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Precipitation and atmospheric features over the Intra – Americas seas simulated by CPTEC/INPE AGCM

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OBJECTIVE

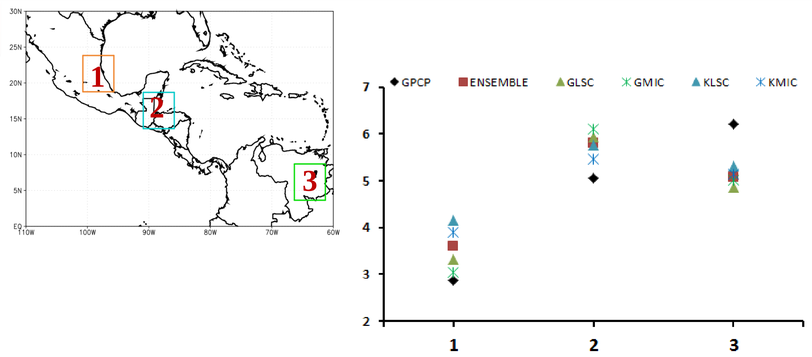
Analyze the Intra-Americas seas region features simulated by CPTEC/INPE AGCM compared to the observations.

MODEL

The CPTEC/INPE AGCM is a spectral model with T62 L28 resolution and the climate results consist on an ensemble of four integrations with Kuo and Grell convection schemes and large scale and microphysics precipitation. The analyzed period is from January 1980 to December 2010.

DISPERSION

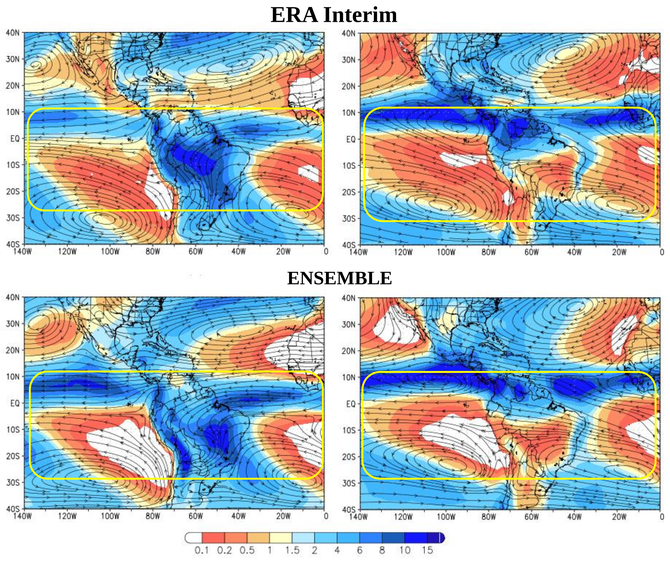
The dispersion among the members is shown for 3 areas The area 1 has the largest dispersion and the area 3 the smallest, although with larger bias.



PRECIPITATION AND ATMOSPHERIC FEATURES

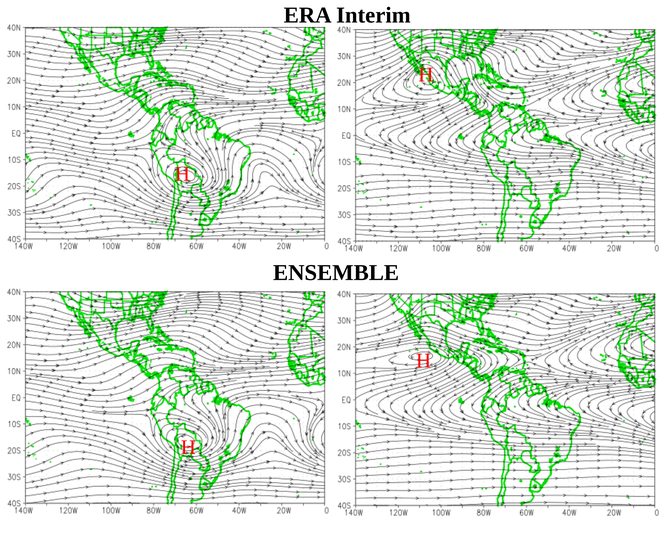
The model represents the seasonal features, as the convergence zones and the displacements of maximum precipitation to the North or South Hemispheres. However, there are some bias.

