

## HEADLINE

**There is a MEDIUM risk of water scarcity in 2019 in the northeast region if winter recharge continues to be insufficient. The risk is lower elsewhere along the east of the country.**

### Situation summary

At the beginning of this winter SEPA issued an Early Warning for potential water scarcity in 2019 across much of the east of the country. Groundwater storage was low following the dry conditions of 2018 so sufficient winter recharge is crucial to avoid further impacts in 2019.

Dry conditions have continued into winter, however, with a significant rainfall deficit across Scotland compared to normal conditions. The northeast region, which was one of the hardest hit areas by the conditions in 2018, has been exceptionally dry in terms of winter rainfall.

This is reflected in groundwater levels (see the following charts) which, after a brief recharge in some areas, have begun to fall again. With limited time left to increase water storage (on average winter recharge means levels peak around the end of February) SEPA now considers that there is a Medium Risk that there will be further water scarcity in 2019 in the northeast, including Moray, Aberdeenshire and Angus. See below for an explanation of the assessed Water Scarcity Risk Level.

Winter recharge has still been limited elsewhere, although groundwater levels have been less affected through 2018. Therefore there is also a Low Risk across most of the eastern half of the country.

The three month forecast suggests normal to below-normal rainfall across the UK is most likely for the January-March period. For further details on the seasonal forecast see the latest report at <http://www.hydoutuk.net>.

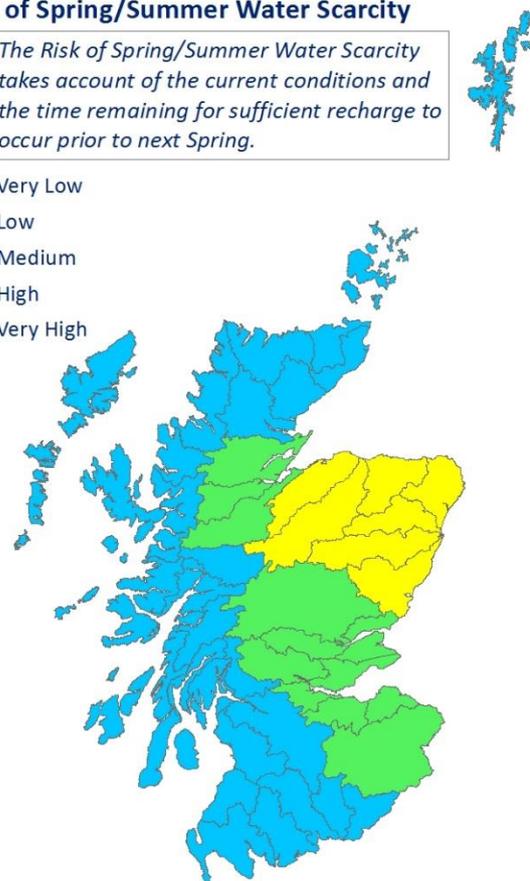
SEPA will continue to monitor the situation and update this report monthly. The report will be available on the [Water Scarcity section of SEPA's website](#).

Further details on the current situation are provided in the following figures:

### **Risk of Spring/Summer Water Scarcity**

 *The Risk of Spring/Summer Water Scarcity takes account of the current conditions and the time remaining for sufficient recharge to occur prior to next Spring.*

-  Very Low
-  Low
-  Medium
-  High
-  Very High



15/01/2019

## Precipitation Indices

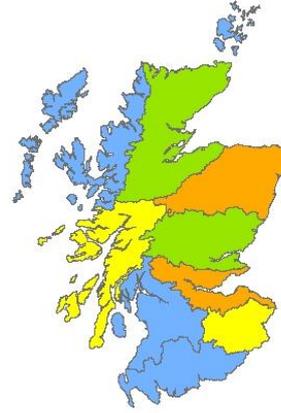
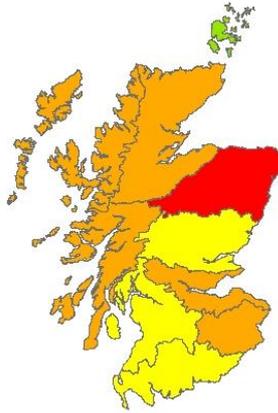
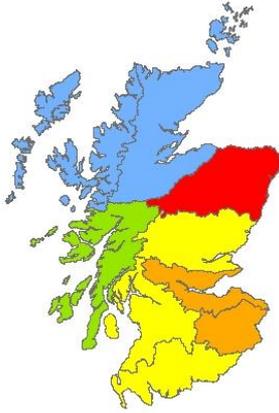
Rainfall over the  
past 30 days



