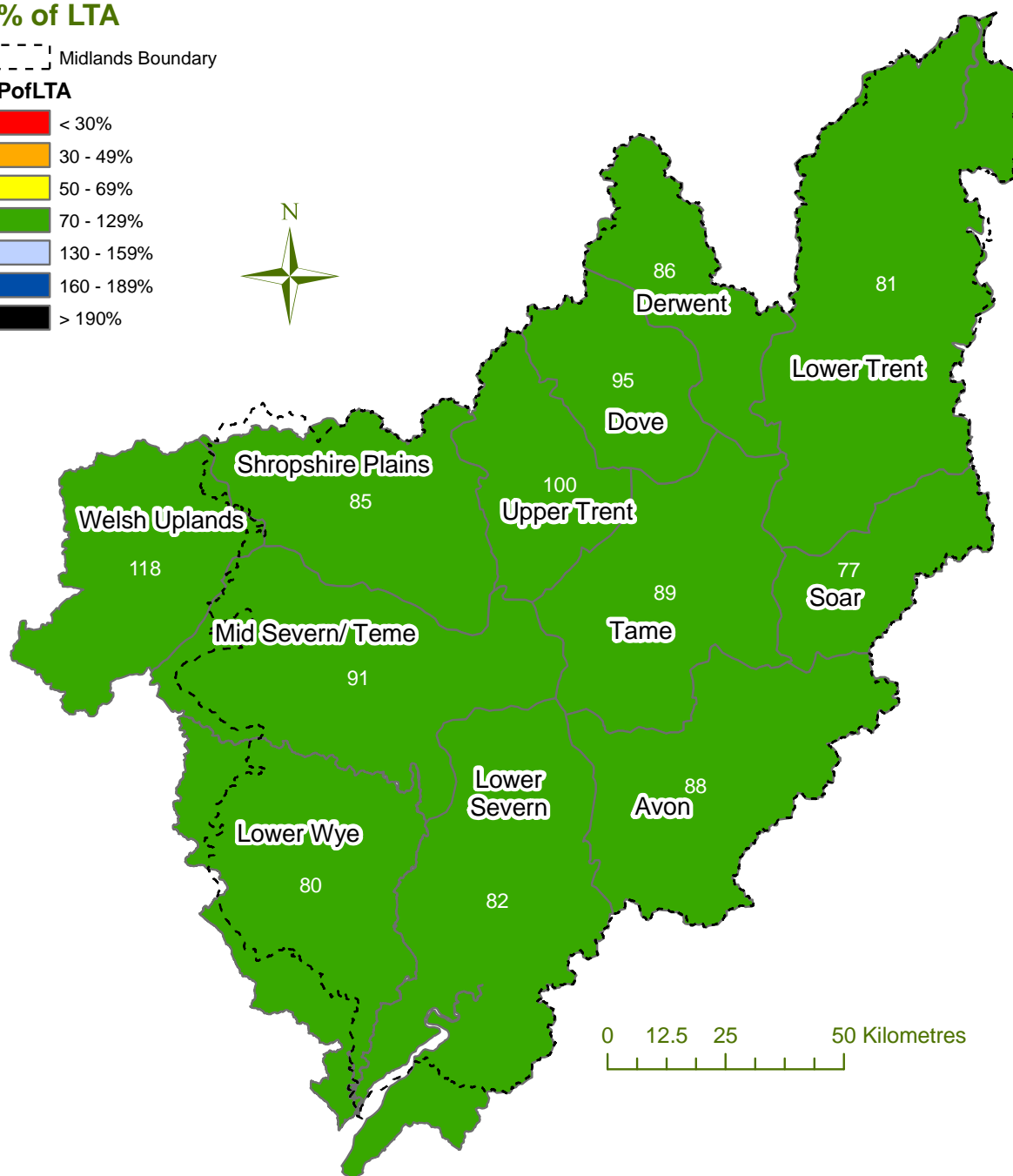
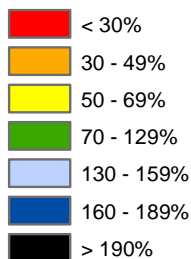


Figure 1. May average rainfall totals as a percentage of the 1961-1990 May long term average in 12 Environment Agency Hydrological areas across the Midlands Region, using provisional values from the National Climate Information Centre (NCIC). (Source: Met Office © Crown Copyright).

All data are provisional and may be subject to revision.


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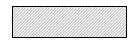
| Region/ Area | Total Rainfall (mm) | LTA mm (%) | Region/ Area | Total Rainfall (mm) | LTA (mm) |
|-------------------------|---------------------|-----------------|--------------|---------------------|----------|
| Midlands Region | 49.8 | 58 (86%) | Lower Severn | 47.6 | 58 |
| Midlands East | 44.7 | 54 (82%) | Upper Trent | 61.5 | 61 |
| Midlands Central | 54.1 | 58 (93%) | Tame | 49.8 | 56 |
| Midlands West | 50.3 | 59 (85%) | Dove | 63.4 | 67 |
| Welsh Uplands | 91.1 | 77 | Derwent | 58.6 | 68 |
| Shropshire Plains | 50.2 | 59 | Soar | 40.4 | 52 |
| Mid Severn/ Teme | 56.1 | 62 | Lower Trent | 41.2 | 51 |
| Avon | 47.4 | 54 | Lower Wye | 50.4 | 63 |

