FEATURES OF THE CARIBBEAN LOW LEVEL JET

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ABSTRACT

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The Caribbean Low Level Jet (CLLJ) is shown to be a real and dominant climatological feature of the early summer Caribbean climate. It manifests as an intensification in the trades in the western Caribbean basin (70°W- 80°W) with an east-west axis along 15°N. It is confined to heights below 600 mb and has maximum wind speeds approaching 16 ms^{-1} near the surface.

The study uses statistical methods and the PRECIS regional climate model to investigate the CLLJ. The results indicate that there is variability in the strength and zonal extent of the CLLJ which can be related to zonal sea surface temperature (SST) gradients between the eastern equatorial Pacific and the north tropical and/or equatorial Atlantic. When the gradient is driven by the Pacific (as in an El Niño event) the CLLJ winds are intensified to the north and in its south-westernmost quadrant. When the winds are driven by the tropical north Atlantic there is uniform wind intensification about the jet axis.

The CLLJ is also linked to a precipitation maximum over the near waters and along the Caribbean coast of Central America (up to 16°N) during June and more so in July. There is evidence of variation at the northern extent of this wet

zone depending on the ocean basin forcing the SST gradient. The CLLJ is also linked to moderate drying in the main Caribbean basin. The PRECIS model predicts that this drying trend will persist in the future and associates increased CLLJ intensities with decreased late season rainfall.

Key words: Caribbean, low level jet, precipitation, sea surface temperature, ENSO