Rainfall over the  
past 90 days



Rainfall over the  
past 180 days



*These maps show how low current rainfall totals are for this time of year, relative to historical averages, over the past 30, 90 and 180 days.*

- Normal Conditions
- Quite Dry
- Dry
- Very Dry
- Exceptionally Dry



## Natural water storage situation

In each river catchment there is some degree of water storage, which can maintain river flows even when it is not raining. This natural water storage is mainly held in lochs and groundwater. When natural storage has been depleted it will take a lot of rainfall for levels to recover.

Please note that the map below does not reflect conditions in managed water supply reservoirs.



### North East

Groundwater levels in the Northeast and Angus are still very low for the time of year compared to the long-term record (see the graphs below as an example). Winter recharge in November -December led to a rise in groundwater level but the recent lack of rainfall has resulted in levels falling once more. In Moray (see Feddan Junction), winter recharge has been very limited.

Loch levels in this area are also relatively low.

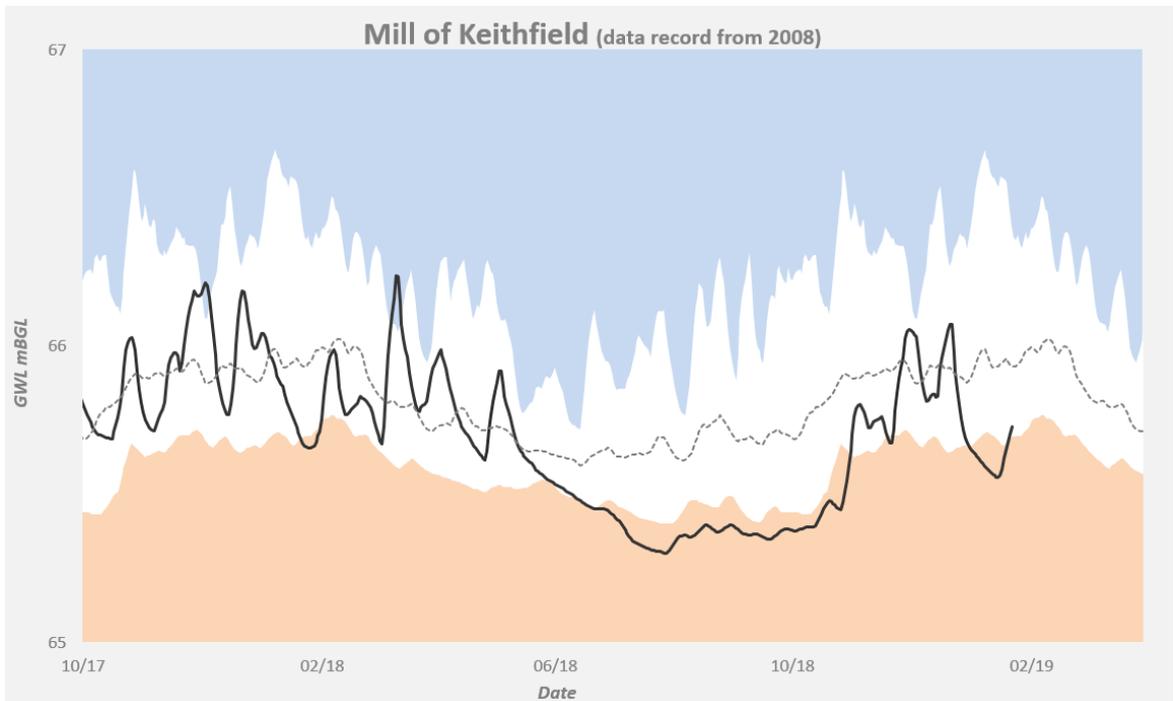
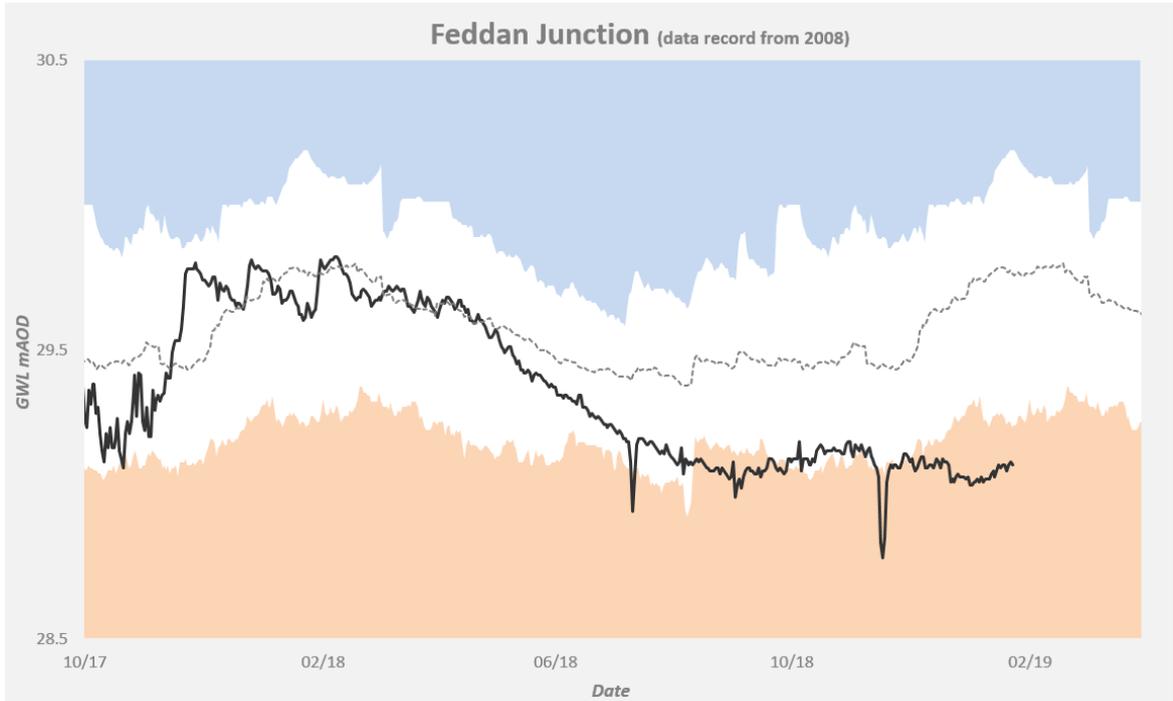
### South/South East