850hPa WINDS + PRECIPITATION
ERA Interim + GPCP

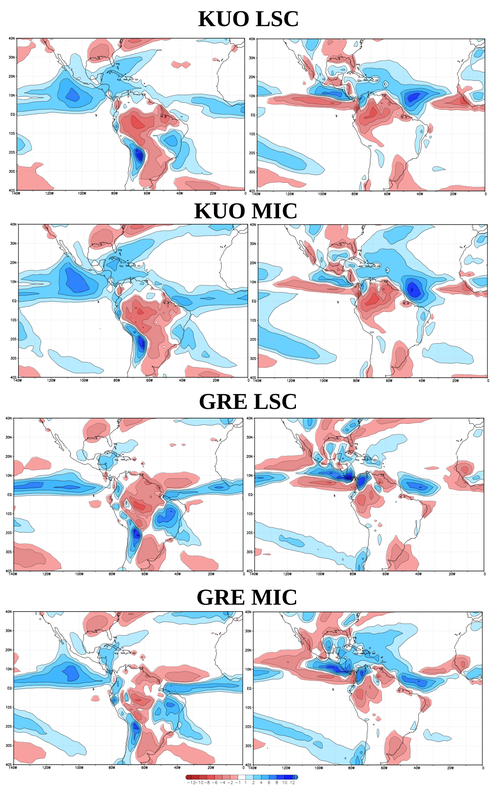


The model represents well the **Subtropical** Pacific and Atlantic Highs. The **Bolivian High and Mexican High** are identified in both sets.

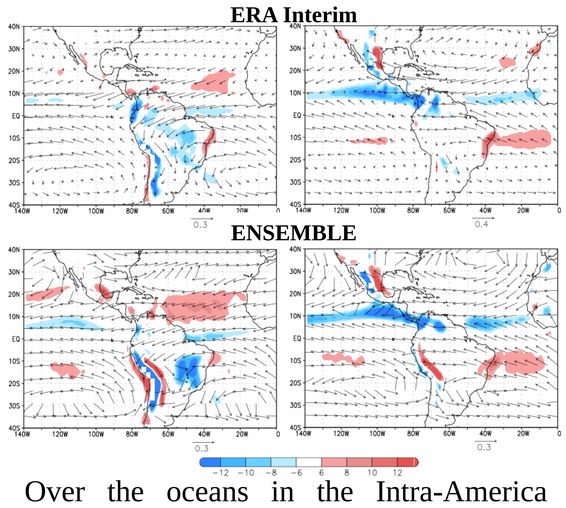
200hPa WINDS



PRECIPITATION



MOISTUDE FLUX
(1000-500hPa)

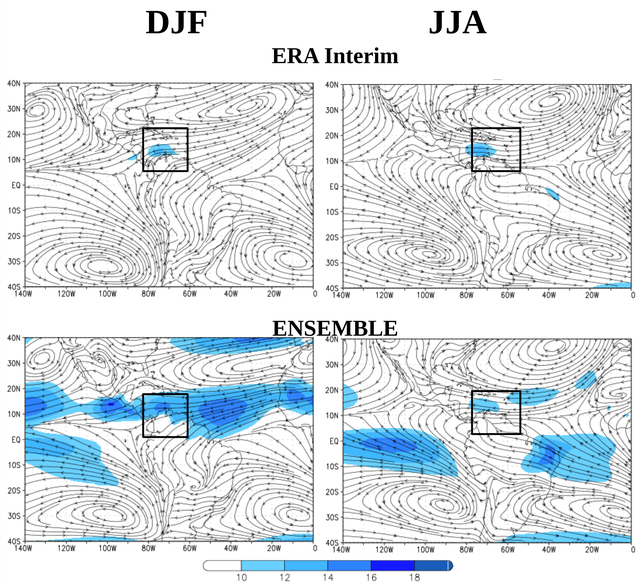


Over the oceans in the Intra-America region divergence of the moisture flux (shaded) and moisture flux (vector) is well represented by the model, but with a greater magnitude.

LOW-LEVEL JET

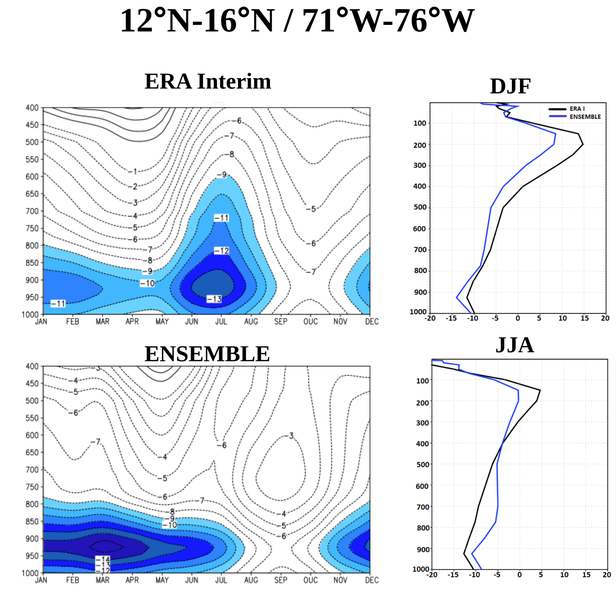
The Caribbean low level jet has a core in the western basin (70 °W–80 °W, 15 °N) and maximum horizontal wind speeds of up to 16m/s at the 925hPa (Whyte et al., 2008). Wind speeds begin increasing in May and reach maximum values in July. Thereafter, they weaken considerably by September (Amador, 1998).