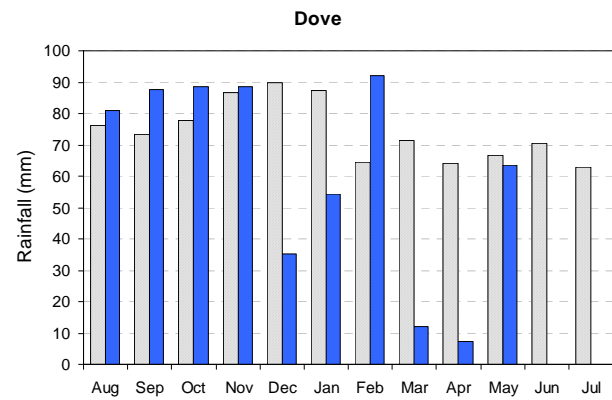
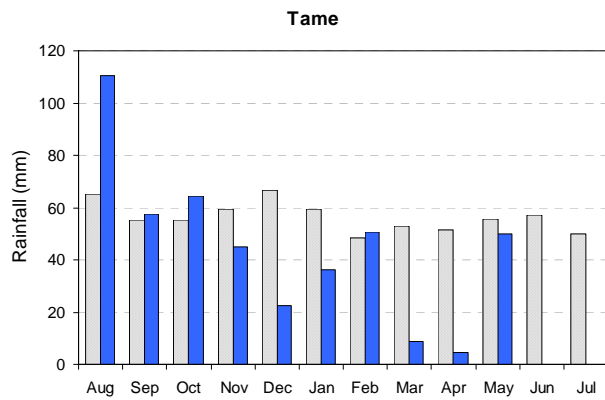
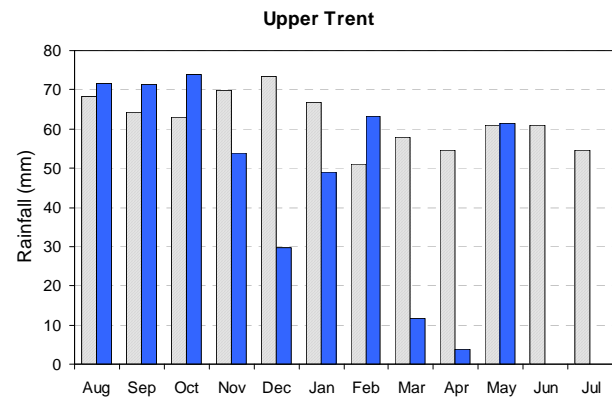
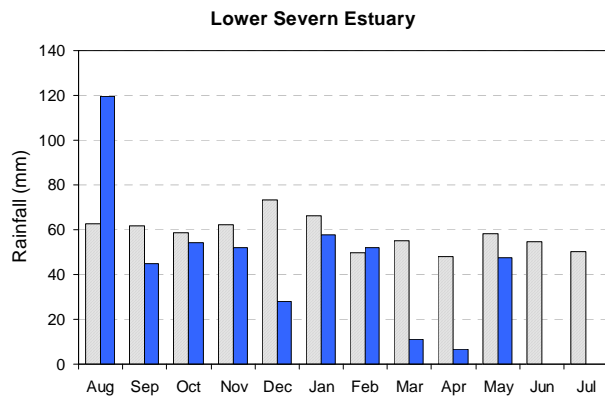
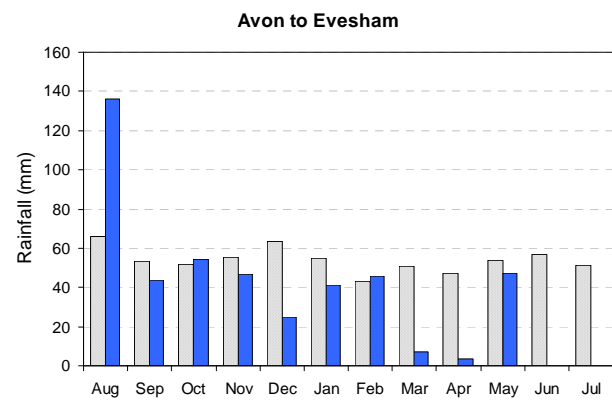
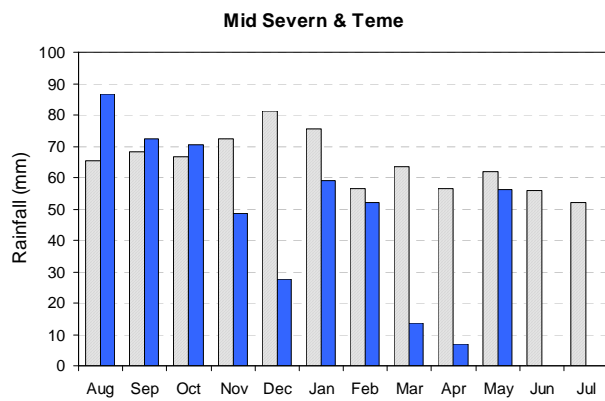
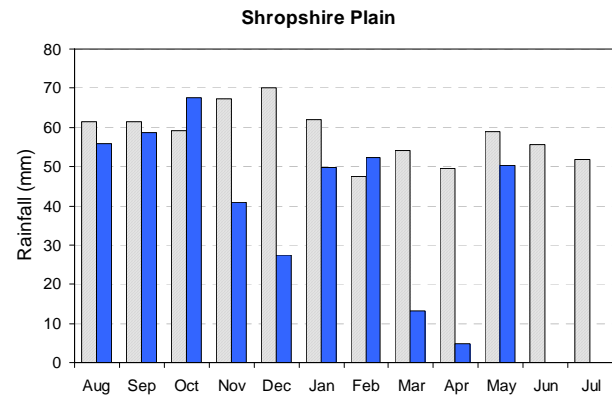
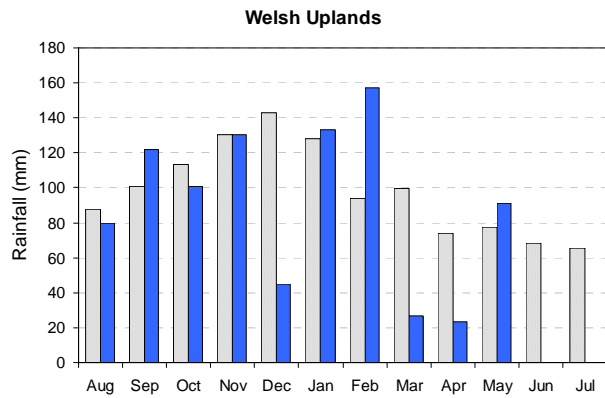
Table 3. May average rainfall totals and May LTA figures in 12 Environment Agency Hydrological areas across the Midlands Region, using provisional values from the National Climate Information Centre (NCIC) data. (Source: Met Office © Crown Copyright. All rights reserved. Environment Agency, 100026380, 2010).

Midlands Rainfall Totals Charts- 10 Month Time series

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 Monthly total rainfall (mm)

 Long-term average rainfall (mm)



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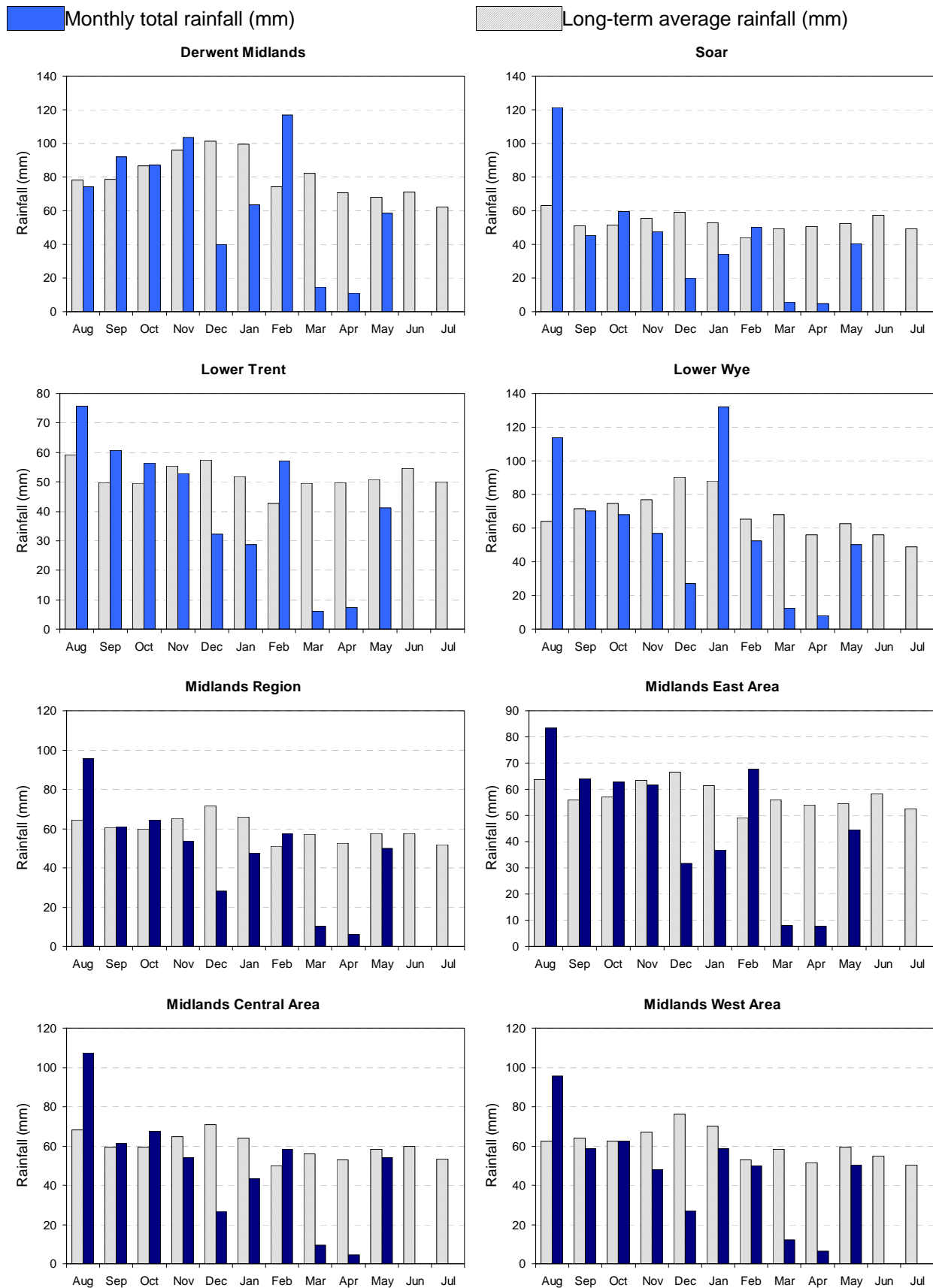


Figure 2: Monthly rainfall totals compared to 1961-1990 long term averages for hydrological areas in the Midlands Region, using provisional values from the National Climate Information Centre (NCIC). (Source: Met Office © Crown Copyright. All rights reserved. Environment Agency, 100026380, 2010).

