



What is a seasonal forecast variable?

Seasonal forecasts variables are the likelihood of climate anomalies (deviations from the long term (30 year) mean), occurring for a particular month or season 1-12 months ahead.

Seasonal forecasts present the probability that a variable (for example, temperature, precipitation, discharge) deviates from its climatological average in the coming months. The predictability of any variable is not uniform geographically or temporally, thus a forecast should always be interpreted with skill information. Skillful seasonal climate and hydrological forecasts can support anticipatory management, for example flood control, expected inflow for hydropower or agricultural irrigation.

Seasonal **climate forecasts** are possible because of more or less cyclic phenomena in the coupling between ocean and atmosphere. The phenomena evolve over weeks to years, rather than the hours to days for weather forecasts, or the decades to centuries for climate scenarios (such as the El Nino Southern Oscillation (ENSO)). We can predict, to some extent the development of such phenomena, so we can also predict the precipitation and temperature deviations related to these.

For seasonal **hydrological forecasts**, the predictability of water related variables is based on the predictability of precipitation and evaporation and the status of the water system at the moment the forecast is issued. For example, if in a certain river basin the aquifers are full, or there is an extensive and thick snow pack, we can predict relatively high river flows for some time to come, irrespective of the amount of precipitation in the near future.

The **predictability (skill)** of a forecast varies in time and place and by variable. In some regions forecasts may be better in winter, in other places in summer. Generally, they are better for the near future (1-2 months ahead) than the far future (5-6 months ahead), but sometimes the reverse is true. Seasonal forecasts are generally based on a large ensemble of predictions, made by one or more models. The level of agreement between these ensemble members can be translated to a **forecast certainty**. If most members agree that there will be above-normal precipitation, then it is relatively certain. If many members do not agree, the forecast is uncertain.

- **Forecast skill** measures how often a past forecast was correct.
- **Forecast certainty** measures how certain a particular forecast is.

Seasonal forecast use in decision making **must account for both** skill and certainty.