Met Office 3-month Outlook

Period: December 2016 – February 2017 Issue date: 24.11.16

The forecast presented here is for December and the average of the December-January-February period for the United Kingdom as a whole. The forecast for December will be superseded by the long-range information on the public weather forecast web page (www.metoffice.gov.uk/public/weather/forecast/#?tab=regionalForecast), starting from 2 December 2016.
This forecast is based on information from observations, several numerical prediction systems and expert judgement.

SUMMARY – TEMPERATURE:

During December below-average temperatures are more likely than above-average temperatures. The risk of impacts from cold weather is considerably higher than normal.
Predictions for UK-mean temperature for the whole of the winter season (December-January-February) show only a slight shift from the normal range of expected conditions. Nevertheless, this unremarkable outlook conceals a change from an increased risk of a cold start to winter to a greater likelihood of milder conditions later on. These different phases tend to balance the probability of above- and below-average conditions in the overall 3-month average, but the risk of cold weather impacts in the first half of winter is considerably greater than normal.
Overall, the probability that the UK-average temperature for December-January-February will fall into the coldest of our five categories is between 20% and 25% and the probability that it will fall into the warmest of our five categories is around 15% (the 1981-2010 probability for each of these categories is 20%). As stated above, however, these statistics conceal a shift in probabilities as winter progresses.

CONTEXT:

Sea surface temperatures in the tropical Pacific Ocean remain slightly cooler than average, close to the threshold for a La Niña event. While temperatures imply a 'neutral' state of the El Niño-Southern Oscillation, tropical Pacific rainfall patterns do appear to be similar to those expected during La Niña. Relatively little change is expected in the coming months. Weak La Niña conditions slightly increase the probability of blocking over the North Atlantic and Europe in early winter, but slightly increase the chance of more mobile, westerly weather in late winter. This would imply a shift in likelihood towards colder- and drier-than-average conditions for the UK early in winter and the reverse later on.
The Quasi-Biennial Oscillation (QBO), an oscillation of the equatorial winds in the stratosphere, remains in a westerly phase. The QBO influences winter conditions over Western Europe by modulating the strength of the stratospheric polar vortex (SPV) and thereby the phase of the North Atlantic Oscillation (NAO) at the surface. The westerly phase of the QBO tends to favour a stronger SPV, particularly in early winter, leading to a higher likelihood of a positive phase of the NAO. Despite the westerly QBO, the SPV is actually much weaker than normal this year and is expected to only slowly strengthen during December. A weak SPV tends to influence surface conditions with a delay of a few weeks. This implies an increased likelihood of negative NAO and blocking during December and January, which would increase the probability of cold weather in the UK during this first part of winter.
Arctic sea ice extent is at a record low level for the time of year. The largest sea ice deficits are in the Barents and Kara Seas. Recent research suggests that lack of sea ice especially in the Eurasian sector, may increase the likelihood of blocking patterns and the negative phase of NAO occurring in winter.
In the North Atlantic Ocean, sea surface temperatures are well above average in the western Atlantic near Newfoundland. This pattern of sea surface temperatures is thought to moderately increase the probability of above-average pressure in the central North Atlantic, leading to an increased frequency of northerly or northwesterly winds over the UK. At this time of year such a pressure pattern is often associated with below-average temperatures.
During December, the factors described above suggest an increased likelihood of negative NAO and blocking, which usually bring below-average temperatures for the UK. Predictions from the Met Office seasonal prediction system, along with those from other global forecast centres, offer strong and consistent support for this view. The left-hand graph in figure T2 shows a clear shift towards colder conditions. The chance of a prolonged spell of cold weather taking hold in December is high compared to normal, although more usual types of winter weather are not ruled out.
Through the early part of the 3-month period, colder-than-average conditions are more likely than milder-than average. Later in the winter, particularly into February, prediction systems signal a shift towards less likelihood of blocked weather patterns, which would imply a reduction in the chances of cold conditions. The effect of these different phases is to bring probabilities for the 3-month UK-average temperature into closer balance. Therefore, the right-hand graph of figure T2 does not tell the whole story and it should be emphasised that in the first part of winter the risk of cold weather impacts is considerably higher than normal.