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Soil Moisture Deficit Map for May 2011

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Key:

- _____ Midlands Regional Boundary
- - - Midlands Hydrological Boundary

Midlands Soil Moisture Deficit Map

SMD (Real land use in mm)
25 May 2011

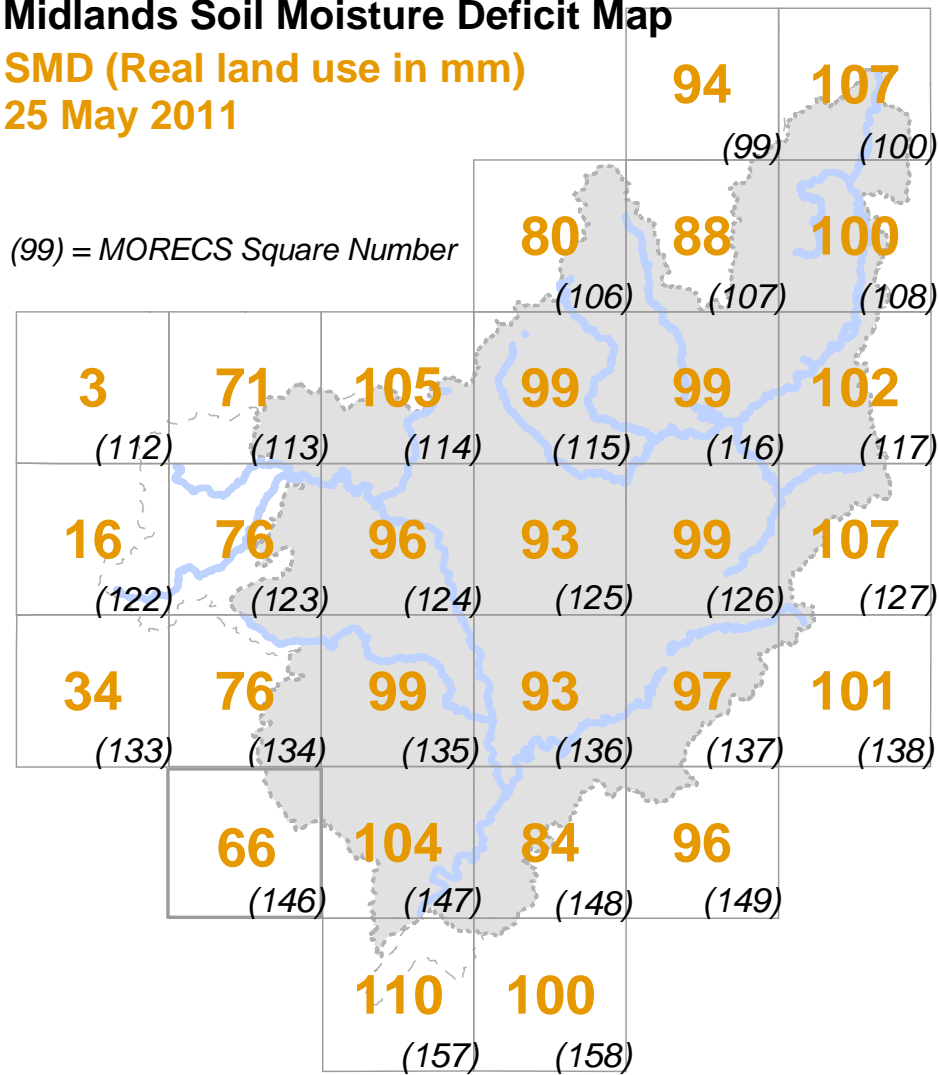


Figure 3: May soil moisture deficit maps for selected areas across the Midlands Region of England (Source: MORECS Dataset).

Midlands Soil Moisture Deficit Charts- 12 Month Time Series

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Key:

----- LTA

LTA

———— 2010/11

2010/11

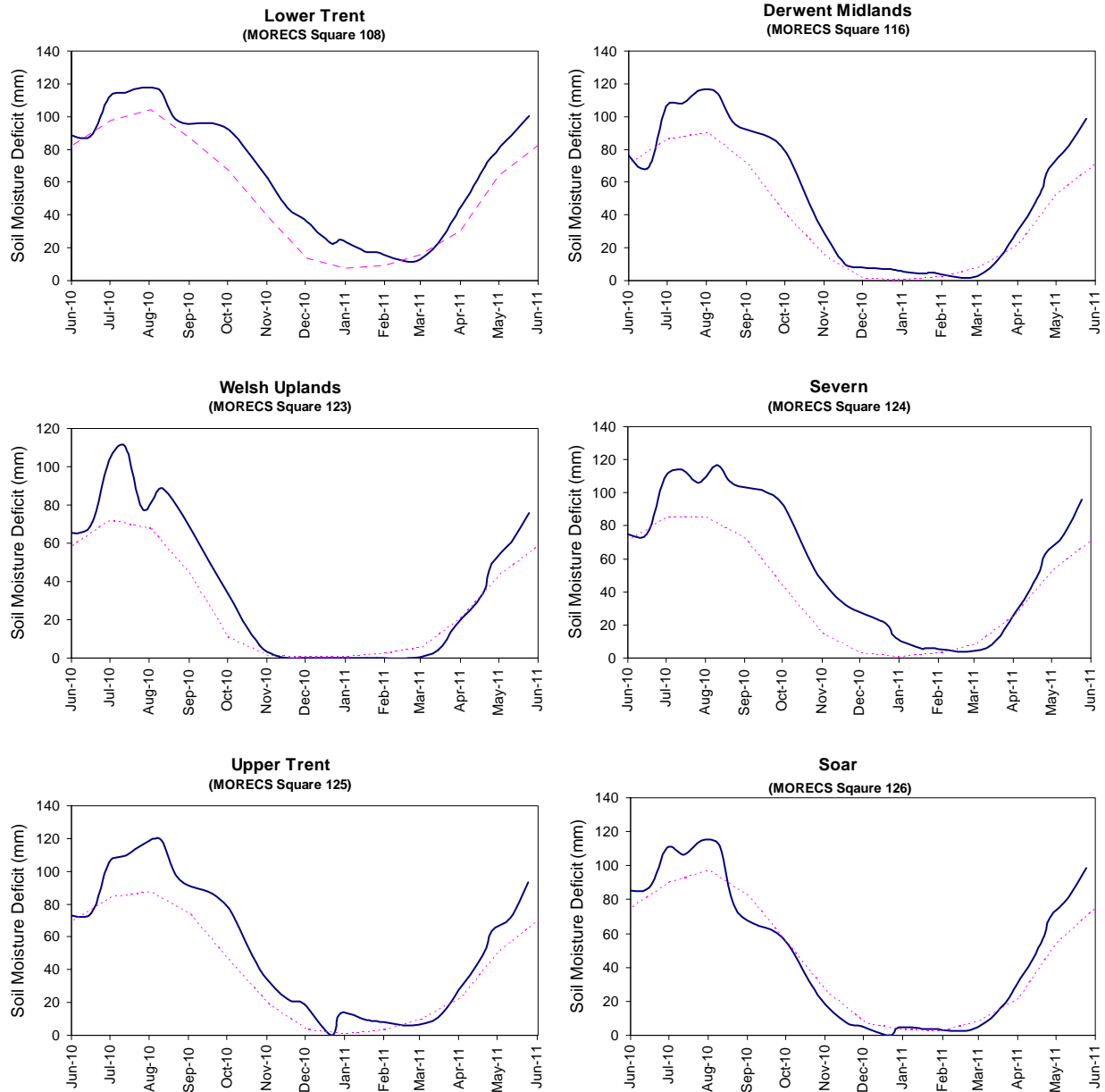


Figure 4: May soil moisture deficit charts for selected areas across the Midlands Region of England (Source: MORECS Dataset NFFS).