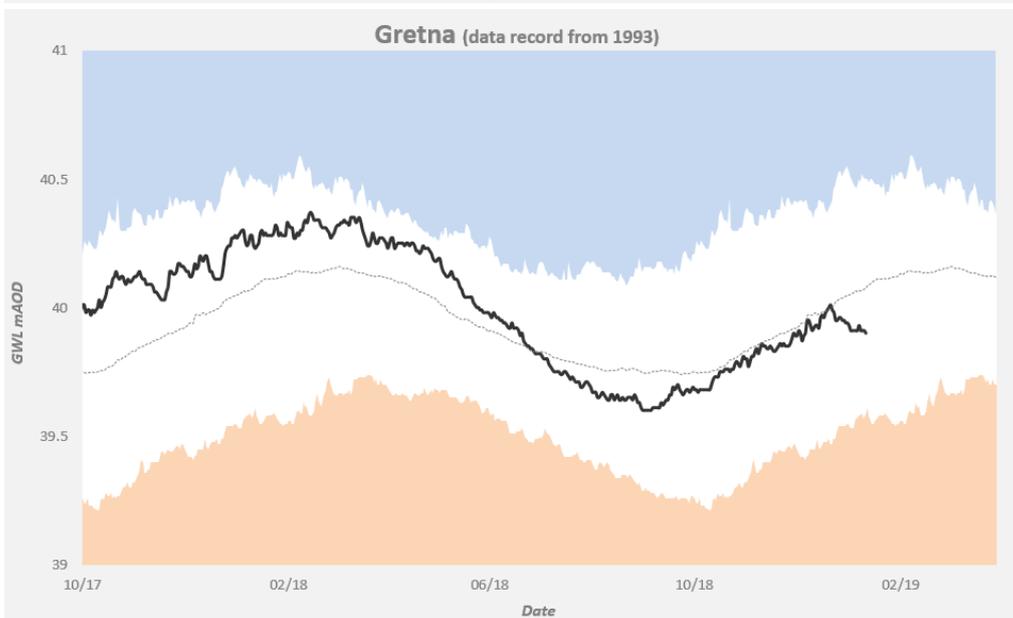
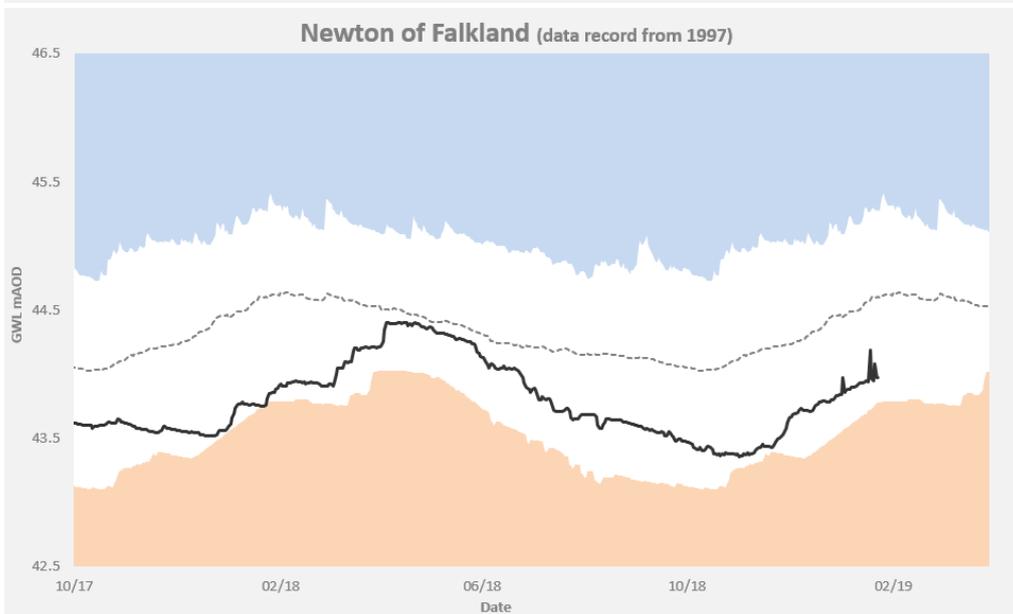
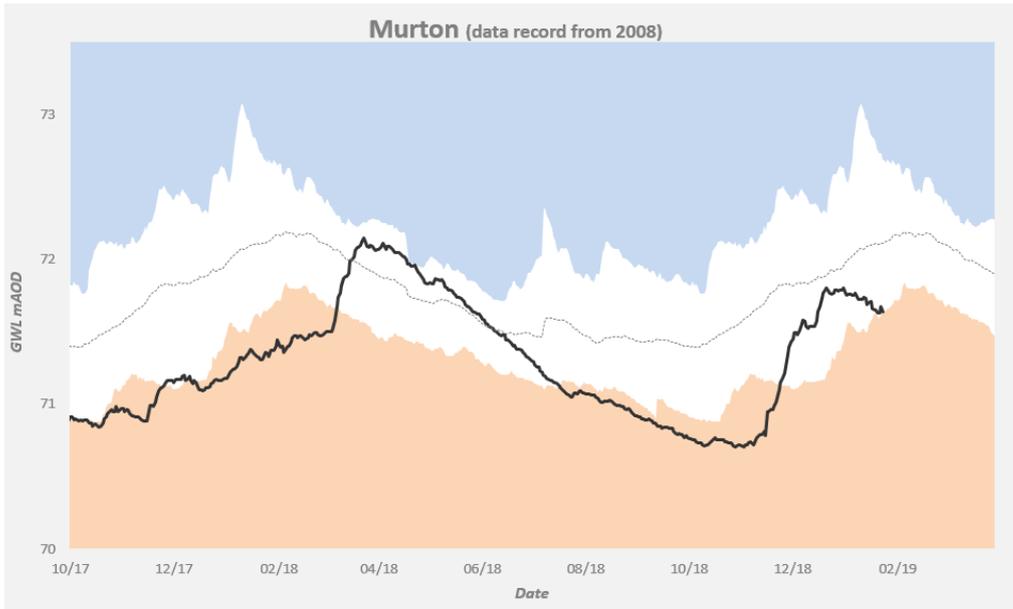
Further south, groundwater levels were less impacted through 2018, although still relatively low in places. However, winter recharge has been limited here as well, with levels at some sites falling again in January.



