

Monitoring real-time observational data used by operational OceanMAPS

Abstract Section 3.2

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Introduction

The Ocean Model Analysis and Prediction System (OceanMAPS) has been operational at the Australian Bureau of Meteorology since August 2007. OceanMAPS has resulted from the development of the BLUElink project, which is a collaboration between the Australian Bureau of Meteorology, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the Royal Australian Navy. OceanMAPS is a global ocean forecasting system with high horizontal resolution of 0.1° in the Australasian region which is required to resolve mesoscale eddies and coarse resolution elsewhere. There are 51 vertical levels and high vertical resolution over the top 200m to resolve the mixed layer.^{1,2} OceanMAPS provides analyses and forecasts of ocean temperature, salinity and currents out to 7 days lead time.

OceanMAPS consists of a sequential procedure:

- Collection of observations from both *in situ* and remotely sensed sources.
- Preparation of surface forcing fields from the Numerical Weather Prediction (NWP) output.
- BLUElink Ocean Data Assimilation System³(BODAS) which provides the best estimate of the initial ocean state.
- Ocean Forecast Australia Model (OFAM) which provides a 7 day ocean forecast.

Verification of OceanMAPS forecast Sea Surface Temperature (SST) and the Sea Surface Height for the Australian region is presented.

Performance

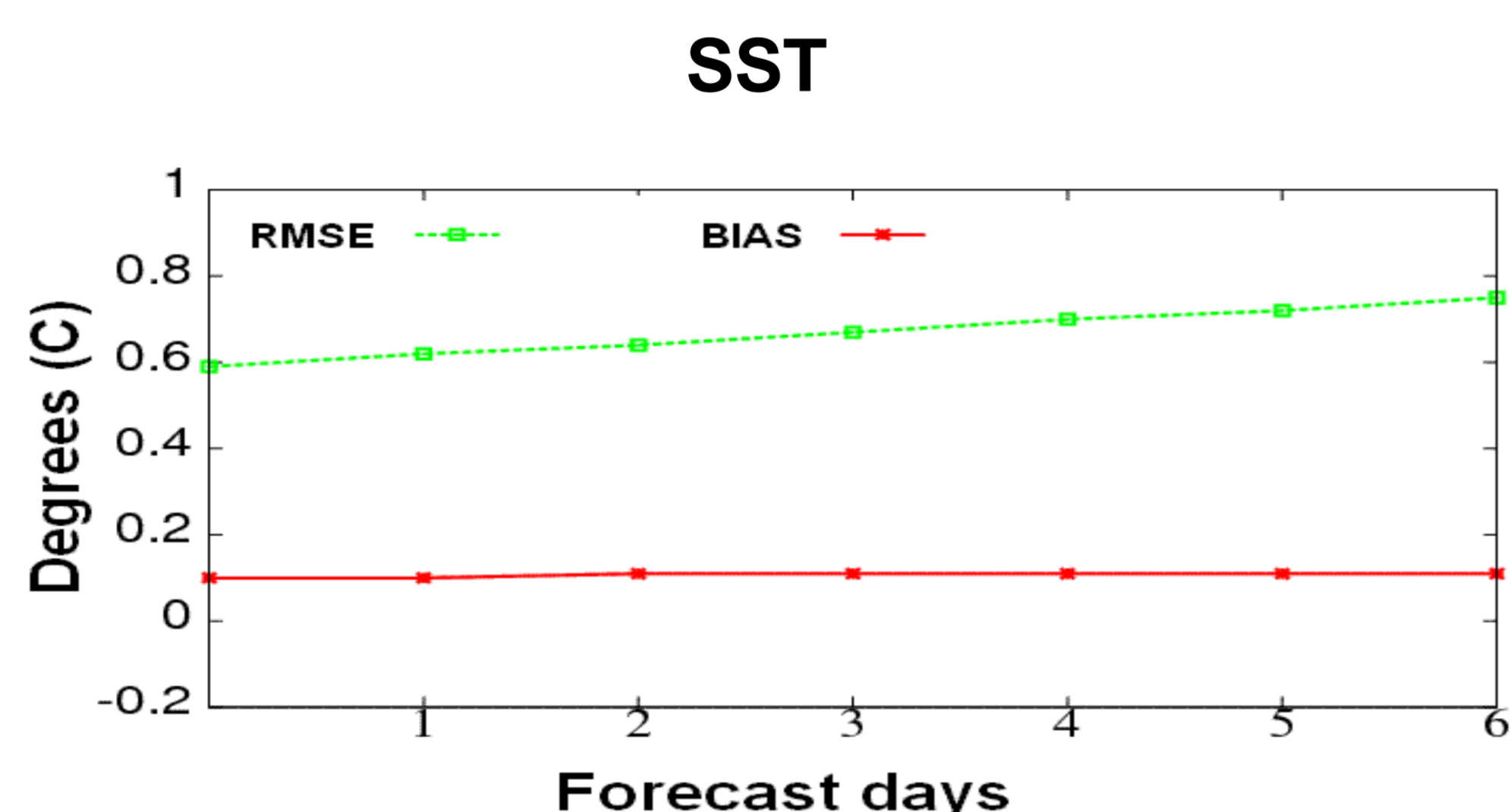


Figure 1. OceanMAPS forecast SST verified with RAMSSA (Australian Bureau of Meteorology Regional Australian Multi-Sensor SST Analysis⁴) from Jan to Mar 2013 over the region 5°S to 55°S, 100°E to 170°E (Australian region).

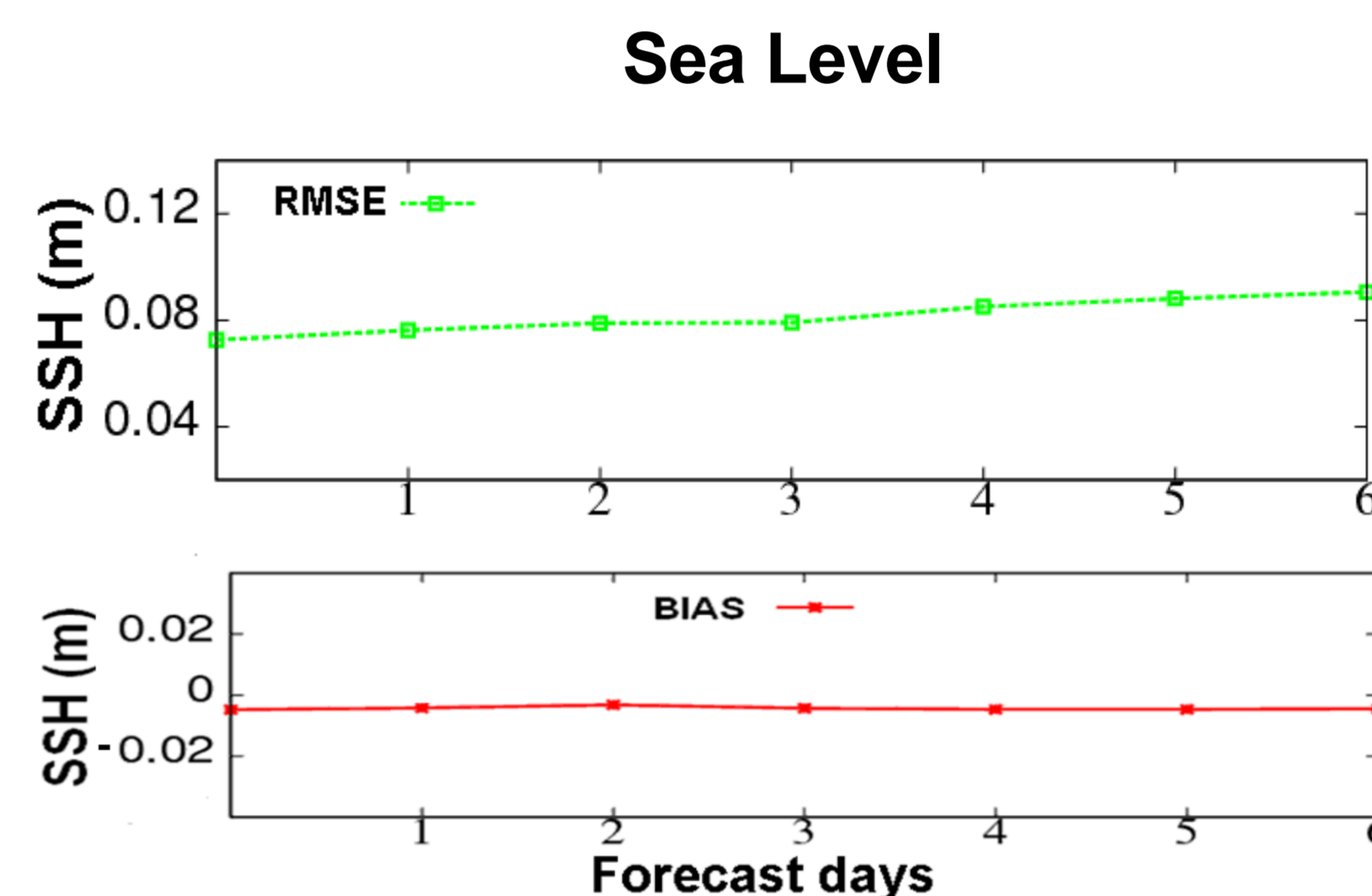


Figure 2. OceanMAPS forecast Sea Surface Height (SSH) verified with BODAS non real-time analysis from Jan to Mar 2013 over the Australian region.

