# What are Seasonal Forecasts?

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The day-to-day forecasts produced by Met Éireann are "deterministic" in the sense that they provide specific details regarding the weather with respect to location and time (e.g. "rain will reach Dublin around noon on Sunday..."). While great strides have been made in recent years in extending the range of forecasts, for fundamental reasons deterministic forecasts will never have any skill in predicting the weather weeks or months ahead. Seasonal forecasts take a different approach: they predict the climate, or more accurately the departures from the average climate, for the coming seasons. They are probabilistic in nature (e.g. "there is an 80% probability that the season will be drier than average...") and always relative to a mean climate. If the coming seasons are "average", the seasonal forecast may not be particularly useful. However, a forecast that can correctly identify the future occurrence of large departures or anomalies from the average has considerable potential. The key to success lies in the correct identification and modelling of the factors that push the climate away from the average.

An important source of seasonal predictability comes from the El Niño-Southern Oscillation (ENSO), a quasi-regular variation in the atmosphere and ocean in the tropical eastern Pacific. While ENSO produces climate anomalies in the Pacific, it is also linked to anomalies in temperature and precipitation across the globe, including the Atlantic; it is a dominant influence in the Earth's interannual climate variability although other oceanic anomalies also play a part.

The skill of the seasonal prediction system depends on the ability of the global coupled atmosphere-ocean models to accurately capture these effects. It will also depend on the strength of the anomalies - it is generally higher, for example, in the extreme phases of ENSO.

While this is a very active area of research, the skill displayed by current seasonal forecast models is slight in mid-latitudes. Undoubtedly, the quality will continue to improve with further research. Met Éireann does not produce seasonal forecasts but as an active member of the [European Centre for Medium-Range Weather Forecasts](#) (ECMWF) we have access to the Centre's products and we closely monitor their skill.

**Do we really need these models? Is there a simpler route to seasonal forecasting?**
Many non-modelling methods have been proposed over the years, some of which even gain a measure of public credibility due to a few lucky forecasts, but all wither away when subjected to the harsh light of scientific scrutiny or statistical evaluation.

Some of these methods have focused on analysing historical weather patterns to see if these might provide a clue as to how the weather evolves. It might seem plausible, for example, to hope that if we could find a match between today's weather pattern and a similar pattern in a weather archive that the current weather would develop as it did in the past. Unfortunately, the weather never exactly repeats itself; even if two patterns differ minutely, chaos (the "butterfly effect") will ensure that both will evolve into quite different patterns over a few days.

Other, even less plausible, methods appeal to some guiding force that controls the climate in a predictable way. The influence of the moon on the atmosphere, for example, has been suggested as a basis for seasonal prediction. While the moon does generate an atmospheric tide it is a very weak affair compared with its counterpart in the oceans. Its influence on the weather is extremely slight, as confirmed in sophisticated models of the tide; it does not control our climate.