

SUMMARY ASSESSMENT OF SEASONAL FORECASTS FOR EUROPE

OCTOBER, NOVEMBER AND DECEMBER 2020

Executive Summary

Seasonal forecast models and climate signals suggest October-December 2020 is most likely to be milder and wetter than average across Scandinavia and drier than average across southern Europe.

Storms

While there is no dominant signal for northern Europe, the frequency of storms moving in from the North Atlantic is most likely to be above average for Scandinavia and below average for southern Europe, especially towards the end of the period.

Precipitation

Precipitation is most likely to be above average across Scandinavia and below average across southern Europe, with no dominant signal for northern Europe.

Temperature

Temperatures are most likely to be around or milder than the long-term climatological average across Europe.

Long-range Models

Numerical Weather Prediction models suggest October-December 2020 will most likely be wetter than average across Scandinavia and drier than average across southern Europe, with no dominant signal for northern Europe.

Climate Signals

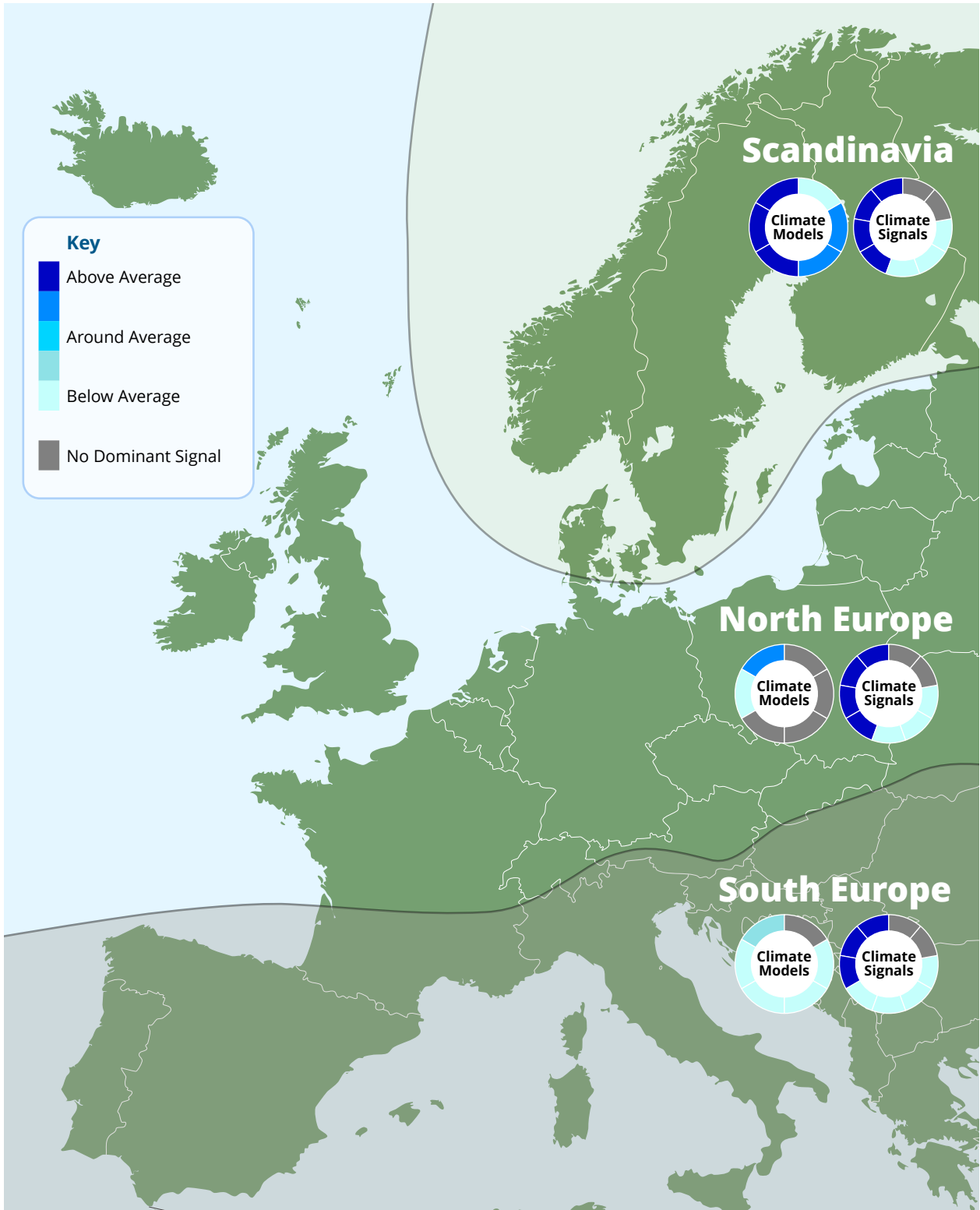
Climate signals suggest there may be slightly more potential for milder, wetter and windier conditions across northern Europe and Scandinavia towards the end of the 3 month period than towards the beginning.

