S2S-1.0 seasonal forecast system

The GEOS-5 AOGCM known as S2S-1.0 has been in service from June 2012 through January 2018 (Borovikov et al. 2017). The atmospheric component of S2S-1.0 is Fortuna-2.5, the same that was used for the Modern-Era Retrospective Analysis for Research and Applications (MERRA), but with adjusted parameterization of moist processes and turbulence. The ocean component is the Modular Ocean Model version 4 (MOM4). The sea ice component is the Community Ice CodE, version 4 (CICE). The land surface model is a catchment-based hydrological model coupled to the multi-layer snow model. The AGCM uses a Cartesian grid with a 1° × 1.25° horizontal resolution and 72 hybrid vertical levels with the upper most level at 0.01 hPa. OGCM nominal resolution of the tripolar grid is ½°, with a meridional equatorial refinement to ¼°.

In the coupled model initialization, selected atmospheric variables are constrained with MERRA. The Goddard Earth Observing System integrated Ocean Data Assimilation System (GEOS-iODAS) is used for both ocean state and sea ice initialization. SST, T and S profiles and sea ice concentration were assimilated. For 35 years, every 5 days, a 9-month coupled seasonal hindcast has been initialized. In this study we included 4 mid-month hindcasts, concurrent with the hindcasts for the new forecast system S2S-2.1 (in production mode since Dec 2017).

Corroborations

This study was inspired by Xue et al (2013). We have found a shift in the hindcasts bias and ENSO skill from the earlier to the later analysis period in the S2S-1.0 system as in CFSv2, which is comparable in many ways.

References
