Bill
Merryfield
ECCC
Slava Kharin, Woosung Lee, John Scinocca and Reinel Sospedra-Alfonso
Oral
(Virtual Talk)
A longstanding issue for subseasonal and longer time scale predictions from dynamical models is that model systematic errors cause biases to develop as the model solutions drift from the climatology of the observations used to initialize them toward the intrinsic climatologies of the models. This necessitates estimating and applying lead time-dependent bias corrections that are usually (as a first approximation) assumed to be stationary from year to year. Because these biases distort the simulated Earth system state and associated physical processes, they are likely to negatively affect the skill of the predictions, although such influences are challenging to quantify.

The preferred solution is to improve models so that these systematic errors are eliminated, or at least reduced. However, such progress while steady has been slow, so drifts and biases in model-based predictions are likely to remain appreciable for the foreseeable future. A pragmatic alternative approach is to estimate systematic errors in physical tendencies from assimilation increments and apply corrections to the tendencies from the model equations during forecast runs. This approach has been
implemented for the atmosphere and ocean components of a version of CCCma's CMIP6 model CanESM5 used in ECCC's new CanSIPSv3 seasonal prediction system. This presentation describes the procedure used to derive the run time bias corrections in CanESM5, together with associated reductions in model biases and improvements in skill.
Presentation file
Merryfield-William.pdf
Meeting homepage
S2S Community Workshop
Download to PDF