This report is an early indication of conditions over winter 2020-2021 and will be updated in November.

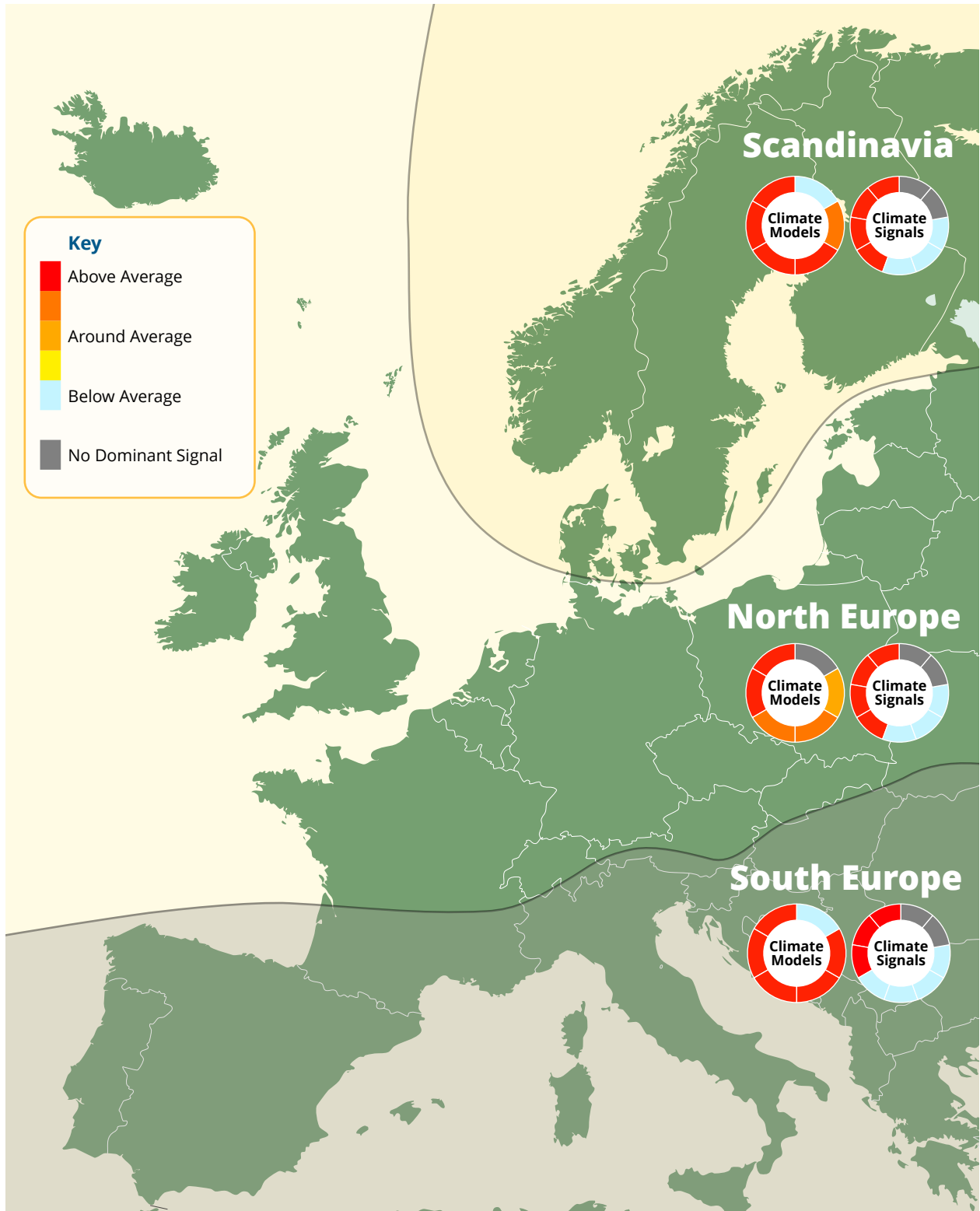
Europe Climate Regions for October – December 2020

