# Ocean Model, Analysis and Prediction System version 3: operational global ocean forecasting

Gary Brassington, Paul Sandery, Pavel Sakov, Justin Freeman, Prasanth Divakaran, and Duan Beckett
Environment and Research Division, Bureau of Meteorology, Australia (g.brassington@bom.gov.au)

The Ocean Model, Analysis and Prediction System version 3 (OceanMAPSv3) is a near-global (75S-75N; no sea-ice), uniform horizontal resolution (0.1°x0.1°), 51 vertical level ocean forecast system producing daily analyses and 7 day forecasts. This system was declared operational at the Bureau of Meteorology in April 2016 and subsequently upgraded to include ACCESS-G APS2 in June 2016 and finally ported to the Bureau's new supercomputer in Sep 2016. This system realises the original vision of the BLUElink projects (2003-2015) to provide global forecasts of the ocean geostrophic turbulence (eddies and fronts) in support of Naval operations as well as other national services. The analysis system has retained an ensemble-based optimal interpolation method with 144 stationary ensemble members derived from a multi-year hindcast. However, the BODAS code has been upgraded to a new code base ENKF-C. A new strategy for initialisation has been introduced leading to greater retention of analysis increments and reduced shock. The analysis cycle has been optimised for a 3-cycle system with 3 day observation windows retaining an advantage as a multi-cycle time-lagged ensemble. The sea surface temperature and sea surface height anomaly analysis errors in the Australian region are 0.34 degC and 6.2 cm respectively an improvement of 10% and 20% respectively over version 2. In addition, the RMSE of the 7 day forecast has lower error than the 1 day forecast from the previous system (version 2). International intercomparisons have shown that this system is comparable in performance with the two leading systems and is often the leading performer for surface temperature and upper ocean temperature. We present an overview of the system, the data assimilation and initialisation, demonstrate the performance and outline future directions.