

SUMMARY ASSESSMENT OF SEASONAL FORECASTS FOR EUROPE

NOVEMBER, DECEMBER AND JANUARY 2021/22

Executive Summary

There are some indications of an increased likelihood of lower than average European windstorm activity for Nov 2021 to Jan 2022. These indications are relatively weak as many climate models and observable climate signals are currently largely neutral and generally not producing any dominant signal in this regard. Seasonal forecast models are however consistent in suggesting that the next three months are likely to be warmer than average across the whole of Europe.

Storms

There are some indications, primarily from observable climate signals, that an active and impactful northern European windstorm season is slightly less likely than normal. However, many models and signals are neutral or providing no dominant signal and the possibility of a significant windstorm or active season is not precluded.

Precipitation

Observable climate signals suggest a slightly increased likelihood of below average seasonal precipitation totals across northern Europe and Scandinavia and above average totals across southern Europe. There is generally no consensus or dominant outcome for precipitation across any of the forecast models though some suggest an increased likelihood of above average precipitation across Scandinavia.

Temperature

Seasonal forecast models are consistent in suggesting that the next three months are likely to be warmer than average across the whole of Europe. There are some indications from climate signals of a slightly increased likelihood of cooler conditions across northern Europe and Scandinavia and warmer conditions across southern Europe.

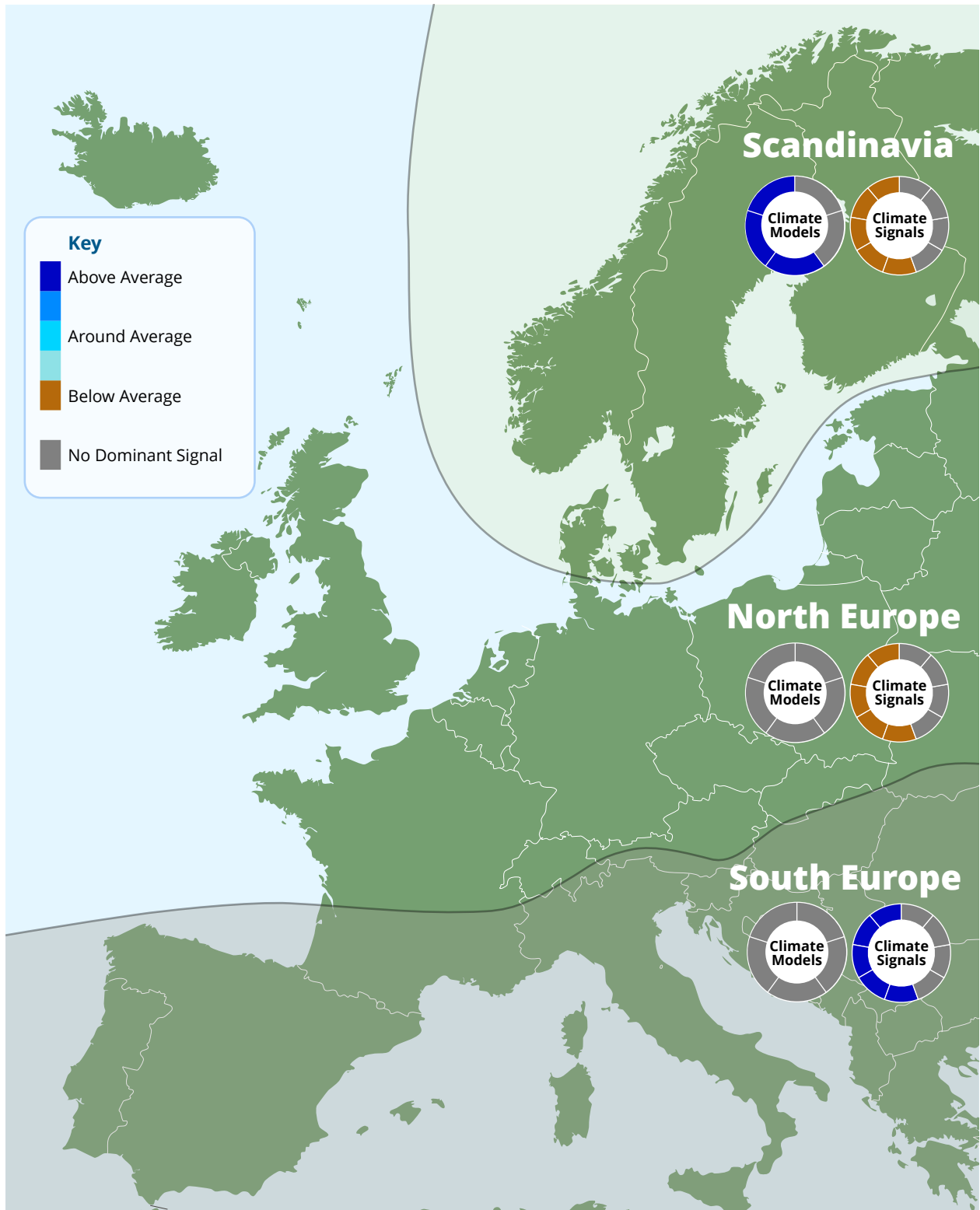
Analogue Years

Years in the historical record in which climate signals have been in a similar pattern to that currently prevailing were characterised by calmer conditions slightly more often than they were by active or impactful windstorm events.