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Monthly Mean River Flows for May 2011

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% of LTA

River Flow Sites

Class

- Exceptionally high
- Notably high
- Above normal
- Normal
- Below normal
- Notably low
- Exceptionally low
- No data
- % of long term average

Midlands Hydrological Boundary

Midlands Region

River

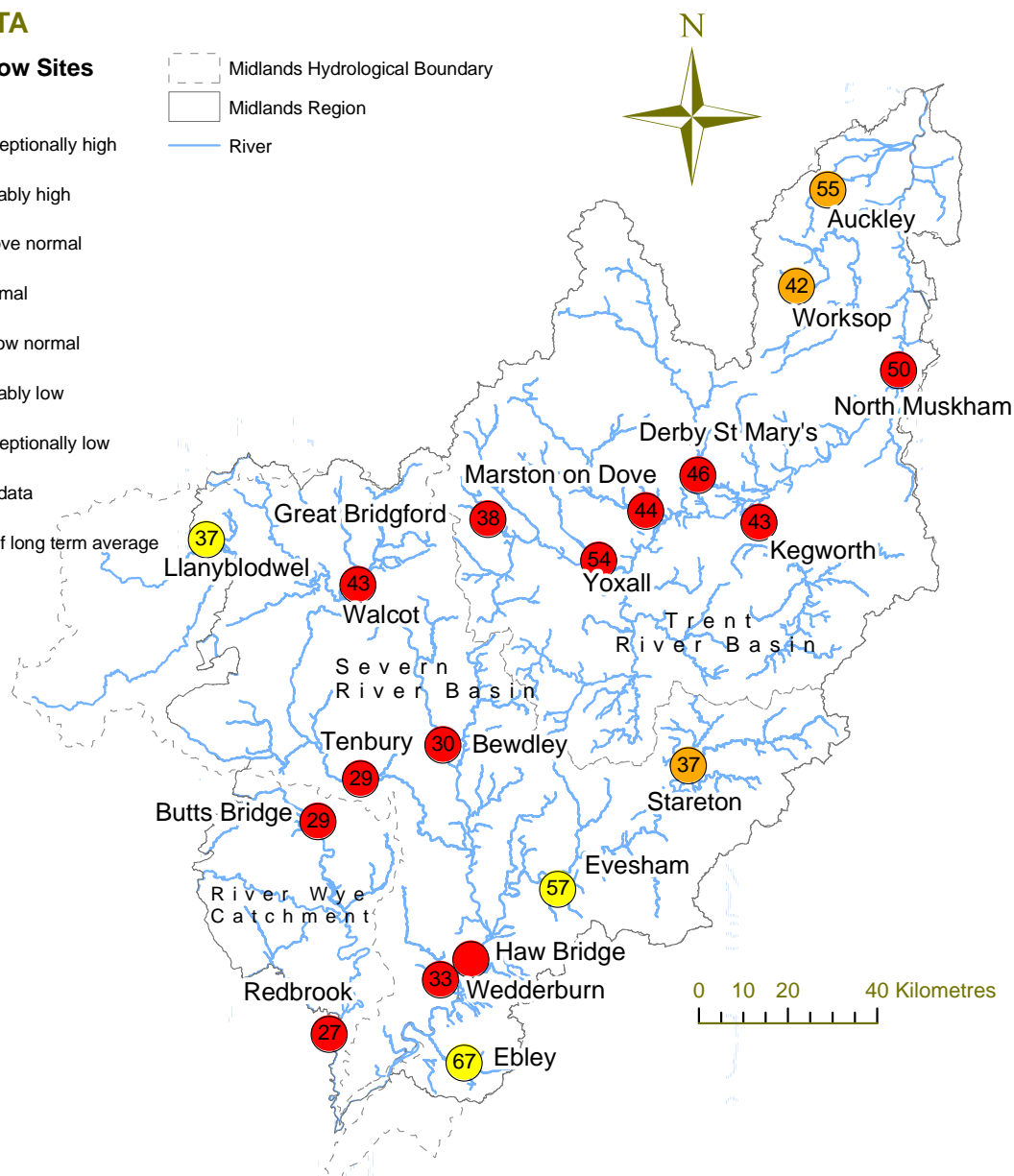
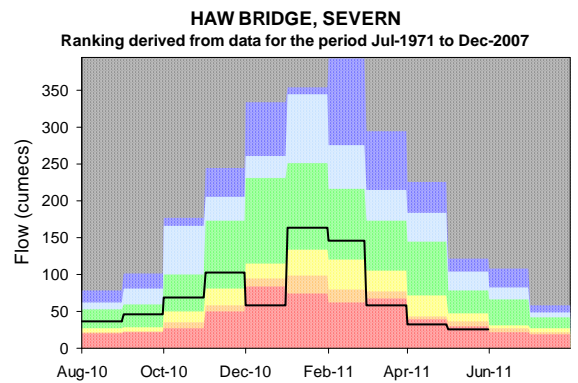
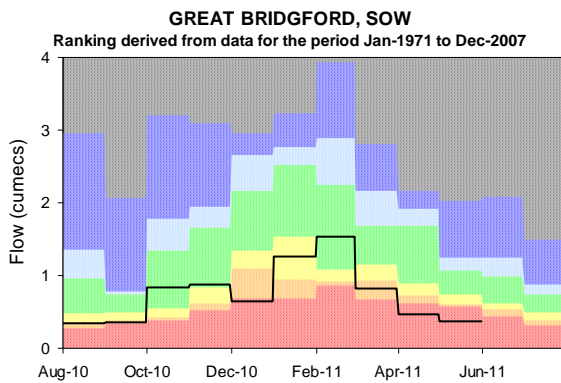
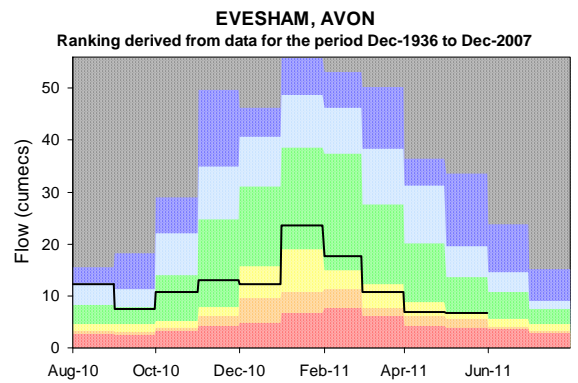
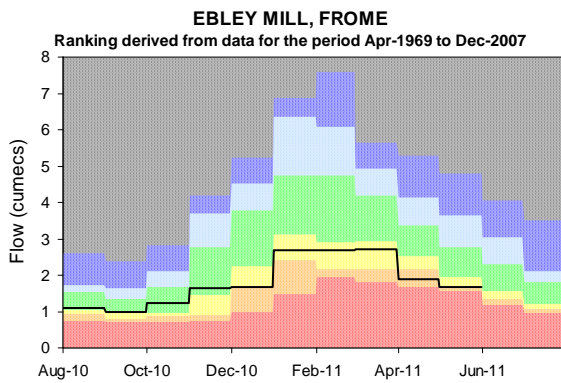
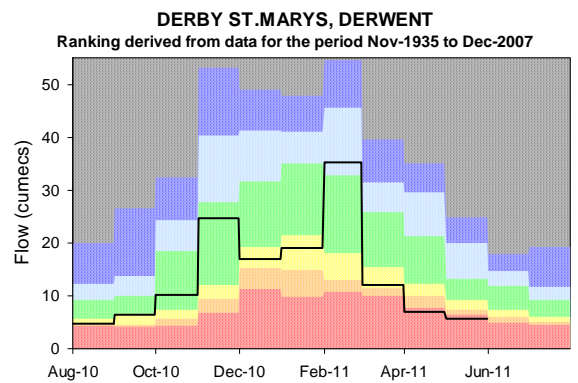
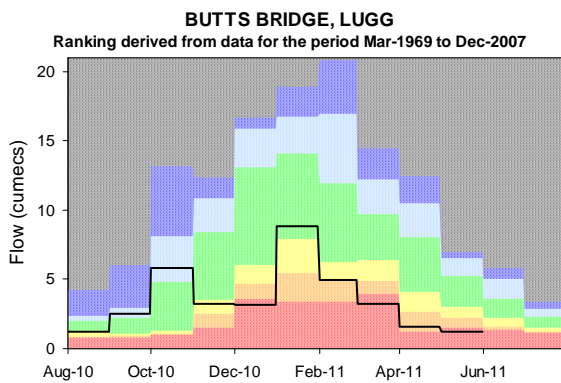
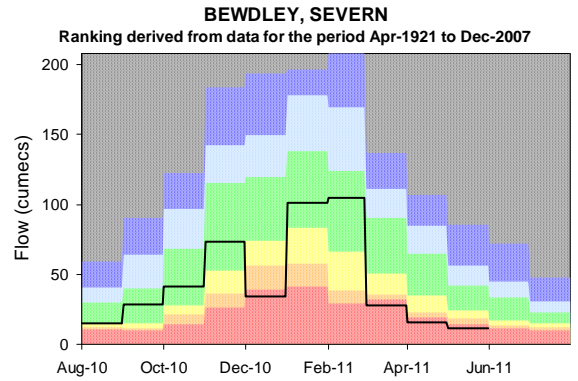
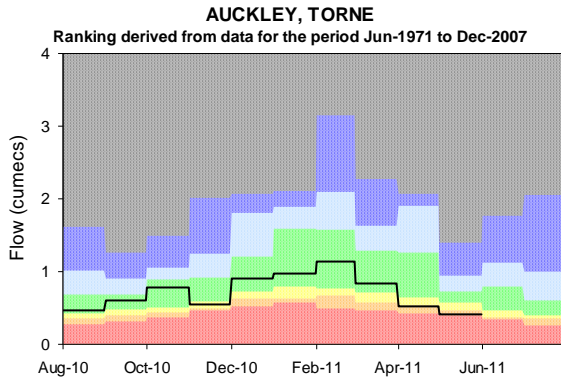
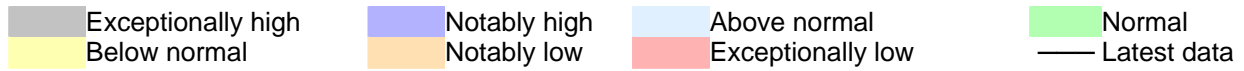


Figure 5. Monthly mean river flow for May 2011, classed relative to an analysis of historic May monthly mean flows for the same time of year. (© Crown Copyright. All rights reserved. Environment Agency, 100026380, 2010).