We have extended our seasonal forecast to cover the whole of Europe which, for the purposes of this forecast analysis, can be broadly split into three climate regions: Northern Europe, Southern Europe and Scandinavia. The maps below summarise the conclusions from six climate models and nine climate signals.

Assessment Summary – Precipitation October, November and December 2020



Assessment Summary – Temperature October, November and December 2020

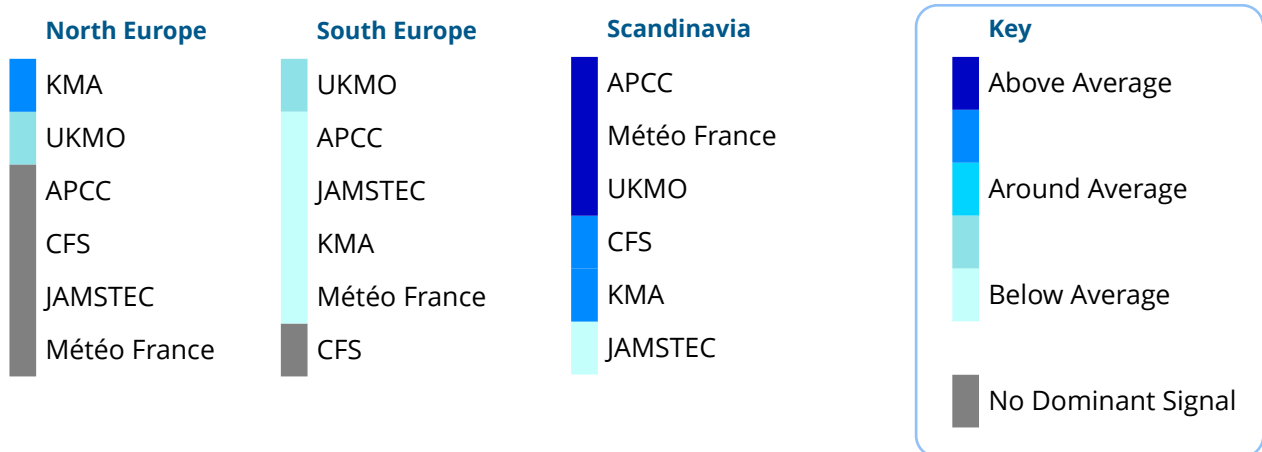


Seasonal Forecast Assessment Summary

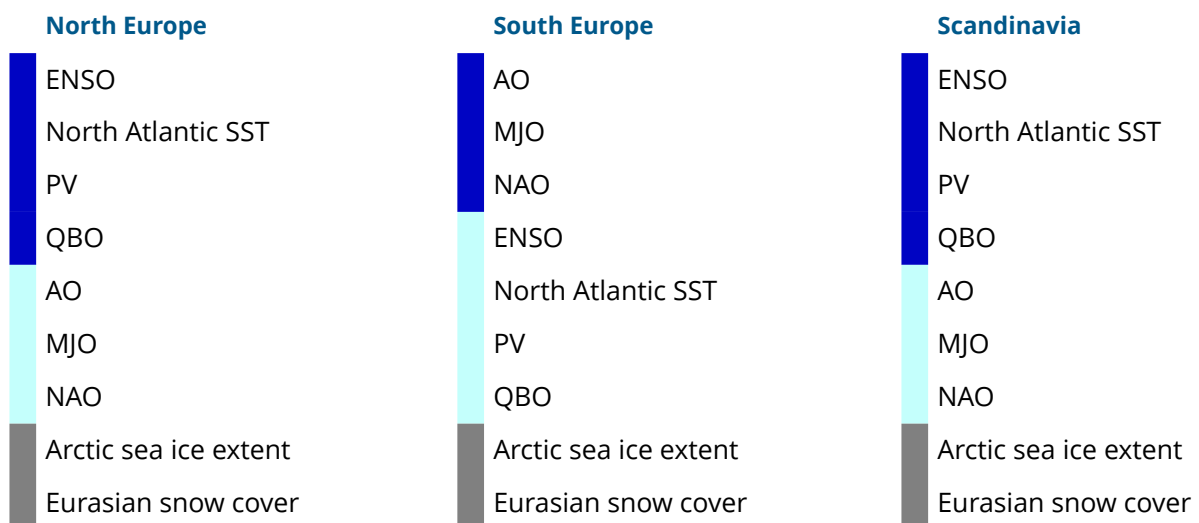
In order to produce this seasonal forecast assessment, the outputs of various seasonal forecast models have been analysed, along with some key climate indicators. In terms of the seasonal forecast models, EuroTempest has chosen to focus on precipitation and temperature as all agencies used in this report provide forecasts for both of these parameters, enabling a comparison across all agencies. Owing to the relationship between the occurrence of North Atlantic storms and mild and wet conditions, temperature and precipitation have been used as a proxy for storminess, as forecast models do not provide a direct measurement of storm occurrence. Similarly, despite the relationship between most climate signals and European weather being relatively weak, the status of these signals can often be suggestive of which weather types may be more likely to prevail, and so can be used to indicate trends in temperature, precipitation and storminess.

The seasonal forecasts and climate signals are summarised in the Seasonal Forecast Assessment section of this report. For more information on the characteristics of the signals please see the EuroTempest climate signals [factsheet](#). The implications of these models and signals on UK weather during OND 2020 are shown in the diagram below.