925hPa WINDS



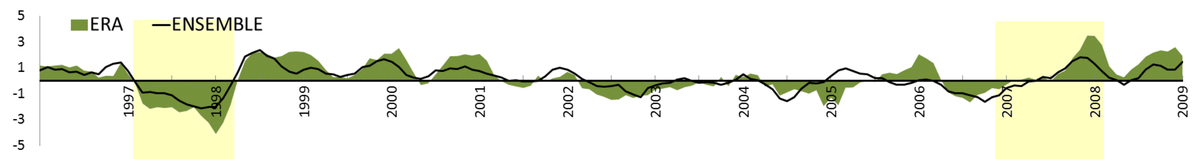
The model represents the **Caribbean low-level jet** (square in Figure) reasonably well in JJA. However, the winds are stronger in DJF.

ZONAL WIND IN THE AREA 12°N-16°N / 71°W-76°W



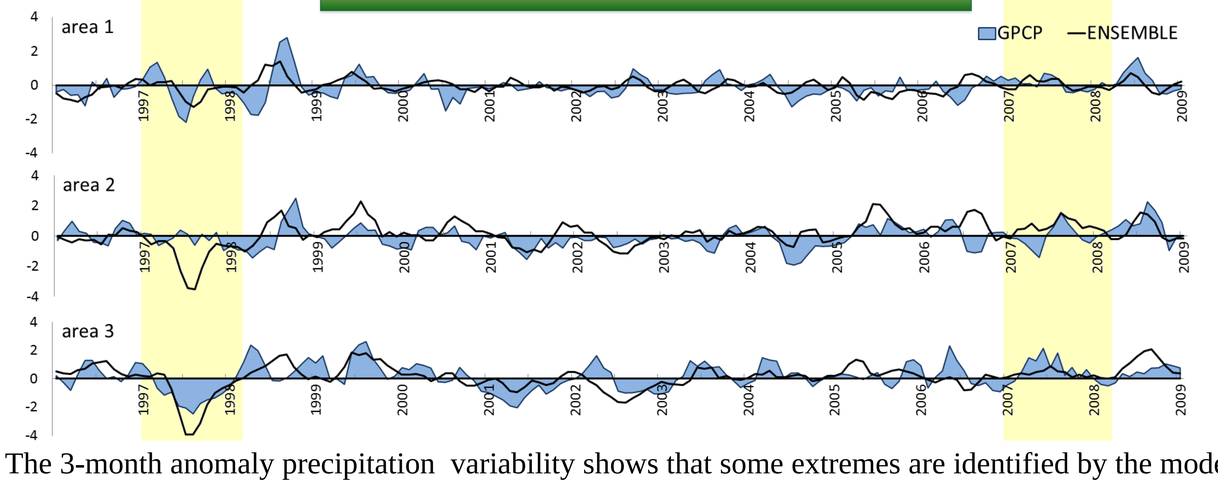
The level of maximum wind is well represented by the model. However, the vertical structure and the timing of maximum are not well simulated. In the model, the maximum winds are confined at low levels.

TIMES SERIES OF SOUTHERN OSCILLATION INDEX (SOI)



The 3 month average of model SOI follows the observation. The stronges 1997/1998 **EN** and 2007/2008 **LN** are well simulated.

PRECIPITATION ANOMALY



The 3-month anomaly precipitation variability shows that some extremes are identified by the model. 2007/2008 **LN** positive anomalies were simulated in the 3 areas, while in 1997/1998 **EN**, only area 3 was well represented.

CONCLUSION

The CPTEC/INPE AGCM shows the main seasonal features and annual cycle in the analyzed region, as well as the low and high levels circulation. Precipitation bias is larger in JJA in Central America and Caribbean region, and in DJF over South America. The position of the Caribbean jet is well simulated but the vertical structure and the annual cycle are different from the observations.

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