Note: Two flow monitoring site have been included in the Midlands Water Situation report to represent flows in the River Wye Catchment. Although 'Redbrook' falls just outside the Midlands boundary, the site will still be monitored in this report due to its Hydrological importance in the Lower Wye Catchment.

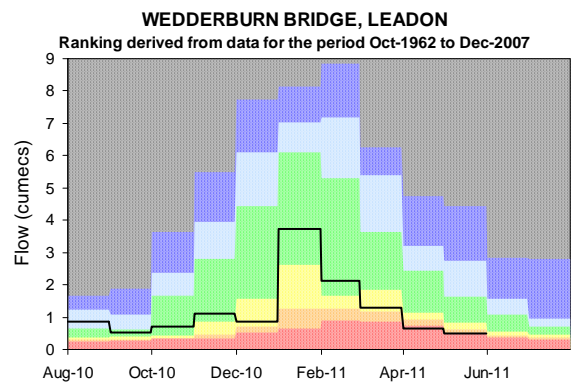
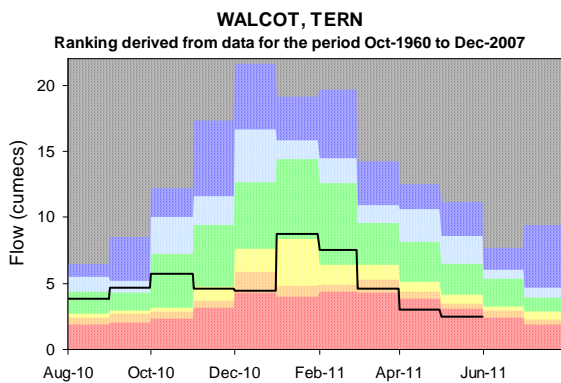
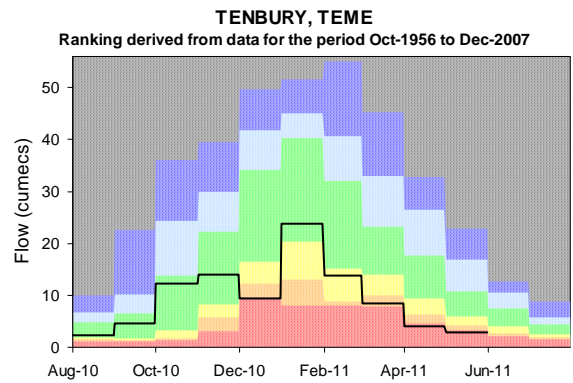
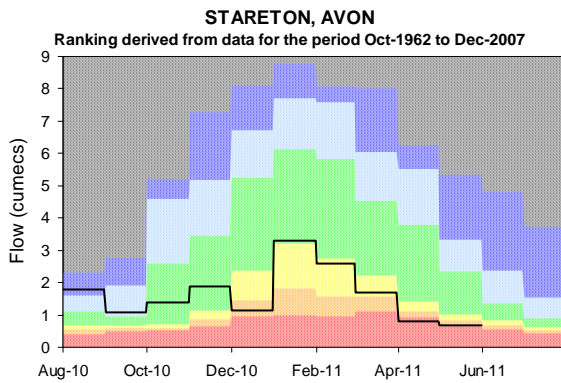
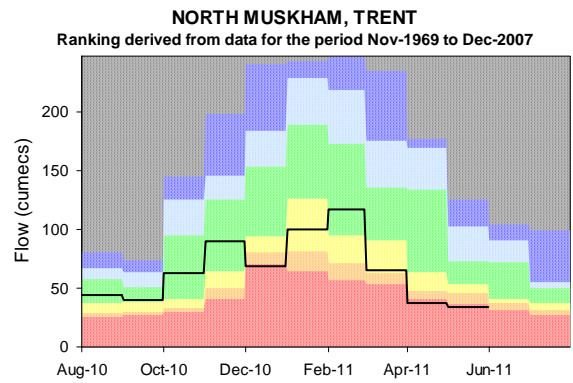
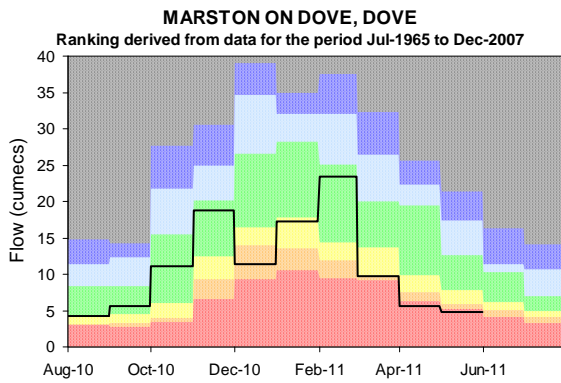
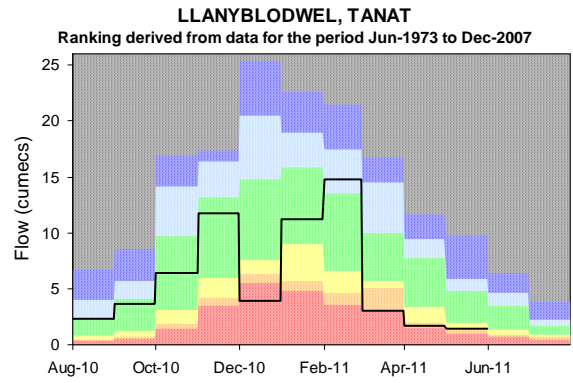
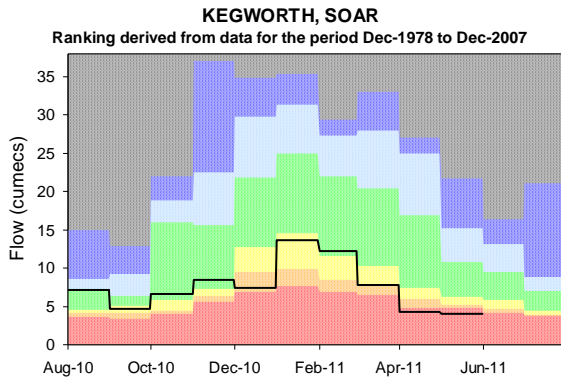
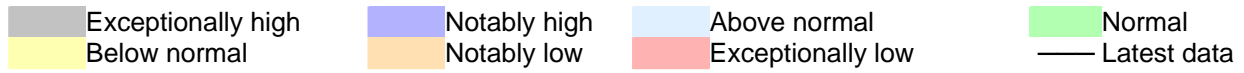
Midlands River Flow Charts- 10 Month Time Series

