Geophysical Research Abstracts
Vol. 21, EGU2019-6451, 2019
EGU General Assembly 2019

A statistical correction strategy with a self-organizing map to improve seasonal prediction of sea surface temperature

Joong-Bae Ahn and JoonLee Lee
Pusan National University, Division of Earth Environmental System, Busan, Korea, Republic Of (jbahn@pusan.ac.kr)

In this study, a new statistical strategy to improve the long-term prediction skill of a numerical model was developed. This new strategy begins by finding the major principal time series (PTs) in the observations using the self-organizing map (SOM) method. Next, values at the model grid points that are highly correlated with the observational PTs for each ensemble member are combined to yield a modelled PT. Finally, the model prediction is corrected using the model PTs from the previous step. Since the predictors for correction are objectively selected from among the signals found in model prediction, automatically considering their statistical correlation with predictands, the correction strategy is relatively free from the problem of selecting the proper predictor compared to conventional statistical correction methods. The new strategy is applied to the 12-month-lead sea surface temperatures hindcasted by the Pusan National University coupled general circulation model. After correction using the new strategy, temporal correlation coefficients and the hit rate are increased while normalized root mean square errors and the false alarm rate are decreased for each season and each lead time. The correction becomes more effective as the lead time increases. In particular, this correction effect is large over the region where the prediction skill without correction is apparently low, which implies that the biases leading poor prediction skills are effectively reduced by the new strategy.

References

Lee, J., and J. B. Ahn (2018) A new statistical correction strategy to improve long-term dynamical prediction. International Journal of Climatology.

Acknowledgements

This work was carried out with the support of "Cooperative Research Program for Agriculture Science & Technology Development (Project No. PJ01345205)" Rural Development Administration, Republic of Korea.