A further Seasonal Forecast Assessment (for Dec 2021 to Feb 2022) will be issued in mid-December.

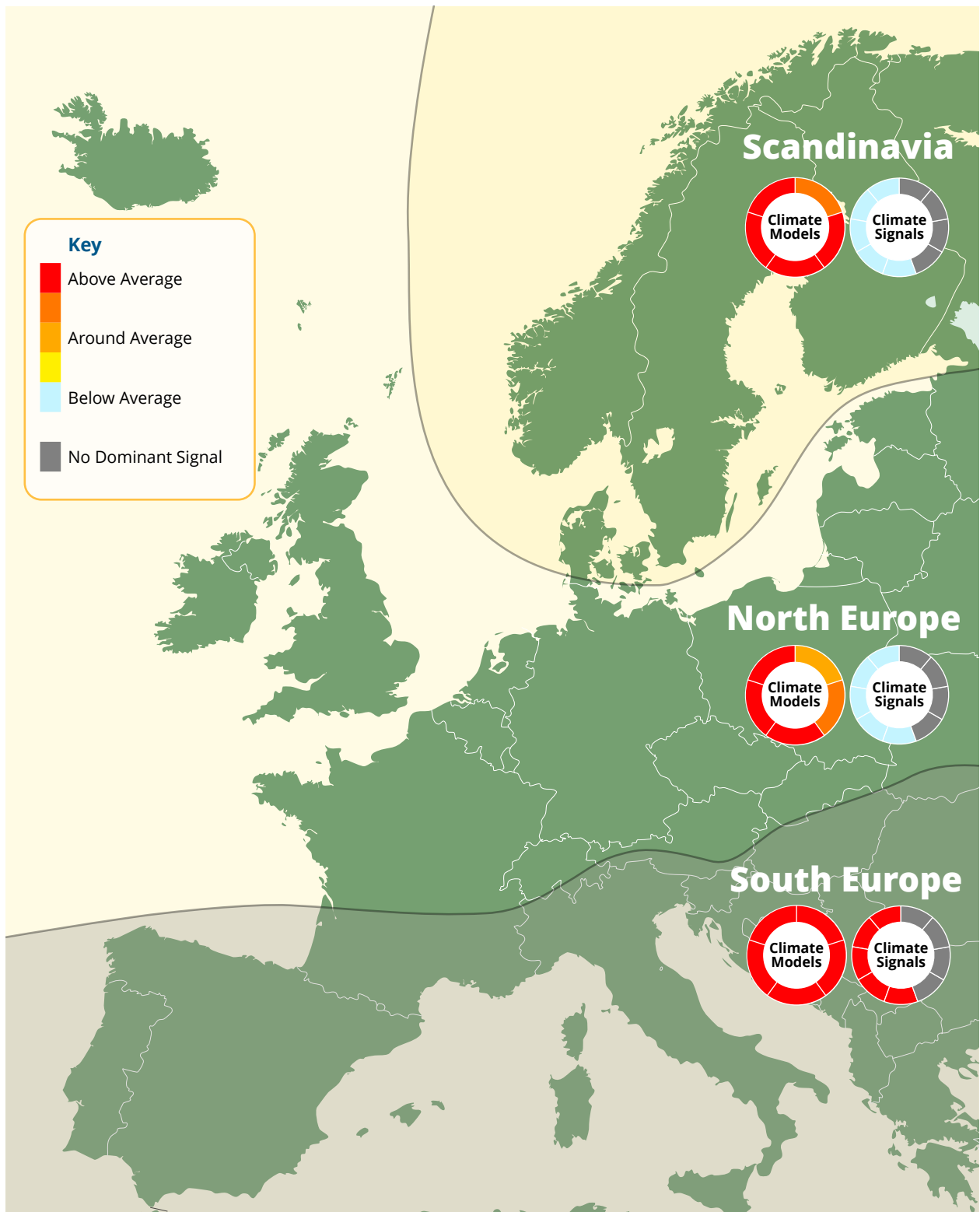
Assessment Summary – Precipitation

Precipitation November, December and January 2021/22



Assessment Summary – Temperature

Temperature November, December and January 2021/22



Extended Outlook

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

Next few weeks

Some unsettled conditions are possible this week and next, mostly across southern Europe and Scandinavia, though conditions generally are expected to remain largely settled, particularly across northern Europe.

First few weeks of December

Settled conditions are expected to become increasingly likely with drier and chillier conditions possible across Scandinavia and much of northern Europe.