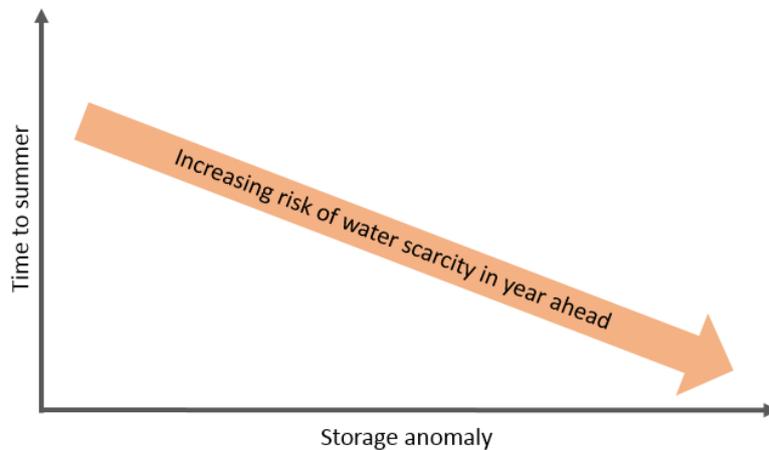
The following charts show the trend in groundwater levels since autumn 2017 at selected monitoring sites (see map above). The white zone represents the observed range in the long-term record. The black line shows the actual groundwater level and the dashed line is the long-term average trend.

