## CHFP2: A coupled multi-seasonal forecast system for Canada

<u>William Merryfield</u><sup>+</sup>; Woo-Sung Lee; Viatcheslav Kharin; George Boer; John Scinocca; Greg Flato <sup>+</sup> Canadian Centre for Climate Modelling and Analysis, Canada Leading author: <u>bill.merryfield@ec.gc.ca</u>

A new multi-seasonal climate prediction system for Canada, developed under the second Coupled Historical Forecasting Project (CHFP2), is described. The CHFP2 system combines ensemble forecasts from the CanCM3 and CanCM4 versions of CCCma's coupled global climate model. Initialization is through a set or statistically equivalent assimilation runs, one for each ensemble member, that begin from different initial conditions but assimilate the same data products in the years leading up to the forecast. These include 3D atmospheric temperatures, winds and specific humidity, sea ice concentration, and sea surface temperature. Subsurface ocean temperatures are assimilated through a separate, off-line step which includes a salinity adjustment to preserve the water column T-S relation. Forecast shills are assessed from a set of 12-month forecasts, initialized at the start of each month over 1979-2008, which comprise CCCma's contribution to the WCRP Climate-system Historical Forecast Project (CHFP). Prediction skills exceed those of Environment Canada's previous four-model, two-tier operational system, and extend the range of dynamical predictions from four to 12 months. ENSO prediction skills remain appreciable throughout the 12-month forecast period, and are compared with those from other centres. The CHFP2 system is scheduled to begin providing Environment Canada's operational multi-seasonal predictions in late 2011.