Summary Assessment of 3-Monthly Seasonal Forecasts for UK during Nov, Dec and Jan - 2017-18

EuroTempest Summary Report – 3rd November 2017

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Executive Summary

This is a EuroTempest summary assessment of seasonal forecasts for the UK over the next 3 months.

Eight different Numerical Weather Prediction (NWP) model derived seasonal forecasts are compared. All NWP forecasts assessed are produced by UN World Meteorological Organization (WMO) designated global producing centers for long-range forecasts. The assessment also includes a summary of current climate signals for the UK.

Updated assessments will be issued twice more through the course of the autumn/winter: in early December and again in early January.

This summary assessment covers the next three months: November, December and January (NDJ) 2017-18.

UK NDJ 2017-18 PRECIPITATION OUTLOOK:

- There is some consistency across the seasonal forecast NWP models considered towards average or above average precipitation for the UK NDJ 2017-18.
- However, some current climate signals suggest that a drier than average period remains a distinct possibility.

UK NDJ 2017-18 TEMPERATURE OUTLOOK:

- There is consistency across the seasonal forecast NWP models considered towards average or above average temperature for the UK NDJ 2017-18.
- However, as with the precipitation outlook, some current climate signals suggest that a colder than average period remains a distinct possibility.

NOTES

- "NDJ 2017-18" is defined as November 2017-January 2018 inclusive.
- This is not a EuroTempest forecast. This is a EuroTempest summary of a number of World Meteorological Organization (WMO) designated global producing centers for long-range forecasts. (http://www.wmo.int/pages/prog/wcp/wcasp/gpc/gpc.php)
- The brief summary of the possible climate signals during NDJ 2017-18, gives some indications of possible weather patterns. However, these signals only give some suggestions and are not as detailed or refined as the WMO centers forecasts.
- There is little tendency for one type of weather to prevail over any three month period and this assessment does not dismiss the possible occurrence of other weather types over shorter time periods during the winter.
- Seasonal forecasts are for average conditions over a period (November 2017 to January 2018 inclusive). They are not forecasts for weather conditions persisting throughout the whole of the period.
- This report is an early indication of conditions over winter 2017-18 and will be updated through the season.
- This report is produced for information only. Please contact us if you require further information or have any feedback. Contact details are provided in the "Contacts" section below.

Seasonal Forecast Assessment - Method

In order to have any confidence in whether any season will likely turn out as forecast (by any agency) it is necessary to consider:

a. whether there is a strong indication in any given forecast towards conditions for the coming season which are different from what might be expected from an average season based on the long term historical record
b. consistency across a range of available forecasts

In assessing the outlook for the UK NDJ 2017-18 EuroTempest has taken account of forecasts produced by WMO designated global producing centers for long-range forecasts, these are either National Meteorological Agencies or other meteorological centres. These centres are listed in the "Seasonal Forecast Assessment – Sources" section below.

EuroTempest has chosen to focus on precipitation and temperature forecasts as all eight agencies produce forecasts for both of these parameters, enabling a comparison across all agencies. Unlike currently available seasonal forecasts for e.g. Atlantic hurricane numbers, no agency currently produces seasonal forecasts for the number of UK winter windstorms.

No two agencies present their forecasts in exactly the same way. Some present forecasts in terms of probabilities – e.g. the probabilities of the upcoming NDJ period being in the top third (above average), middle third (average) or bottom third (below average) of historical NDJ periods in terms of observed mean precipitation or temperature. Agencies that use this method have probabilities, expressed as percentages, given next to their forecasts within the forecast summary table.

Other agencies present forecasts in terms of anomalies - i.e. the expected difference in the mean precipitation or temperature over the coming season from what would be expected from an average NDJ periods based on the historical record. Forecast using this method are generally either stated as being above or below the average. For agencies that use this method only the forecasts (i.e. above or below average) are given within the forecast summary table.

