



Seamless Day 1 to Multiweek Forecasts

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Background

- Bureau Day 1-7 forecasts published to the Australian Digital Forecast Database (ADFD) are based on a statistically post-processed blend of NWP.
- Bureau Multiweek and Seasonal forecasts are generated using a 99-member lagged ensemble from ACCESS-S.
- The two systems do not produce consistent forecasts where they overlap.

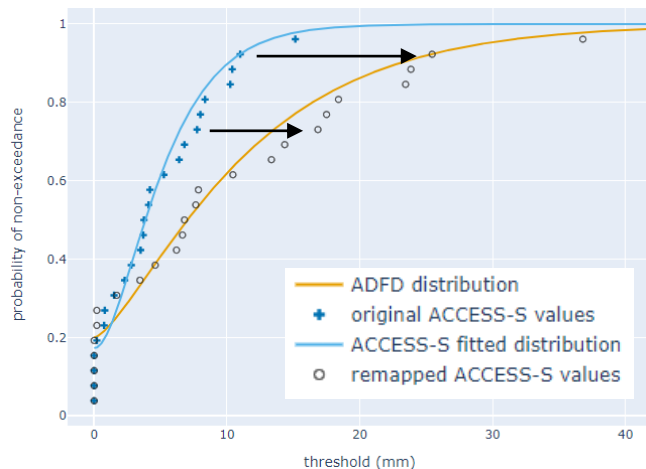
Aim: Apply an additional postprocessing step to ACCESS-S forecasts so that they are *consistent* with ADFD forecasts. **Consistent** means that the ensemble members are a plausible sample from the ADFD predictive distribution.

Benefits

- Day 1-7 and multiweek products tell a coherent story to customers.
- Substantial improvement in skill for ACCESS-S derived products in Week 1.
- Seamless extension of Day 1-7 products beyond Day 7.

Method for Daily Precipitation

1. Output 15UTC aligned daily precipitation from ACCESS-S to match ADFD alignment.
2. Reconstruct ADFD predictive distribution from 11 known points.
3. Fit ACCESS-S ensemble to a gamma distribution using parameter estimation techniques appropriate for large gridded data.

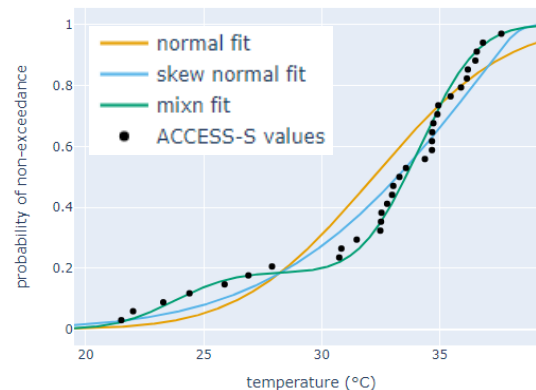


4. Remap ACCESS-S data from the fitted gamma distribution to the ADFD distribution via quantile matching. Adjust slightly to ensure best consistency for probability of precipitation.

Method for Daily Min and Max Temperature

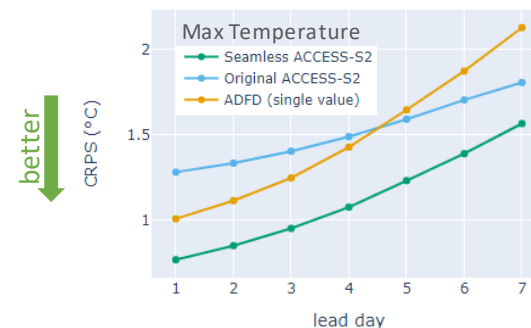
1. ADFD currently only publishes a single value: the expected temperature.
2. Shift the ACCESS-S2 ensemble values so that the ensemble mean matches the ADFD value.
3. If necessary, adjust any extreme values in shifted ensemble tails.

Probabilistic temperature forecasts may be published to the ADFD in the future. If so, use a similar method to precipitation. Rather than using gamma distribution, fit ACCESS-S data to the best fitting distribution of a normal, skew normal or mixture of two normals. Works for large gridded data.

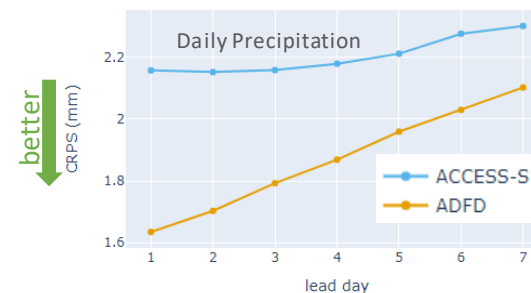


Predictive skill (verification)

ADFD-adjusted ACCESS-S outperforms both ADFD and ACCESS-S2 for Min and Max Temperature.



Accuracy of adjusted ACCESS-S precipitation expected to be similar to ADFD.



Annual R&D Workshop | 7-10 August 2023
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