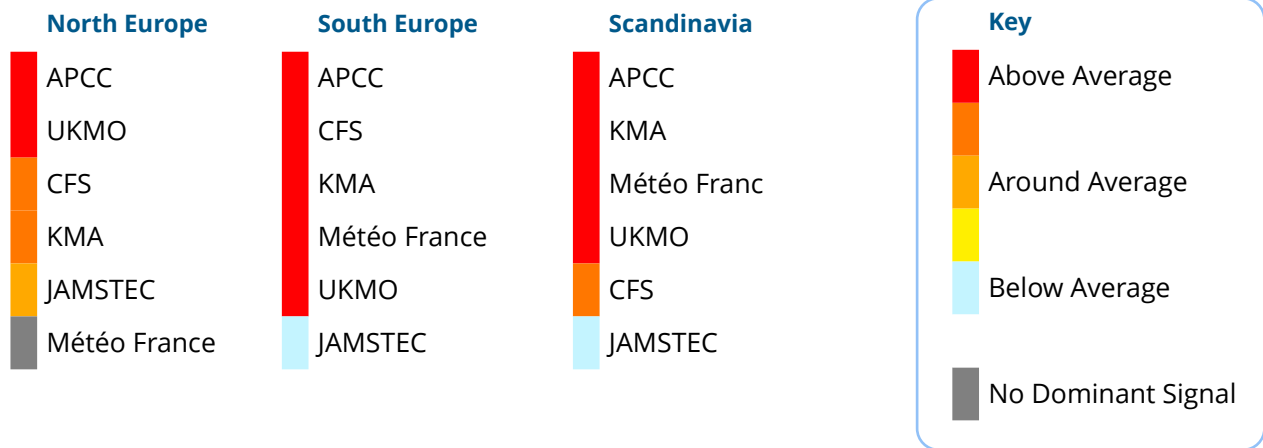
Precipitation - Climate Models



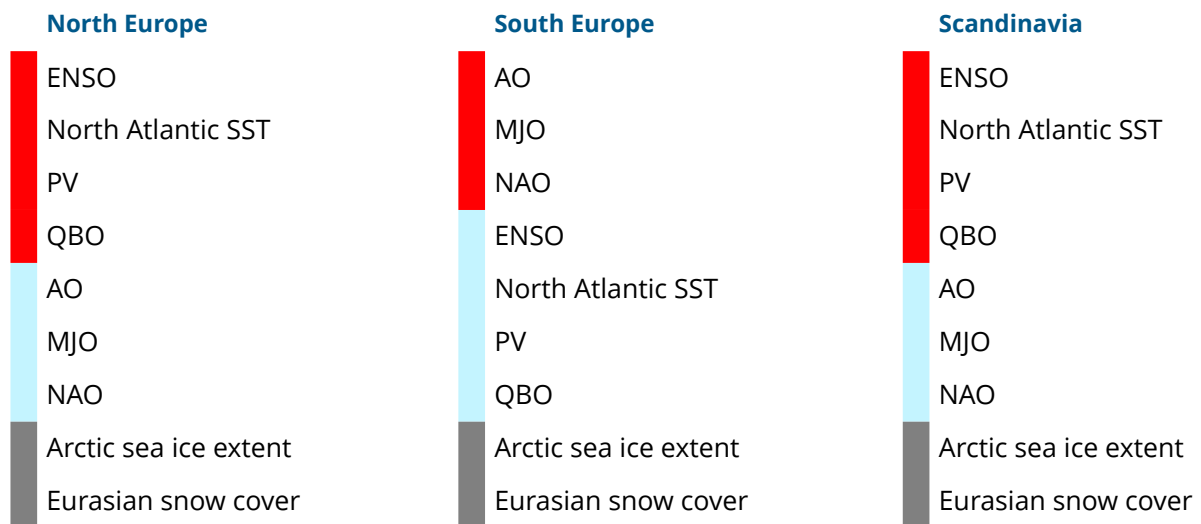
Precipitation - Climate Signals



Temperature - Climate Models



Temperature - Climate Signals



Extended Outlook

The following forecast is based on both the output of numerical weather prediction models and climate signals with a shorter term impact.

Early-Mid October

Weather models and some climate signals suggest that the next week or so will be characterised by conditions gradually turning drier and warmer across much of Europe with the possible exception of the south-west.

Remainder of October

Weather models and some climate signals suggest that mid to late October will be characterised by drier and cooler conditions than average across much of northern Europe and milder and wetter conditions across southern Europe.

Seasonal Forecast Assessment

Climate Models Summary

Precipitation:

There is some consistency in the seasonal forecast models towards above average precipitation across Scandinavia, below average precipitation across southern Europe and no dominant signal across northern Europe for OND with:

- five of the six NWP seasonal forecasts used in this report indicating above or around average precipitation across Scandinavia
- just one model indicating below average precipitation for Scandinavia
- four models suggesting each outcome (below, above or around average precipitation) is equally likely for northern Europe.

Temperature:

There is also some consistency in the seasonal forecast models towards above or around average temperatures across Europe for the OND period with:

- five of the six NWP seasonal forecasts indicating above average temperatures across all of Europe
- just one model suggesting below average temperatures - for Scandinavia and southern Europe.

