International workshop on seasonal to decadal prediction
Toulouse, France, 13-16 May, 2013

Assessment of CFS forecast skill over the Pacific Islands A processes based study

Hanna ANNAMALAI

IPRC/SOEST, University of Hawaii, USA, hanna@hawaii.edu
Arun Kumar, Jan Hafner and Hui Wang
Presenter : Hanna Annamalai

Our goal is to develop a dynamical precipitation system for all US affiliated Pacific Isands (USAPI) based on Coupled Forecast System (CFS). In the present research, the 24-member ensemble hindcast performed with CFSv2 (CFS version 2) has been examined to document the skill scores over the USAPI, and to assess its improvements compared to CFSv1 (CFS version 1). The hypothesis that successful prediction of precipitation over the USAPI relies on the successful prediction of ENSO-related SST and rainfall along the equatorial Pacific is first assessed. CFSv2 shows clear improvement in ENSO prediction compared to CFSv1. Over the USAPI, except during boreal summer over the west Pacific islands, deterministic skill measured by anomaly correlation coefficient (ACC) is high and useful for leads upto 3 months. The persistence of dryness during warm ENSO events demonstrates high predictability. The ability of the model in forecasting rainfall vs large-scale circulation anomalies at various leads will be discussed. In addition, we will also discuss the systematic errors in the model that need improvements.

We employ moisture and moist static energy budget diagnostics to understand the moist and radiative processes that are responsible for dryness or wetness during ENSO and non-ENSO years. We will show that in most instances the successful prediction of CFSv2 is for correct reasons that are supported by process oriented diagnostics.