Abstract Details

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Title: Synoptic Disturbances over the Western Maritime Continent Region c
Boreal Winter

Abstract:

During boreal winter, the Maritime Continent is a region of deep cum
convection and heavy precipitation systems that play a major role in
global- and regional-scale processes. Over the western part of this re
the synoptic-scale Borneo vortex and northeast cold surge and the
intraseasonal Madden Julian Oscillation (MJO) contribute to the variat
deep convection. This work studies the impact on deep convection du
interactions among these three different motion systems. Furthermor
role of the unique topography of the region is examined with respect
variability in the synoptic-scale cold surge and Borneo vortex. The pri
data used in this study are the three-hourly Geostationary Meteorolo
Satellite (GMS) black-body temperature (Tbb) at 1° x 1° grids, and
once daily (00 UTC) NCEP/NCAR Reanalysis winds at 925 hPa at 2.5°
grids, for 21 boreal winters (December 1980 – February 2001). On t
synoptic scale, interaction of northeast winds with local topography a
dynamic response to the change in latitude contribute to turning of th
and localized patterns of deep convection. In days without a Borneo v
deep convection tends to be suppressed over the South China Sea an
Borneo and enhanced downstream over the landmasses on the weste
southern peripheries of the equatorial South China Sea. The pattern i
reversed in days with a vortex. The presence of a cold surge enhance
contrast. The surge also interacts with the Borneo vortex, in that the
is strengthened and the vortex center shifts from over the South Chir
to be located over the western coast of Borneo. The frequency of colc
and vortex days is reduced during periods when the MJO is present.
Composites of large-scale circulation and outgoing longwave radiatior
used to show that often the MJO-related circulation patterns oppose t
synoptic-scale cold surge and vortex circulations. Thus, a primary imp
the MJO is to inhibit weak cold surge events, which then produces a
secondary impact on the Borneo vortex via the previously established
interactions between the cold surge winds and the vortex.

Presentation Mode:

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