For precipitation, the indication from the forecast models is that for Scandinavia the chance of an average or wet OND outweighs that of a relatively dry one, while for southern Europe the chance of an average or dry OND outweighs that of a wet OND. As for likely temperatures, a colder than average OND period is much less likely than an average or warm OND period across the whole of Europe. It should be noted however that “average” conditions are generally defined as the mean of the last 30 years or so. The generally increasing trend of warmer conditions associated with climate change makes it more likely that temperatures now will exceed these historical averages. Temperatures this OND period that are colder than those that Europe has experienced within the last few years could still be above “average” by this definition.

Models used:

UKMO: UK Met Office

CFS: The US National Centers for Environmental Prediction Climate Forecast System

JAMSTEC: Japan Agency for Marine-Earth Science and Technology

Météo-France: National Met Agency of France

KMA: Korea Meteorological Administration

APCC: APEC Climate Center (South Korea)

Climate Signals

There is an indication from climate signals is that the potential for milder, wetter and windier conditions across northern regions of Europe (including Scandinavia) may increase as the next three months progress. A currently negative NAO and AO suggest a slow start to the windstorm season but the combination of warm sea surface temperatures across the north Atlantic and a favourable phase of the QBO are consistent with a slightly increased likelihood of a positive NAO event towards the end of the OND period. Likewise, the influence of La Niña changes through the season, slightly decreasing the potential for mild, wet and stormy weather in the near term but having the opposite effect from around December onwards.

