Summary Assessment of 3-Monthly Seasonal Forecasts

for

UK during Dec, Jan and Feb - 2017-18

EuroTempest Summary Report – 1st December 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 once more this winter, in early January.

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

UK DJF 2017-18 PRECIPITATION OUTLOOK:
- There is some consistency across the seasonal forecast NWP models considered towards average or above average precipitation for the UK DJF 2017-18.
- The current climate signals suggest the likelihood of a drier than average December followed by wetter conditions during the beginning of next year.

UK DJF 2017-18 TEMPERATURE OUTLOOK:
- There is consistency across the seasonal forecast NWP models considered towards average or above average temperature for the UK DJF 2017-18.
- Similar to the precipitation outlook, the current climate signals suggest the likelihood of a colder than average December shifting to milder conditions during Jan and Feb.

NOTES
- "DJF 2017-18" is defined as December 2017-February 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 DJF 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 (December 2017 to February 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 DJF 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 DJF period being in the top third (above average), middle third (average) or bottom third (below average) of historical DJF 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 DJF 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 (DECEMBER 2017-FEBRUARY 2018 inclusive)

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

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. 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 period will fall 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 average or warmer than average conditions. The estimated probability of above average temperatures (where given) ranges from 40% (UKMO) to as high as 70% (KMA) and is given as 50% by APCC and up to 50% across some regions of the UK by Météo France. The general indication from all of the above forecasts is that a colder than average UK DJF period is much less likely than an average or warm DJF 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 DJF 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 DJF 2017-18

There are a number of often competing climate factors that can influence the weather in the UK during 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 across most regions of the North Atlantic and is expected to remain above average over the next 3 months. This suggests a tendency towards a higher likelihood of a warmer and wetter period in the UK.

Conversely, Eurasian snow cover has continued to grow during November and remains above normal with Arctic sea ice extent still well below normal. High Eurasian snow cover and low Arctic sea ice together tend to produce more favourable conditions for strengthening Siberian and Greenland blocking highs in winter. Such weather patterns tend to increase the likelihood of a colder and drier period in the UK.

The North Atlantic Oscillation (NAO) and Arctic Oscillation (AO) are variations in large scale pressure patterns which influence the prevailing weather and can be represented as simple numeric indices: negative values of the NAO and AO indices at this time of year are associated with below average precipitation and temperature for the UK and positive NAO and AO phases are associated with warmer and wetter weather. The NAO and AO can (though often only weakly) be influenced by various other global climate signals.

A strong stratospheric polar vortex (SPV), for example, is often associated with a positive AO. The SPV has weakened over the last month but is still stronger than average and so in a phase which tends to increase the chances of wetter and warmer UK weather. However, the Quasi-Biennial Oscillation (QBO), a regular oscillation of the equatorial winds in the stratosphere, is in an easterly phase and this is likely to continue throughout the DJF period. This phase of the QBO tends to decrease the strength of the SPV, suggesting the possibility of drier and colder than average conditions developing through the period as the SPV and AO weaken over time. However, while the Madden-Julian oscillation (MJO), a pattern of thunderstorm activity in the tropics, is currently in a phase which tends to decrease the AO and NAO, it is expected to switch to a phase that favours positive NAO and AO during the next month or so, increasing the chances of warmer and wetter weather for the UK thereafter.

ENSO (the El Niño Southern Oscillation) is now in a La Niña phase with a ~65-75% chance that this will persist for the next few months. While the effects of ENSO are relatively well defined in some parts of the world they are less substantial in Europe, though there is some suggestion that La Niña may be linked to a decreased NAO during early (northern hemisphere) winter and a more positive phase of the NAO during January and February. So, the current potential influence of ENSO, like that of the MJO, is towards a lower NAO and AO during December before shifting towards a more positive phase during January and February.

In summary, there is some suggestion from current climate signals of an increased chance of below average precipitation and temperature during December with a switch to an increased chance of warmer and wetter weather during the first two months of next year. This is consistent with the suggestion from the seasonal forecast models of an average to above average 3-month period for temperature and rainfall overall.

Summary

Currently the most likely outcome for the December, January, February 2017-18 period is for it to begin colder and drier than average before shifting to milder and wetter conditions, possible during January. Therefore the 3 month period as a whole is most likely to have average or above average precipitation and temperature, although the colder and drier conditions cannot be completely ruled out, during this time period. This is a similar pattern as was seen last winter across the UK.

Future Seasonal Forecast Assessments

The next 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 DJF 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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