Also, the resolution of the forecasts (both spatial and in terms of the forecast parameter) differs between agencies. As such, absolute direct comparisons are not possible. EuroTempest has assessed each of the forecasts and summarised its conclusions in the results table below. The entries in the table below represent EuroTempest's standardised interpretation (applied to the UK) of the forecasts provided by each agency and do not necessarily represent a specific forecast for the UK by each agency.

It is also important to note that all agencies advise treating seasonal forecasts with caution – e.g. the UKMO seasonal forecast website states "Raw data are displayed for use by international meteorological centres. This does not constitute a seasonal forecast for a given location."

SUMMARY OF CURRENT 3-MONTH SEASONAL MODELLED FORECASTS FOR THE UK (NOVEMBER 2017-JANUARY 2018 inclusive)

	FORECAST PARAMETER		
FORECAST AGENCY	*PRECIPITATION*		*TEMPERATURE*
UKMO	Above average (40%)		Above average (60%)
CFS	Around average		Above average
JAMSTEC	Below average		Above average
CPTEC	Above or Around average		Above average
Météo France	Above average (50%)		Above average (50%)
SAWS	Above average		Above average
KMA	Above average (50%)		Above average (70%)
APCC	Above average (40%)		Above average (60%)

Percentages in brackets represent the approximate probability of the outcome described (if available)

There is an indication of some consistency in these seasonal forecast models towards average or above average precipitation for the coming 3 months in the UK, although one agency (JAMSTEC) does suggest that drier than average conditions are more likely. The Météo France and KMA models suggest a 50% chance of above average precipitation during the next 3 months while the UKMO and APCC models suggest a 40% chance of an above average 3 months (with a 30% chance each of an around or below average 3 months). The probability of above average precipitation should be considered against the "climatological" chance of an above average period. This is 1 in 3, or around 33%, because any outlook will be in either the top third (above average), middle third (average), or bottom third (below average). Also, a 40% probability of above average precipitation, for example, means that the probability that the 3 month period will *not* be above average (i.e. will be around or below) is in fact greater, at 60%. Generally speaking, the current numerical weather prediction model forecasts indicate that the chance of an average to above average 3 months in terms of precipitation well outweighs the chance of a relatively dry three months.

There is also consistency in these seasonal forecasts models towards average or above average UK temperatures over next 3 months, with all the agencies favouring warmer than average conditions. The estimated probability of above average temperatures (where given) ranges from 50% (Météo France) to as high as 70% (KMA) and is given as 60% by both UKMO and APCC. The general indication from all the above forecasts is that a colder than average UK NDJ period is much less likely than an average or warm NDJ period. However, it should be noted that these agencies generally define "average" conditions as the mean of the last 30 years or so. The generally increasing trend of warmer conditions as a result of climate change makes it more likely that temperatures will exceed these historical averages. Therefore, temperatures this NDJ period that are colder than those that the UK has experienced within the last few years could still be above "average" by this definition.

Seasonal Forecast Assessment – Possible climate signals for the UK NDJ 2017-18

There are a number of often competing climate factors that can influence the weather in the UK during late autumn/early winter. Relationships between UK weather and these factors are generally not strong enough for them to be a basis for skilful, definitive forecasts but they can sometimes be suggestive of which weather types may be more likely to prevail.

Notable influences include the sea surface temperature (SST) in the North Atlantic. This is currently above average except in the area just to the west of the UK where it is slightly below average. However, warmer sub-surface waters in this colder region are expected to rise and increasingly influence the surface temperature as the 3 month period progresses. Altogether this suggests a tendency towards a higher likelihood of a warmer and wetter period in the UK.

Conversely, Eurasian snow cover is above normal at the moment and Arctic sea ice extent is well below normal. High Eurasian snow cover and low Arctic sea ice together tend to produce more favourable conditions for a strengthening Siberian high in winter. Such a weather pattern tends to increase the likelihood of a colder and drier period in the UK.

