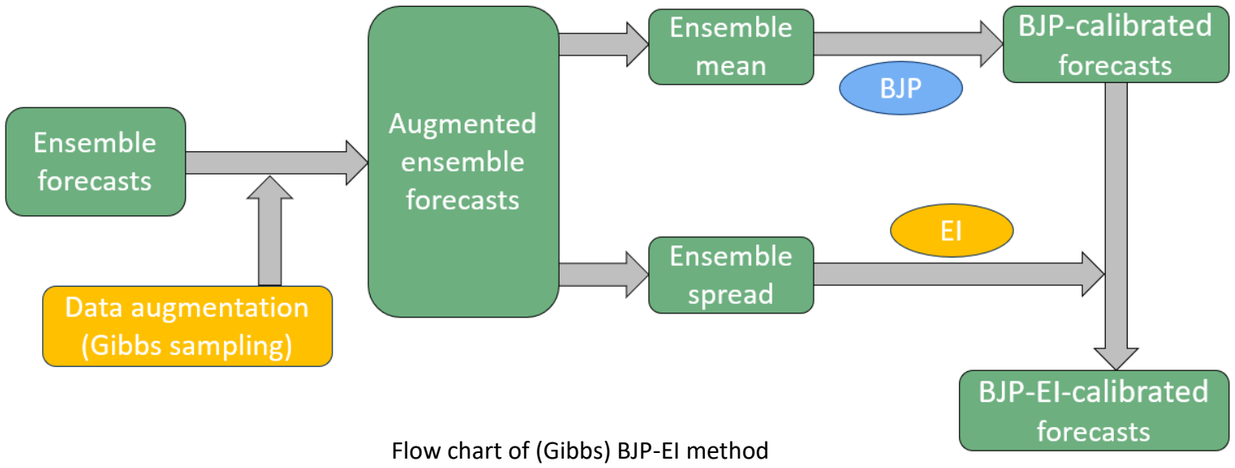
THE UNIVERSITY OF MELBOURNE
DEPARTMENT OF INFRASTRUCTURE ENGINEERING
UNIVERSITY OF MELBOURNE

Post-processing of ensemble forecasts from numerical weather prediction models

Research Problem

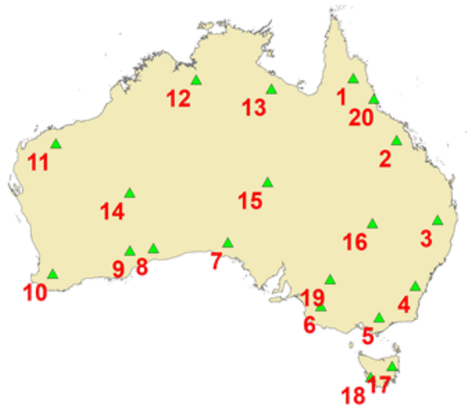
Comparison and combination between ensemble forecasts and deterministic forecasts, as well as appropriate utilization of ensemble spread from ensemble forecasts are not considered in current post-processing methods and analysis.



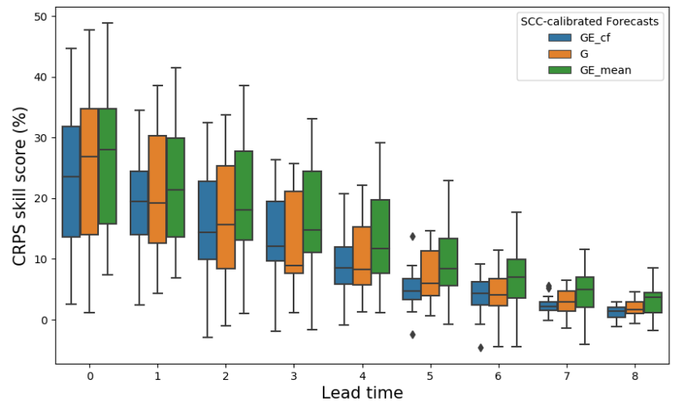
Flow chart of (Gibbs) BJP-EI method

Methodology

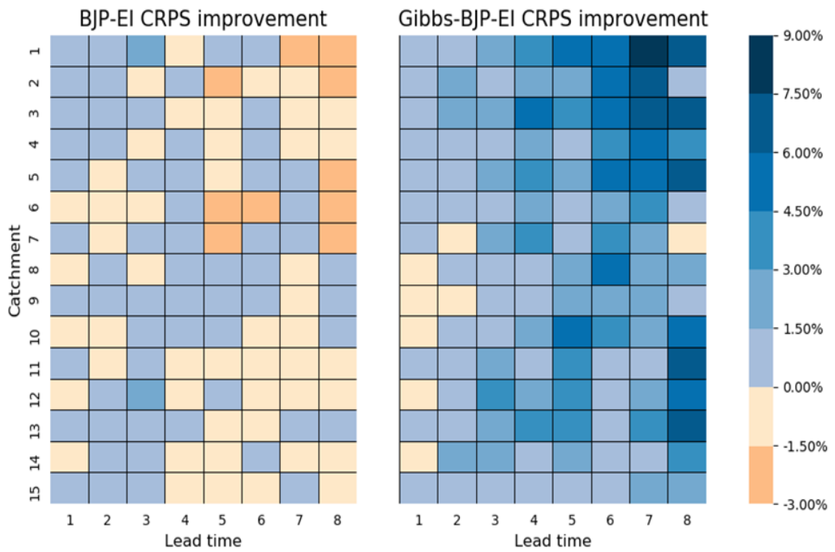
Seasonally Coherent Calibration (SCC) model;
Modified Bayesian joint Probability (BJP) model;
Evaluation measures: Correlation (KRCC), Accuracy (CRPS), reliability (PIT), etc.

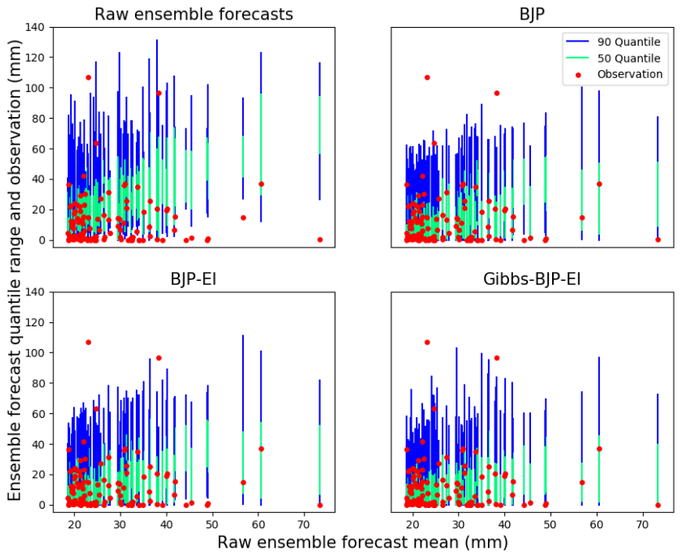


Selected sites for site-scale evaluation



CRPS skill score of SCC-calibrated forecasts





CRPSS improvement of EI-calibrated forecasts compared to BJP (1% large events)

Preliminary analysis

High-resolution ensemble mean forecasts outperform low-resolution deterministic forecasts;
Ensemble spread contributes more in large events;

Future Work

Apply model evaluation across Australia;
Explore more conditions for ensemble spread utilization;
Investigate Bayesian priors and optimization methods to combine ensemble forecasts and deterministic forecasts.

More Information

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