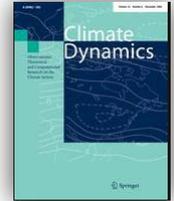




Topical Collection on Climate Forecast System Version 2 (CFSv2)

A Topical Collection on Climate Forecast System version 2 (CFSv2), consisting of 24 papers published in the *Climate Dynamics* international journal, is now complete. The National Centers for Environmental Prediction (NCEP), Center for Ocean-Land-Atmosphere Studies (COLA), and Climate Program Office (CPO) organized this collection, contributed by many research groups, to document significant advances in CFSv2 simulation of climate variability and prediction of key climate variables, in comparison to the previous version. This collection provides direction for the development of the next generation CFS, demonstrating an example of broad community research in support of NOAA's operational mission achieved through collaboration between NOAA's Office of Oceanic and Atmospheric Research (OAR) and National Weather Service (NWS).



CFSv2 is a NCEP coupled global climate model used for operational intraseasonal-to-interannual (ISI) prediction. After several years of development with substantial contributions from CPO supported research, NCEP implemented CFSv2 into operations in March 2011.

This collection was coordinated by Jin Huang, Annarita Mariotti, Jim Kinter, and Arun Kumar; the Chief Editor was Edwin Schneider.

IN THIS TOPICAL COLLECTION

- Preface to CFSv2 topical collection** (Huang et al.): provides a brief introduction to the Topical Collection on CFSv2.
- Impact of land-atmospheric coupling in CFSv2 on drought prediction** (Roundy et al.): analyzed CFSv2 reforecasts compared to CFS reanalysis (CFSR) from 1982-2009 in terms of its climatological land-atmospheric interactions, to better understand forecast skill degradation during the summer months and its connection to the land-atmosphere interactions.
- Evaluation of the CFSv2 CMIP5 decadal predictions** (Bombardi et al.): assessed results from NCEP and COLA CFSv2 retrospective decadal forecast analyses using different oceanic initial conditions (CFSR and COMBINE-NV) as part of the Coupled Model Intercomparison Project 5.
- Climate drift of AMOC, North Atlantic salinity and arctic sea ice in CFSv2 decadal predictions** (Huang et al.): evaluated CFSv2 simulation of the North Atlantic climate using a set of ensemble decadal hindcasts and several 30-year simulations initialized from realistic ocean-atmosphere states, for the potential to extend the model to predict decadal variability.
- Multi-model MJO forecasting during DYNAMO/CINDY period** (Fu et al.): examined the forecast skill of the Madden-Julian Oscillation (MJO) observed during the period of DYNAMO/CINDY field campaign in the GFS, CFSv2, and UH models, and their strength and weakness in forecasting initiation and propagation of the MJO.
- Characteristics of the water cycle and land-atmosphere interactions from a comprehensive reforecast and reanalysis data set: CFSv2** (Dirmeyer): analyzed the water cycle behavior in the CFSv2 reforecasts and reanalysis, specifically the evolution of forecast biases as the lead-time changes and how the lead-time dependent model climatology differs from the reanalysis.
- CFSv2 ensemble prediction of the wintertime Arctic Oscillation** (Riddle et al.): assessed skill in forecasting December-February Arctic Oscillation (AO) interannual variability using lagged ensembles from the CFSv2 seasonal hindcast dataset.
- Cloud vertical distribution from radiosonde, remote sensing, and model simulations** (Zhang et al.): evaluated GFS cloud layer distribution simulations based on a long-term radiosonde-based cloud profile product over the Southern Great Plains, ground-based, and space-borne remote sensing products.
- Interannual variability of the South Pacific Ocean in observations and simulated by the NCEP Climate Forecast System, version 2** (Guan et al.): examined the South Pacific Ocean Dipole (SPOD) mode mechanism, using a 50-year CFSv2 simulation and 50-year observation-based ocean-atmosphere analyses (1961-2010).
- Diagnosis and testing of low-level cloud parameterizations for the NCEP/GFS model using**