The North Atlantic Oscillation (NAO) and Arctic Oscillation (AO) are large scale variations in the pressure pattern across the North Atlantic and Arctic respectively. Negative phases of the NAO and AO are associated with below average precipitation and temperature for the UK and Europe at this time of year. Various global climate signals have been linked to potential upcoming European weather via an association with the different phases of the NAO and AO.

A strong stratospheric polar vortex (SPV), for example, is often associated with a positive AO. The SPV is currently of average to greater than average strength, so is in a phase that tends to be associated with wetter and warmer UK weather than average. However, the Quasi-Biennial Oscillation (QBO), a regular oscillation of the equatorial winds in the stratosphere, has recently entered an easterly phase and this phase is likely to continue throughout the NDJ period. The easterly phase of the QBO tends to work towards decreasing the strength of the SPV. This suggests the possibility of drier and colder than average conditions developing through the period as the SPV and AO weaken over time. Likewise, the Madden-Julian oscillation (MJO), a pattern of thunderstorm activity in tropical regions, is also currently in a phase that favours a negative NAO and AO and thus colder, drier weather in the UK.

While the effects of ENSO (the El Niño Southern Oscillation) are relatively well defined in some parts of the world (it is a Pacific Ocean phenomena) they are less substantial in Europe, though there is some suggestion that La Niña may be linked to a negative NAO phase during early winter in the northern hemisphere. ENSO is currently in a slightly negative phase but not so negative as to meet the criteria for a defined La Niña event. There is currently a ~55-65% chance that a low-intensity La Niña event will develop during the next few months.

In summary, current climate signals do not provide a strong indication of likely weather for the next three months as arguably two of the most influential signals (North Atlantic SST and Eurasian snow and Arctic sea ice cover) are pointing towards contradictory outcomes. However, while the other signals do have shorter term and/or a weaker influences on UK weather on a seasonal timescale, each one is currently in a phase associated with a tendency towards drier and colder UK weather. Altogether, current climate signals suggest that a colder/drier than average period remains a distinct possibility, if not an outright likelihood.

Summary

While a case can be made for colder and drier than average conditions for the UK over the November, December, January 2017-18 period, and though colder and drier than average conditions cannot be precluded, the evidence as a whole suggests that a period of average or above average precipitation and temperature is the more likely outcome.

Future Seasonal Forecast Assessments

The next 3-monthly seasonal forecast assessment will be issued at the beginning of December and will cover the period December, January and February 2017-2018.

A further 3-monthly seasonal forecast assessment will be issued at the beginning of January and cover the period January, February and March 2017-2018.

Seasonal Forecast Assessment - Sources

In assessing the outlook for the UK NDJ 2017-18 EuroTempest has taken account of forecasts produced by eight agencies in October 2017. These are either National Meteorological Agencies or other meteorological organisations. All eight of these agencies/organisations are World Meteorological Organization (WMO) designated global producing centres for long-range forecasts.
(http://www.wmo.int/pages/prog/wcp/wcasp/gpc/gpc.php)

UK Met Office (UKMO)
http://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/glob-seas-prob

The US National Centers for Environmental Prediction Climate Forecast System (CFS)
http://www.cpc.ncep.noaa.gov/products/people/wwang/cfsv2fcst/

Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
http://www.jamstec.go.jp/frcgc/research/d1/iod/e/seasonal/outlook.html

Center for Weather Forecasts and Climate Studies (CPTEC) - Brazil
http://clima1.cptec.inpe.br/gpc/pt

Météo-France
http://www.meteofrance.com/accueil/previsions-saisonnieres

South African Weather Services (SAWS)
http://www.weathersa.co.za/component/content/article/2-uncategorised/179-long-range-forecast?Itemid=168

Korea Meteorological Administration (KMA)
http://www.wmolc.org/~GPC_Seoul/

APEC Climate Center (APCC) – South Korea
http://www.apcc21.net/ser/outlook.do?lang=en

Contact

For further information on this Summary Assessment of 3-Monthly Seasonal Forecasts for the UK during Nov, Dec and Jan 2017-18 or more information on EuroTempest's products and services please contact us at any of the addresses below.

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