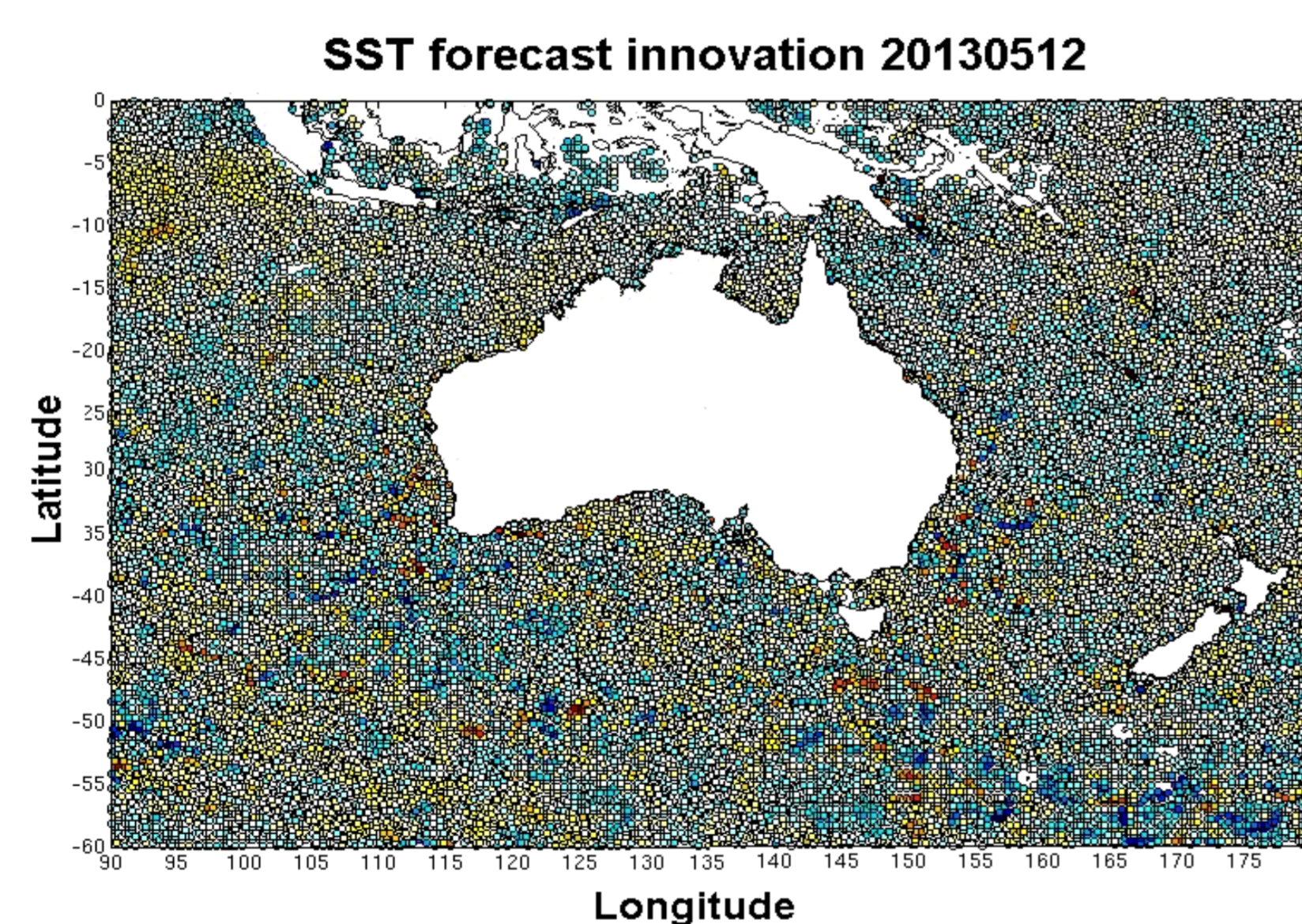


Figure 3. SST forecast innovation 12 May 2013.

