

Verification of Bureau's Convective Scale Models Using METplus

Mohammadreza Khanarmuei, Anuruddha Abhayasinghe, Beth Ebert, Brendan Dimech, George Cheng, John Sharples, Kevin Plastow, Mohammad Mahdi Hasan, Xiaoxi Wu

Bureau of Meteorology

In the Science and Innovation Group at the Bureau of Meteorology, a team of research scientists and software developers is working together to enhance the Bureau's verification capabilities through adopting METplus, a verification system developed by the National Center for Atmospheric Research (NCAR). While the Bureau currently relies on Jive, a Python-based verification system, to assess the quality of its official weather forecasts, the implementation of METplus aims to strengthen the verification capability for the Bureau's Numerical Weather Prediction (NWP) models.

We gathered requirements from scientists and operational meteorologists, leading to the identification of over 80 priority verification tasks for the first phase of the project. Out of those verification jobs, we started with nine representative verification cases that cover the range of models, observations, and parameters, which allow us to further explore the tools and methods available in METplus. Within this phase, we developed a Python program specific to the Bureau's forecast and observation data to facilitate data pre-processing. Additionally, we formulated a set of recommendations on how best to utilise METplus for verifying Bureau NWP model variables, including selecting suitable metrics and interpolation techniques.

Initially, our key focus was verifying rainfall and wind forecasts generated by the Australian Community Climate and Earth-System Simulator City and City Ensemble (ACCESS-C/CE) models against gridded and point-based observations. In this work, we provide an overview of our end-to-end verification process of ACCESS-C/CE rainfall and wind using METplus, from the preprocessing of the input data to post-processing and visualisation steps. We will also discuss a comparison of verification results between the Bureau NWP global models (ACCESS G/GE) and ACCESS-C/CE using novel verification methods available in METplus, such as High Resolution Assessment (HiRA).