CTB Seminar

10:00-11:00am EST, 9 May 2016

NOAA Climate Test Bed

Seminar Series

Speaker:

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Time:

10:00-11:00am EST, 9 May 2016

Location:

NOAA Center for Weather and Climate
Prediction Conference Room 2890
5830 University Research Court
College Park, MD 20740

Remote Access:

https://www1.gotomeeting.com/join/714576893
Meeting ID: 714-576-893
Conference call: 1-877-680-3341
Passcode: 858747

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Linkage between the Summer Indian Ocean SST and the Decay of ENSO Events

ABSTRACT

ENSO affects the tropical Indian Ocean (TIO) SST in winter-spring of ENSO decay years through an ENSO-induced 'atmospheric-bridge' and subsequent air-sea coupling processes. This study reports that, on top of the long-term warming trend of Indian Ocean, the Indian Ocean Basin (IOB) SST also exhibits significant inter-decadal variabilities, particularly for the summer IOB. The physical linkage between the summer SST anomalies over the TIO and the timing of ENSO decay phase is further investigated. Multi-source data are used to distinguish 'later-decay' from 'normal-decay' El Niño/La Niña events, and then to examine the changes in various thermodynamic and dynamic processes due to later-decay ENSO. The results show that, at both the interannual and interdecadal timescales, variability of the summer IOB SST is intimately related with the seasonal timing of ENSO decay phase. Specifically, significant warmer/colder SST anomalies in the spring TIO can persist into summer only in later-decay El Niño/La Niña years. Most of the ENSO-induced atmospheric-bridge-related processes contribute positively to the TIO SST changes in summer due to later-decay of ENSO, as they do in spring during normal-delay ENSO year. The exceptions are the surface wind-evaporation-mechanism (WEM) and sensible heat-flux anomalies in summer, which always contribute negatively to the summer SST anomalies over most parts of the TIO. The negative contributions from these two processes in summer exist no matter whether there is a weakening or strengthening surface wind due to later-decay of ENSO events. Generally, the presence of five later-decay El Niño events after the 1970s is mainly responsible for the observed interdecadal summer TIO warming in recent decades.

References

Ren, R.-C., S.Y. Sun, Y. Yang and Q. Li, 2016: Summer SST anomalies in the Indian Ocean and the Seasonal timing of ENSO decay phase. *Climate Dynamics*, DOI: 10.1007/s00382-015-2935-0.

Li, Qian, R.-C. Ren*, M. Cai and G. X. Wu, 2012: Attribution of the summer warming since 1970s in Indian Ocean Basin to the inter-decadal change in the seasonal timing of El Niño decay phase. *Geophys. Res. Lett.*, **39**, L12702, 5 PP., 2012, DOI: 10.1029/2012GL052150.