Forecast innovation =
forecast – observation

SST observation:
WindSat, NOAA-18, NOAA-19, METOP-A

SLA observation: Jason-1,
Jason-2, CryoSat-2

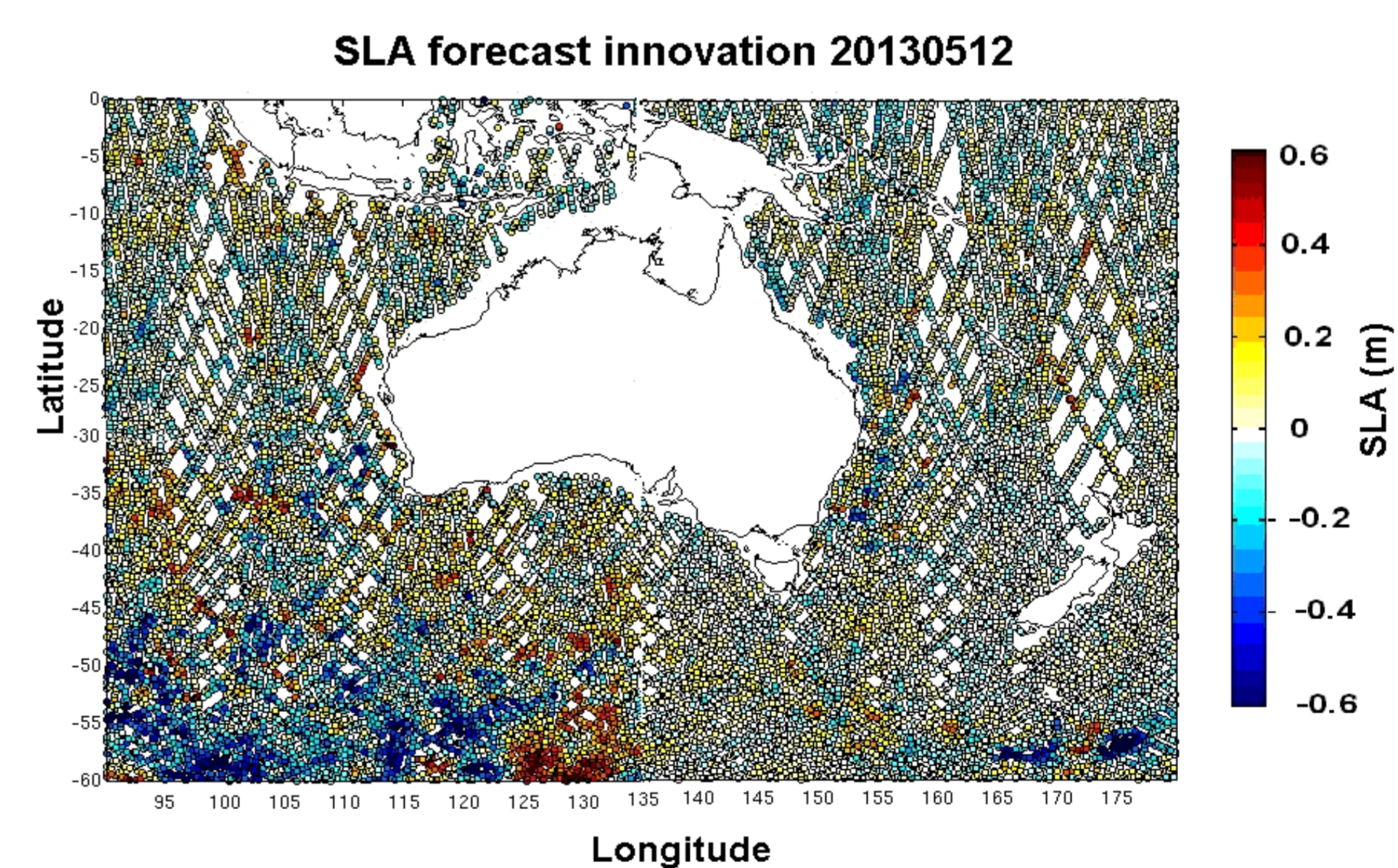


Figure 4. Sea Level Anomaly (SLA) forecast innovation 12 May 2013.

Conclusions

- RMSE of OceanMAPS forecast SST ranged from 0.6°C at base time to 0.8°C at forecast day 6 over the Australian region during January to March 2013.
- RMSE of OceanMAPS forecast SSH ranged from 7-9 cm over the Australian region during January to March 2013.
- Error of SLA appeared to be larger at high latitudes, which may due to inaccuracies in the representation of bathymetry and mean dynamic topography.

References

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