NAO: North Atlantic Oscillation

Current State: Negative

Projected State: Expected to be slightly negative over the next month.

Implications for European weather: Decreased potential for mild, wet and stormy periods across northern Europe and Scandinavia.

AO: Arctic Oscillation

Current State: Negative

Projected State: Expected to remain negative over the next month.

Implications for European weather: Decreased potential for mild, wet and stormy periods across northern Europe and Scandinavia.

PV: Polar Vortex

Current State: Strong

Projected State: Expected to remain strong

Implications for European weather: Potential for warmer and wetter conditions across northern Europe and Scandinavia, particularly later in the season.

QBO: Quasi-Biennial Oscillation

Current State: Westerly phase

Projected State: Westerly

Implications for European weather: Increased potential for mild, wet and stormy weather across northern Europe and Scandinavia and an increased chance of drier weather across southern Europe.

ENSO: El Nino Southern Oscillation

Current State: La Niña conditions

Projected State: ~75% chance of La Niña conditions continuing through the OND period.

Implications for European weather: La Niña slightly increases the potential for mild, wet and stormy weather across northern Europe and Scandinavia from around December onwards but has the opposite effect in preceding months.

MJO: Madden Julian Oscillation

Current State: Currently in phase 5

Projected State: Expected to move into a weak phase 6 during the next month.

Implications for European weather: Increased potential for a negative NAO during this phase and decreased potential for mild, wet and stormy periods across northern Europe and Scandinavia.

North Atlantic SST

Current State: Warmer than average in the north Atlantic.

Projected State: This pattern is expected to persist.

Implications for European weather: Increased potential for a positive NAO and milder, wetter and stormier periods across northern Europe and drier conditions across southern Europe.

Eurasian Snow Cover and Arctic Sea Ice Extent

Current State: Eurasian snow cover is around average while Arctic sea ice extent is below normal

Projected State: Arctic sea ice is expected to remain below normal

Implications for European weather: Some potential for colder and drier periods. However, this climate signal doesn't have as strong an influence on European weather during the next few months compared to later in the season.

Appendices

Seasonal Forecast Assessment - Notes

- This is not a EuroTempest forecast. This is a EuroTempest summary of a number of World Meteorological Organization (WMO) designated global producing centres for long-range forecasts. (<http://www.wmo.int/pages/prog/wcp/wcasp/gpc/gpc.php>)
- The brief summary of the possible climate signals gives some indications of possible weather patterns. However, these signals only give some suggestions and are not as detailed or refined as the WMO centres 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 three month period, they are not forecasts for weather conditions persisting throughout the whole of the period.
- 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 a 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 Europe, EuroTempest has taken account of forecasts produced by WMO designated global producing centres 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 as all agencies used in this report provide forecasts for both of these parameters, enabling a comparison across all agencies. Owing to the relationship between the occurrence of North Atlantic storms and mild and wet conditions, temperature and precipitation have been used as a proxy for storminess, as forecast models do not provide a direct measurement of storm occurrence.

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 period being in the top third (above average), middle third (average) or bottom third (below average) of historical periods in terms of observed mean precipitation or temperature.

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 period based on the historical record. Forecasts using this method are generally either stated as being above or below the average.

For example 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).

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 season that are colder than those that Europe has experienced within the last few years could still be above “average” by this definition.

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 summary tables. The entries in the table represent EuroTempest’s standardised interpretation (applied to Europe) of

the forecasts provided by each agency and do not necessarily represent a specific forecast for Europe 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.”

Seasonal Forecast Assessment - Sources

In assessing the outlook for the European winter season EuroTempest has taken account of forecasts produced by six agencies. These are either National Meteorological Agencies or other meteorological organisations. All six 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>

Météo-France

<http://www.meteofrance.com/accueil/previsions-saisonnières>

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>