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Multi-week/seasonal prediction for agricultural applications in Australia

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Multi-week/seasonal prediction for agricultural applications in Australia

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The main driver for the development of multi-week to seasonal prediction systems in Australia is to support decision making in the agricultural sector. The development of a new dynamical seasonal prediction model, ACCESS-S (Australian Community Climate and Earth-System Simulator –Seasonal), is a major step forward in the ability to predict climate variability on multi-week to seasonal time scales in Australia. The ACCESS-S modelling framework provides improved seasonal forecast skill and enables a range of products to be developed for various agricultural sectors.

A range of products have been developed and exposed to agricultural scientist and end-users. These products include: general climate drivers such as ENSO, the Indian Ocean dipole, the Madden-Julian Oscillation and the southern annular mode; forecast of extreme events, including heat waves, and extreme cold and wet periods; forecasts for the northern Australia wet season onset; and a range of tailored products, for example, forecasts of temperature humidity heat index.

To facilitate the development of products a quantile-quantile mapping calibration scheme was used to convert raw ACCESS-S model output at 60km to calibrated daily data at 5km. This calibration technique was applied to a range of variables used in driving agricultural models such as rainfall, temperature, radiation, wind speed and evaporation. This data has in turn been used to drive a range of agricultural models. For example, an agricultural package called Ask Bill has been developed to predict a range of sheep livestock quantities, including: available pasture, risk of fly strike, risk of heat stress and risk of cold sheep.

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