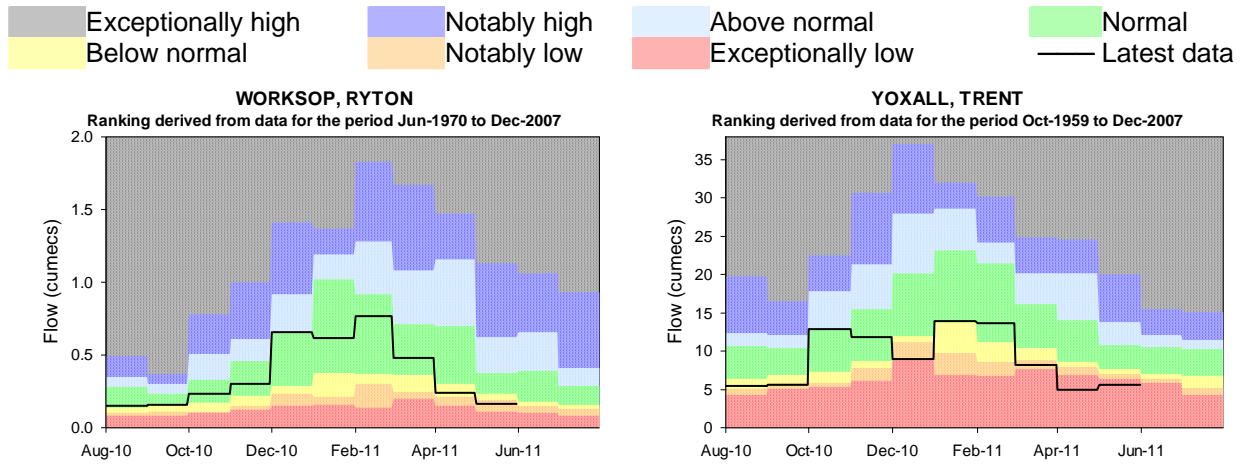
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EA Wales Region (reported due to Hydrological Importance)

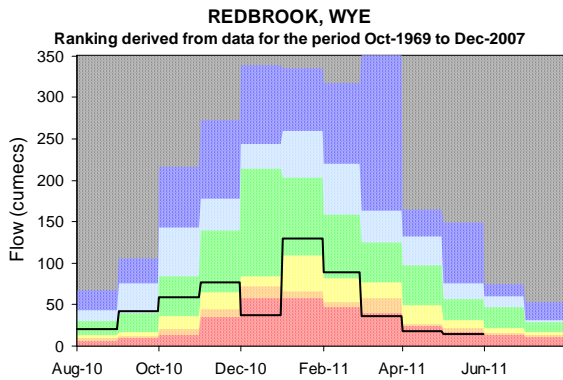


Figure 6: Monthly mean river flows for the past 10 months at selected gauging stations (Source: Environment Agency)

***Please note:** In order to make use of historic river flow data at each site; long term averages are based non standardised periods of record. As a result sites will not be comparable.

Monthly Mean Groundwater Levels for May 2011

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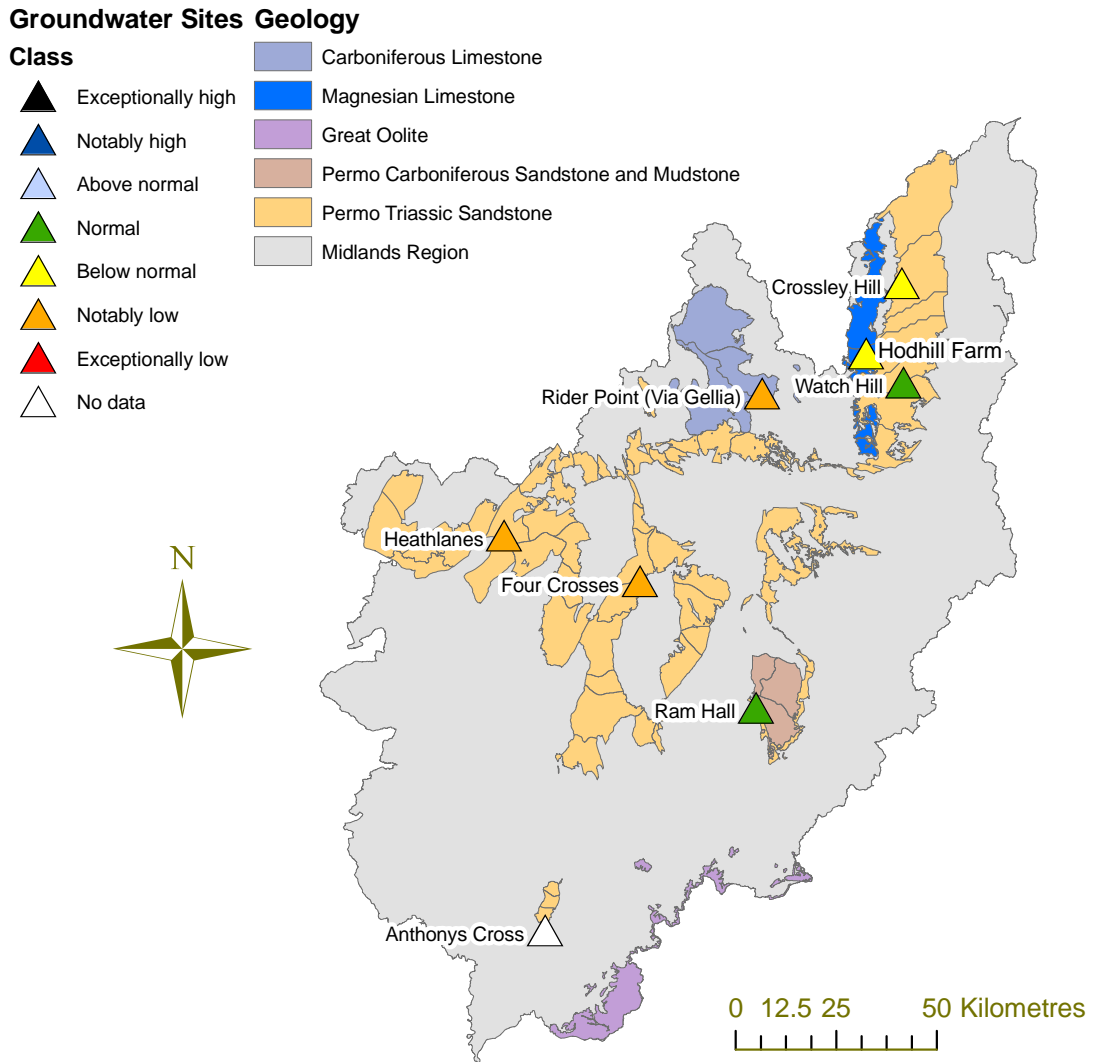
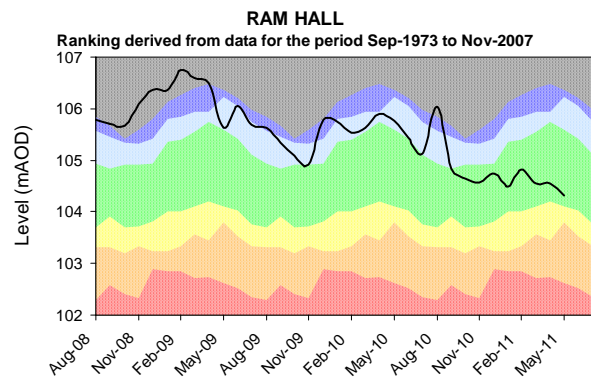
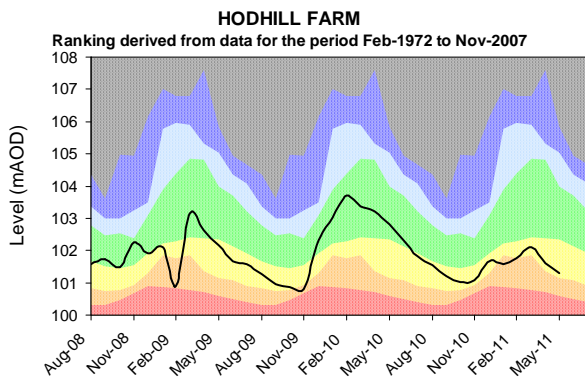
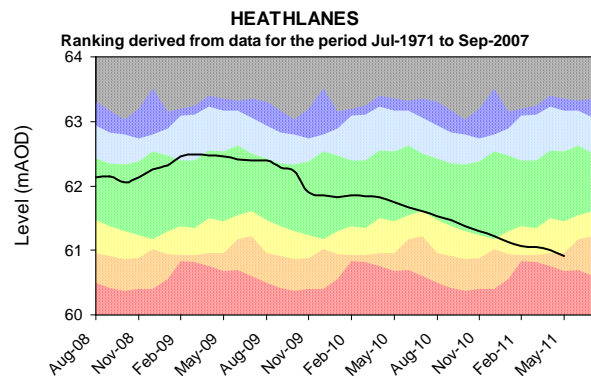
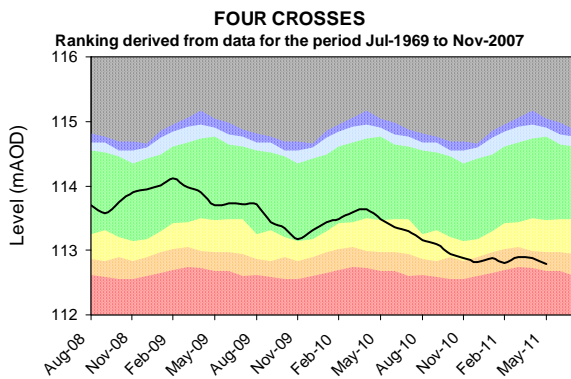
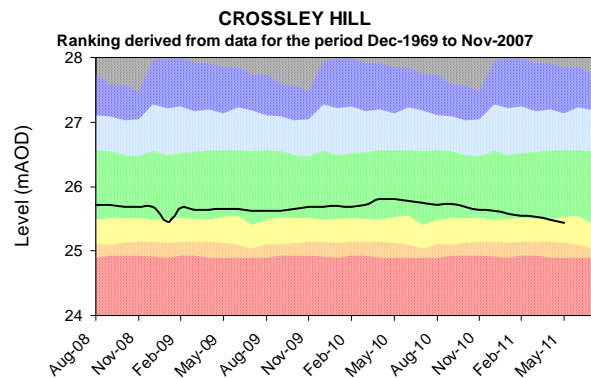
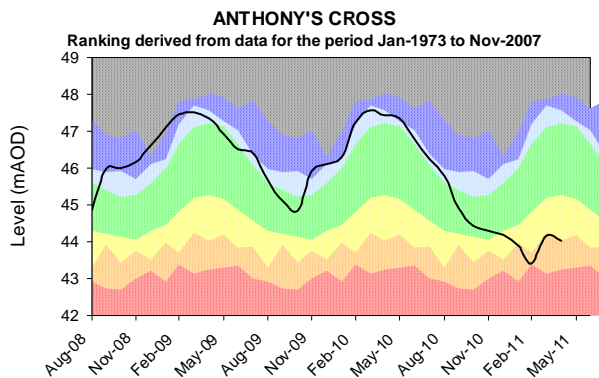
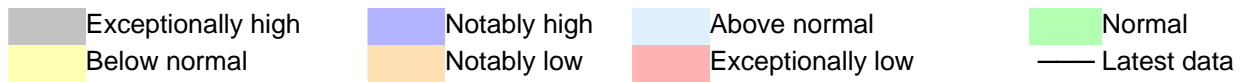