Seasonal Forecast Assessment

Climate Models Summary

The lack of a dominant precipitation signal for much of Europe in any of the climate models indicates that (according to the models at least) all outcomes are equally likely - i.e. that the next three months are equally likely to see above, below or around average precipitation – although there is a suggestion in some of the models that there is a slightly increased likelihood of higher than average precipitation across Scandinavia. The climate models, as is often the case, suggest that a warmer than average November-December-January (NDJ) is much more likely than an average or cold three months across the continent but, as ever, it should be noted that “average” conditions are generally defined as the mean of the last 30 years or so. The general trend of increasingly warm conditions associated with climate change makes it more likely that temperatures now will exceed these historical averages and temperatures this NDJ period that are colder than those that Europe has experienced within the last few years could still be above “average” by this definition.

Climate Signals

While many climate signals are currently in a neutral or ambiguous phase, those that are not are all (albeit weakly in most cases) in a phase linked with an increased potential for cooler, drier and calmer periods across northern Europe and Scandinavia. ENSO conditions are currently close to and are continuing to trend towards a (weak) La Niña event for the winter (the Australian [BOM](#) estimates that there is a 70% chance that La Niña conditions will exist within the next month). Likewise, the temperature of the north Atlantic sea surface is just slightly below average for the time of year, Eurasian snow cover is just above average and Arctic Sea Ice coverage is slightly below average. The existing easterly phase of the QBO is expected to persist and potentially weaken the polar vortex as it begins to develop during the next few months. While all of these conditions are linked to an increased potential for cooler, drier and calmer periods across northern Europe and Scandinavia all but the QBO are only weakly in the influential phase. As such, there is certainly no strong indication from the climate signals of an increased likelihood of a very wet and active north European windstorm season (though that by no means rules such a season out) but what indications there are of an increased likelihood of a calmer and drier winter than average are relatively weak.

Signal	Current State	Projected State	Implications for European Weather
NAO: North Atlantic Oscillation	Near neutral	Expected to remain near neutral over the next month	Average conditions for the time of year.
AO: Arctic Oscillation	Near neutral	Current forecasts of the development of the AO over the next few weeks vary widely.	Ambiguous due to forecast model uncertainty.
PV: Polar Vortex	Developing	Expected to continue to develop over the next month	Few or none this month. PV doesn't have as strong an influence on European weather during the next month or so as it does in late December and into January
QBO: Quasi-Biennial Oscillation	Easterly Phase	Easterly	Easterly Increased potential for chillier, drier and calmer periods across northern Europe and Scandinavia, especially later in the period
ENSO: El Nino Southern Oscillation	Neutral / weak La Niña	70% chance of full La Niña conditions developing during the next month	Increased potential for chillier, drier and calmer periods across northern Europe and Scandinavia
MJO: Madden Julian Oscillation	Phase 4 (weak)	No consistent timescale for the progression through the phases	Few or none. Phase 4 is not thought to be an influential phase with respect to upcoming European weather.
North Atlantic SST	Slightly below average	This pattern is expected to persist	A slightly increased potential for chillier, drier and calmer periods across northern Europe and Scandinavia
Eurasian Snow Cover	Slightly above average	No projections available, only current observations	A slightly increased potential for chillier, drier and calmer periods across northern Europe and Scandinavia
Arctic Sea Ice Extent	Slightly below average	No projections available, only current observations	A slightly increased potential for chillier, drier and calmer periods across northern Europe and Scandinavia

For more information on the characteristics of the signals please see the EuroTempest [climate signals factsheet](#).

Historical Analogues to the Current Climatic Set Up

Possible characteristics of this upcoming winter can be proposed by finding years in which there was a similar climatic set up. There are, however, few definitive indications this year, as within the last 40 years only the year 2000 had a similar set up to that which we see now, with a developing La Niña event, an easterly QBO and around or below average North Atlantic SSTs at the start of November. There was also above average Eurasian snow cover at this point in the year in 2000, as there is now. In terms of outcomes, there were no notable European windstorms during the winter of 2000 (from November onwards), although windstorm Oratia (Tora) had affected northern mainland Europe and the UK in late October. Conditions generally were warmer and slightly wetter and windier than normal in southern Europe and slightly less wet and windy than average in northern Europe and Scandinavia.

Looking forward, if the climate signals develop through November as currently expected, a few other candidate reference years may come into play. The expected climatic set up for the beginning of December bears similarities to that seen in 1996 (as well as to 2000), and in terms of ENSO and the QBO at least, 1998 and 2017. With respect to storm activity from December through January for these years: 1996 was reasonably calm and 1998 and 2017 were reasonably active (e.g. windstorm (Friederike) David led to EUR1.7bn losses (PERILS) across northern Europe in January 2018). It is perhaps noteworthy, however, that in both of these more active windstorm years (of 1998 and 2017) the North Atlantic sea surface was markedly warmer than it is at present and than it was in the less active years of 1996 and 2000.

Overall, historical analogues to the current climatic set up suggest a broad range of possible outcomes. There are few very close analogues to this year, and while those that there are suggest that winters with this set up have had below average windstorm activity and impacts, this doesn't preclude the possibility of a significant windstorm event or an active season.

For more details on this method see the report entitled "Using Climate Signals to Forecast the UK Winter Storm Season" published [here](#).