Fig T1

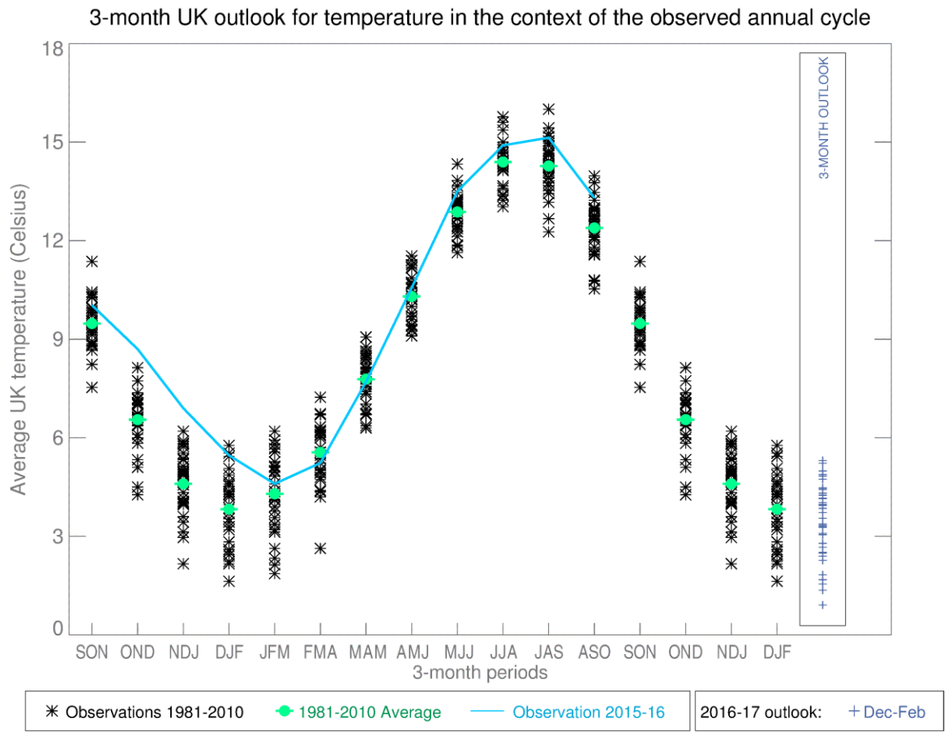


Fig T2

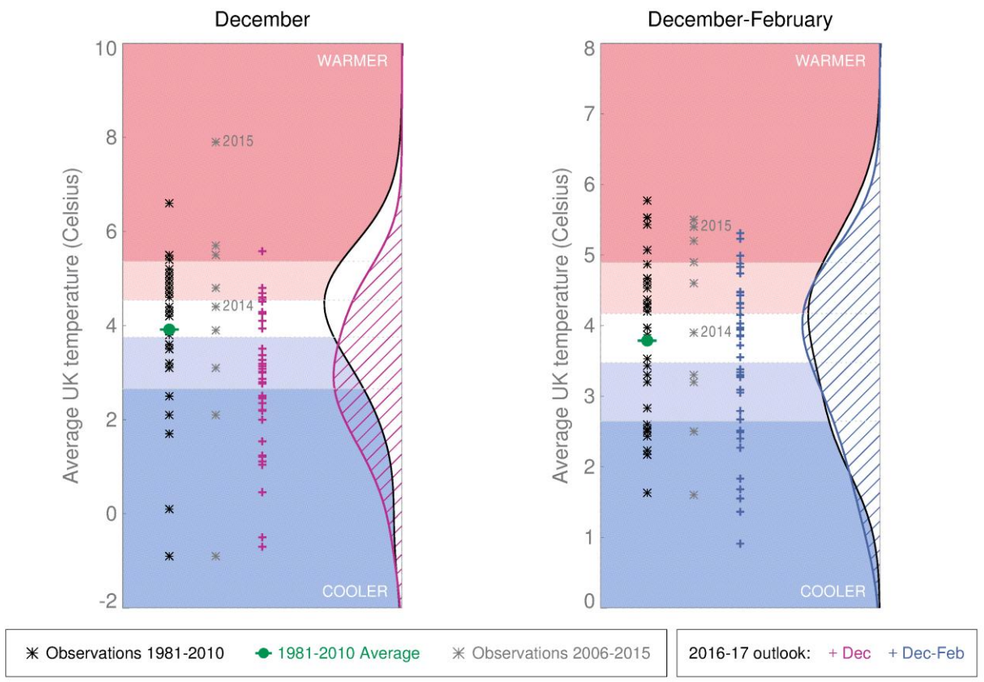
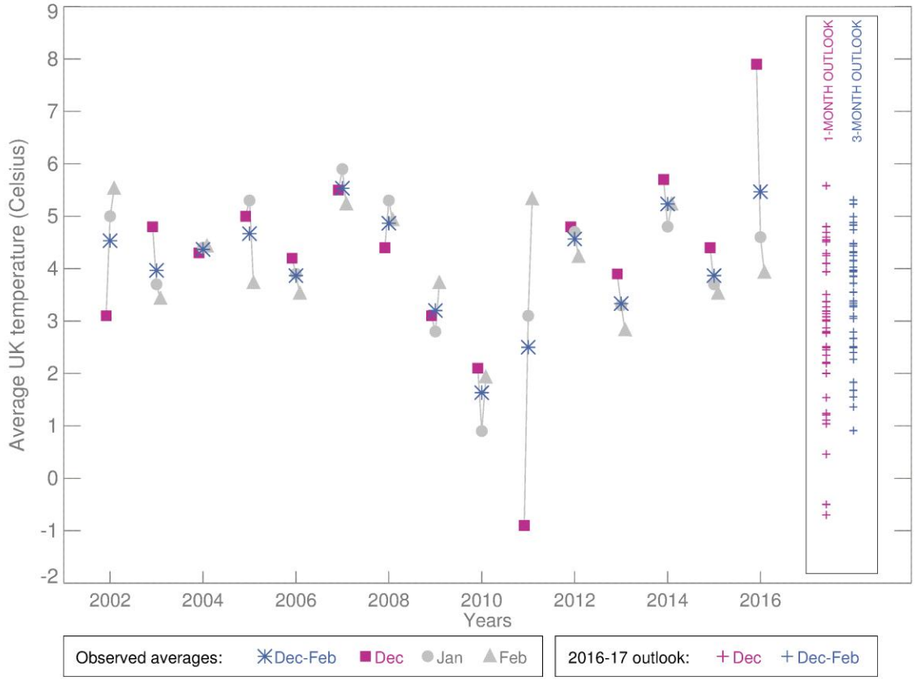


Fig T3



This Outlook provides an indication of possible temperature and rainfall conditions over the next 3 months. It is part of a suite of forecasts designed for contingency planners.

The Outlook should not be used in isolation but should be used with shorter-range and more detailed (30-day, 15-day and 1-to-5-day) forecasts and warnings available to the contingency planning community from the Met Office.