Figure 7: Groundwater levels at the end of May 2011, classed relative to an analysis of historic May groundwater levels. © Crown Copyright. All rights reserved. Environment Agency, 100026380, 2010.

Midlands Groundwater Charts- 34 Month time series

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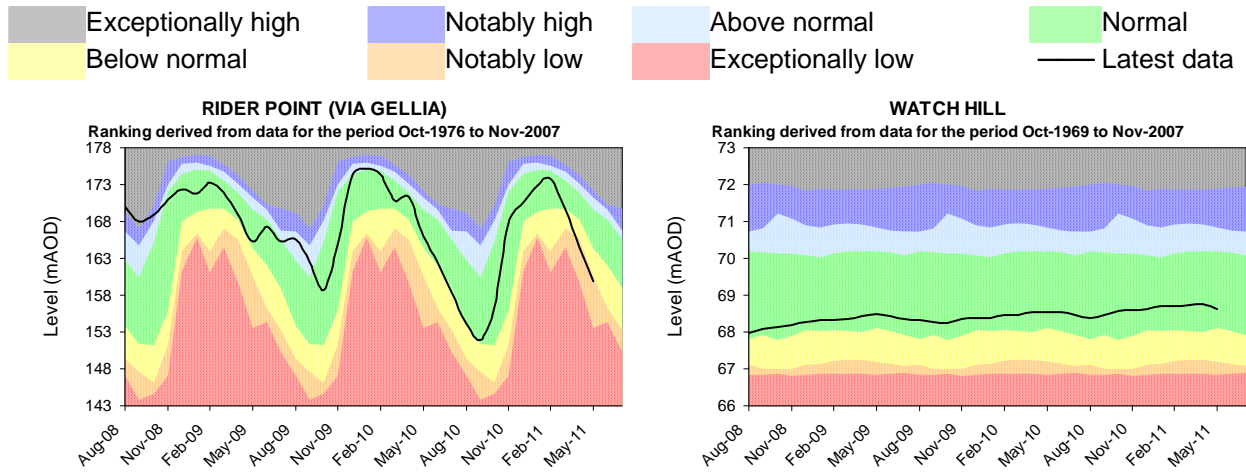


Figure 8: End Month Groundwater Levels over a 34 month time series at selected observation boreholes (Source: Environment Agency).

***Please note:** In order to make use of historic groundwater data at each site; long term averages are based non standardised periods of record. As a result sites will not be comparable.

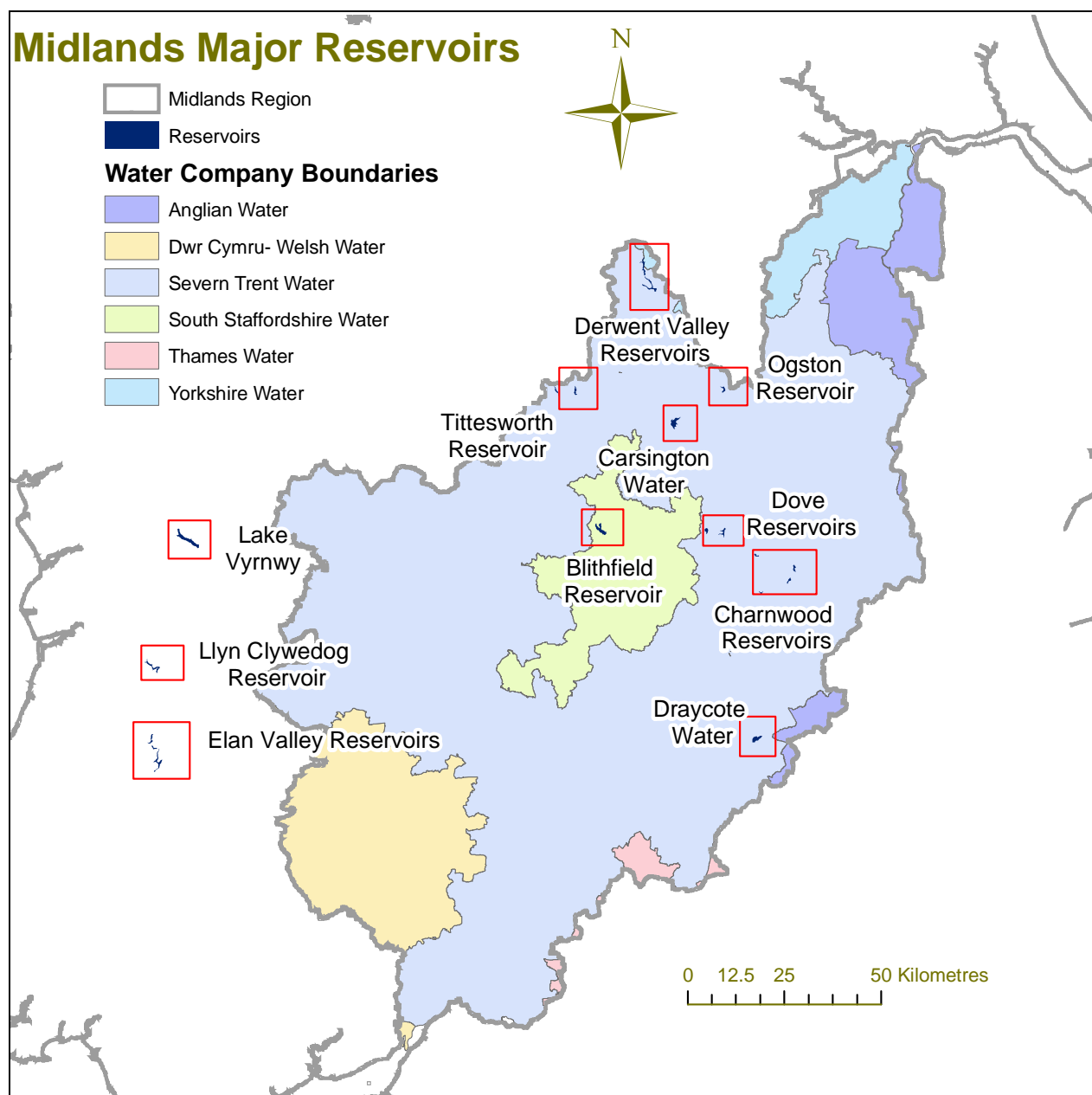


Figure 9: Geographical location of Major Reservoirs in the Midlands Region.
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Please Note: Lake Vyrnwy, Llyn Clywedog Reservoir and Elan Valley Reservoir are located in EA Wales Region. However, as they are Midlands water resources they remain in the Midlands Water Situation Report.

