

EGU21-4059

<https://doi.org/10.5194/egusphere-egu21-4059>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Subseasonal forecasts of the northern Queensland floods of February 2019: Causes and forecast evaluation

Wayne Yuan-Huai Tsai, Mong-Ming Lu, Chung-Hsiung Sui, and Yin-Min Cho

National Taiwan University, Department of Atmospheric Sciences, Taipei, Taiwan (r06229002@ntu.edu.tw)

During the austral summer 2018/19, devastating floods occurred over northeast Australia that killed approximately 625,000 head of cattle and inundated over 3000 homes in Townsville. This disastrous event was attributed to a quasi-stationary monsoon depression over northeast Australia and the convection associated with MJO over the western Pacific (Cowan et al. 2019). We found that the unusual rainfall was a record-breaking subseasonal peak rainfall event (SPRE) based on the CMORPH daily precipitation data since 1998 (Xie et al. 2017). The SPRE is defined as the highest 15-day accumulative rainfall in the running 90-day windows (Tsai et al. 2020). Results of observational data analysis over the recent 21 years (1998–2020) of ERA-interim, OLR, and CMORPH datasets suggest that the northeastern Australian SPREs can be influenced by multiple large-scale drivers, in particular the MJO and equatorial Rossby waves. The occurrence time of the SPRE is associated with MJO activity, while the mean rainfall intensity is more closely associated with the equatorial Rossby waves. The circulation pattern of the SPREs can also be influenced by the equatorial Rossby waves. Using the hindcast data in S2S database we found that the models can capture the SPREs up to one week of the lead times. Characteristics of the activities of MJO and equatorial Rossby waves over the Indonesia-Australia region and their implication to the extended-range SPRE predictability will be discussed.

Key words: S2S prediction, Australian summer monsoon, subseasonal peak precipitation event, extreme rainfall

References:

Cowan, T., Wheeler, M.C., Alves, O., Narsey, S., de Burgh-Day, C., Griffiths, M., Jarvis, C., Cobon, D.H., Hawcroft, M.K., 2019. Forecasting the extreme rainfall, low temperatures, and strong winds associated with the northern Queensland floods of February 2019. *Weather Clim. Extremes* 26 (100), 232. <https://doi.org/10.1016/j.wace.2019.100232>.

Tsai, W. Y.-H., M.-M. Lu, C.-H. Sui, and P.-H. Lin, 2020: MJO and CCEW Modulation on South China Sea and Maritime Continent Boreal Winter Subseasonal Peak Precipitation. *Terr. Atmos. Oceanic Sci.*, DOI: 10.3319/TAO.2019.10.28.01

Xie, P., R. Joyce, S. Wu, S. Yoo, Y. Yarosh, F. Sun, and R. Lin, 2017: Reprocessed, Bias-Corrected CMORPH Global High-Resolution Precipitation Estimates from 1998. *J. Hydrometeorol.*, 18,

1617-1641, <https://doi.org/10.1175/JHM-D-16-0168.1>