- satellite and ground-based measurements (Yoo et al.): evaluated the quality of GFS model cloud simulations and the causes for some systematic simulation errors, through the use of satellite and ground-based measurements.
11. **Predictions of Nino 3.4 SST in CFSv1 and CFSv2: a diagnostic comparison** (Barnston and Tippett): assessed the performance of CFSv1 versus CFSv2 in predicting monthly ENSO-related Nino3.4 SST index anomalies, using the 1982-2009 hindcast period for lead times of up to 9 months.
 12. **Prediction of global patterns of dominant quasi-biweekly oscillation by the NCEP Climate Forecast System version 2** (Jia et al.): analyzed CFSv2 hindcast daily output to understand its atmospheric variability forecasting skill on a quasi-biweekly (QBW) time scale, focusing on 8 dominant QBW oscillation modes.
 13. **Role of ocean-atmosphere interaction in northward propagation of Indian summer monsoon intra-seasonal oscillations (MISO)** (Sharmila et al.): used CFSv2 and the GFS atmospheric component to examine the role of atmospheric dynamics and ocean-atmospheric coupling in MISO initiation, maintenance, and northward propagation using three numerical simulations.
 14. **Variability of the Indian Ocean SST and its possible impact on summer western North Pacific anticyclone in the NCEP Climate Forecast System** (Jiang et al.): evaluated the prediction of SST in the Indian Ocean (IO) and the impact of IO SST, specifically local SST vs. remote forcing of tropical IO SST, on the summer anomalous anticyclone circulation over the western North Pacific.
 15. **Evaluation of summer temperature and precipitation predictions from NCEP CFSv2 retrospective forecast over China** (Luo et al.): assessed the ability of CFSv2 to predict summer temperature and precipitation over China using the 120 9-month reforecast runs initialized between January 1 and May 26 during each year of the reforecast period, evaluated as an ensemble forecast.
 16. **CFSv2 prediction skill of stratospheric temperature anomalies** (Zhang et al.): assessed CFSv2 reforecast prediction skill of stratospheric temperature anomalies, beyond the tropospheric predictability time scale of 2 weeks, for January 1999 to December 2010.
 17. **MJO prediction in the NCEP Climate Forecast System version 2** (Wang et al.): assessed CFSv2 MJO prediction based on its hindcasts initialized daily from 1999-2010, focused on MJO indices taken as principal components of the two leading empirical orthogonal functions.
 18. **Evaporation-precipitation variability over Indian Ocean and its assessment in NCEP Climate Forecast System (CFSv2)** (Pokhrel et al.): aimed to investigate all aspects of the Evaporation-Precipitation (E-P) distribution and variability over the Indian Ocean (IO) basin using Objectively Analyzed air-sea Fluxes (OAFflux) data and CFSv2.
 19. **Evaluation of cloud properties in the NOAA/NCEP global forecast system using multiple satellite products** (Yoo and Li): analyzed cloud properties, including the occurrence and fraction of clouds in up to three layers, cloud optical depth, liquid water path, and ice water path, simulated by the GFS using three satellite products.
 20. **Climate mean, variability and dominant patterns of the Northern Hemisphere wintertime mean atmospheric circulation in the NCEP CFSv2** (Peng et al.): analyzed the Northern Hemisphere wintertime mean 200hPa geopotential height climate mean, variability, and dominant patterns in a CMIP and a set of AMIP simulations from CFSv2, in comparison to the NCEP/NCAR reanalysis.
 21. **Improved reliability of ENSO hindcasts with multi-ocean analyses ensemble initialization** (Zhu et al.): assessed how the ocean initial conditions' structural uncertainty affects seasonal forecast reliability using a new ensemble generation method, the multiple-ocean analysis ensemble (MAE) initialization.
 22. **Prediction and monitoring of monsoon intraseasonal oscillations over Indian monsoon region in an ensemble prediction system using CFSv2** (Abhilash et al.): developed an ensemble prediction system (EPS) for the extended range prediction (ERP) of monsoon intraseasonal oscillations (MISO) of Indian summer monsoon (ISM) using CFSv2, and evaluated the general simulation of ISM characteristics and the ERP skill of the EPS at pentad mean scale.
 23. **Predictable patterns and predictive skills of monsoon precipitation in Northern Hemisphere summer in NCEP CFSv2 reforecasts** (Zuo et al.): studied the predictable patterns and predictive skill of Northern Hemisphere summer monsoon precipitation using 1983-2010 CFSv2 reforecasts, and evaluated possible connections between predictable patterns and global SST.
 24. **Calibration and combination of dynamical seasonal forecasts to enhance the value of predicted probabilities for managing risk** (Dutton et al.): applied two calibration methods to seasonal surface temperature forecasts of the US National Weather Service, the European Center for Medium Range Weather Forecasts, and to a World Climate Service multi-model ensemble created by combining those two forecasts with Bayesian methods.

To view the topical collection, go to: <http://link.springer.com/journal/volumesAndIssues/382>
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