Midlands Reservoir Stocks- 30 Month Time Series

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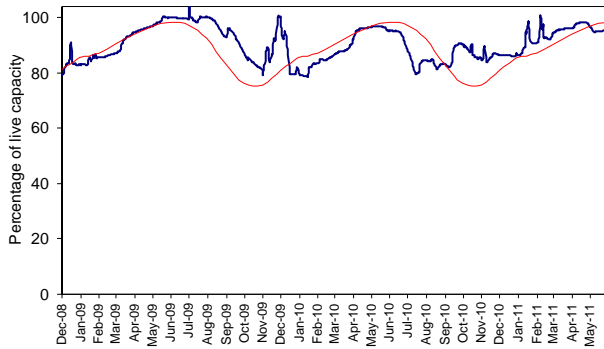


LTA

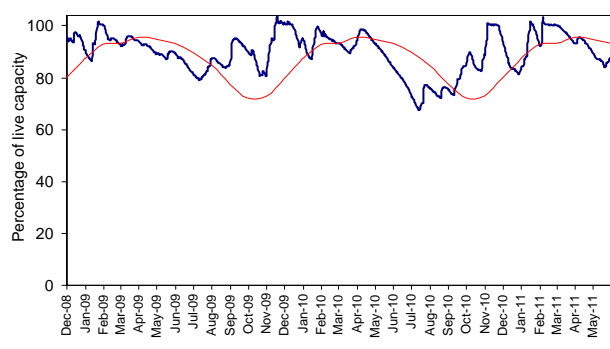


2009/11

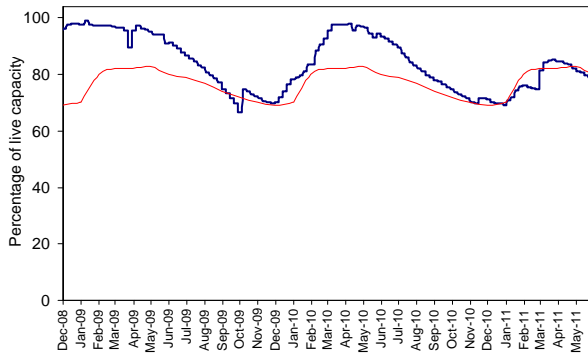
Llyn Clywedog



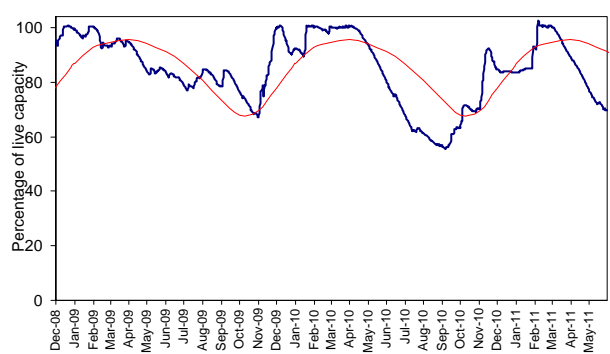
Vyrnwy Reservoir



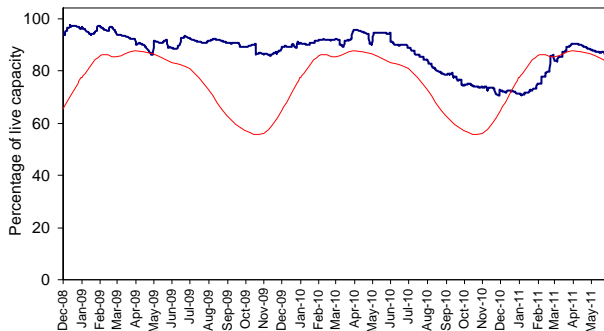
Draycote Water



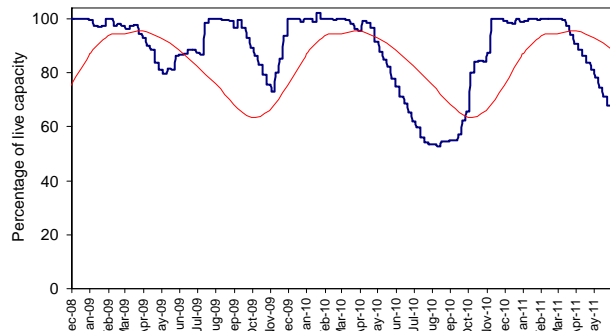
Derwent Valley Reservoirs



Ogston & Carsington Reservoir



Tittesworth Reservoir



All data are provisional and may be subject to revision.

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Midlands Reservoir Stocks- 30 Month Time Series

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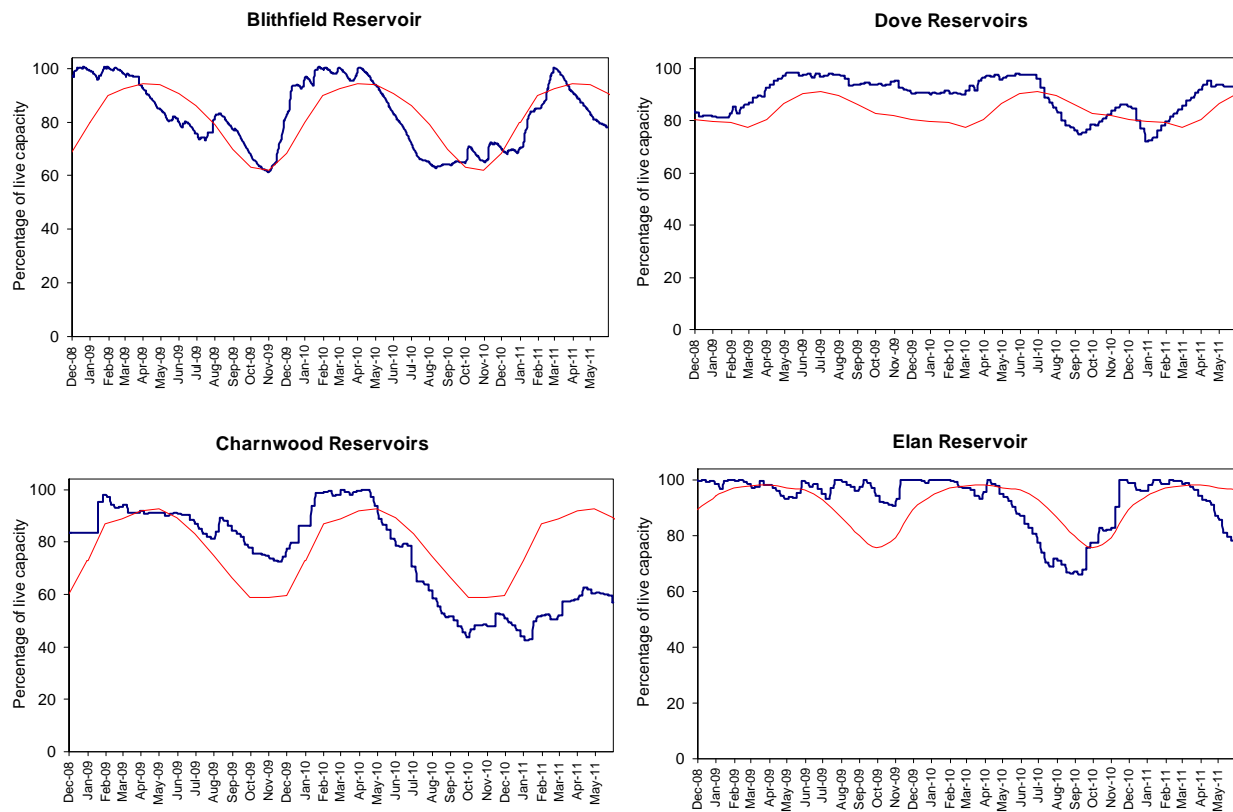


Figure 10: 30 month reservoir stocks (Source: Severn Trent Water Plc. & South Staffordshire Water Plc).

***Please note:** Long term averages are based on non standardised periods of record.

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 |
| 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). |