Record high groundwater level
Normal groundwater level range
Record low groundwater level





## Water Scarcity Risk Level



*The risk of water scarcity in the year ahead is set considering both the current anomaly in water storage (groundwater and lochs) and the time left before the spring/summer period. Therefore this factors in both the amount of increased rainfall required to avoid impacts and accounts for the time remaining for such a wet period to occur and reduce the storage deficit.*

## Forecast conditions

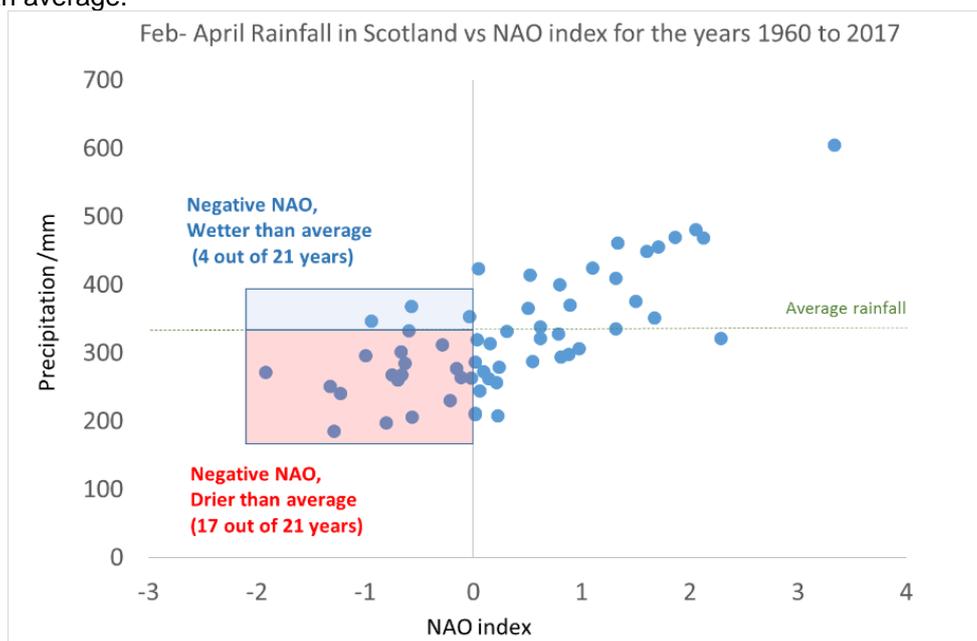
The current Met-Office 3-month outlook states that:

For both February and February-March-April overall, the Met Office long-range prediction system, alongside systems from other prediction centres, shows an increase in the likelihood of the negative phase of the North Atlantic Oscillation (NAO)

The rainfall forecast is mixed for the UK with an indication of wetter than average in the south and drier in the north. So what does this mean for the next 3 months in Scotland?

Looking at historic data, there is a relationship between NAO index and rainfall from February to April in Scotland with a negative NAO associated with drier than average conditions (see figure below).

In more than 80% of the years where the NAO has been negative, the Feb-Apr period has been drier than average.



Precipitation data from <http://www.metoffice.gov.uk/pub/data/weather/uk/climate/datasets/Rainfall/date/Scotland.txt>  
NAO data from <https://crudata.uea.ac.uk/cru/data/nao/>