

# WAVETRAINS AND SOUTH AMERICA CLIMATE ON DECADAL SCALE

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**OBJECTIVE** In this study we seek to show the South America climate during distinct Pacific Decadal Oscillation phases, between 1970 and 2003, associating it with low frequency wave (Rossby waves) propagation throughout South Pacific. NCEP-NCAR, JRA-55, ERA-40 reanalysis and the GPCC precipitation datasets were used to identify the climate patterns. 1970-1976; 1977-1996 and 1997-2003 correspond to negative, positive and negative PDO phases, respectively.

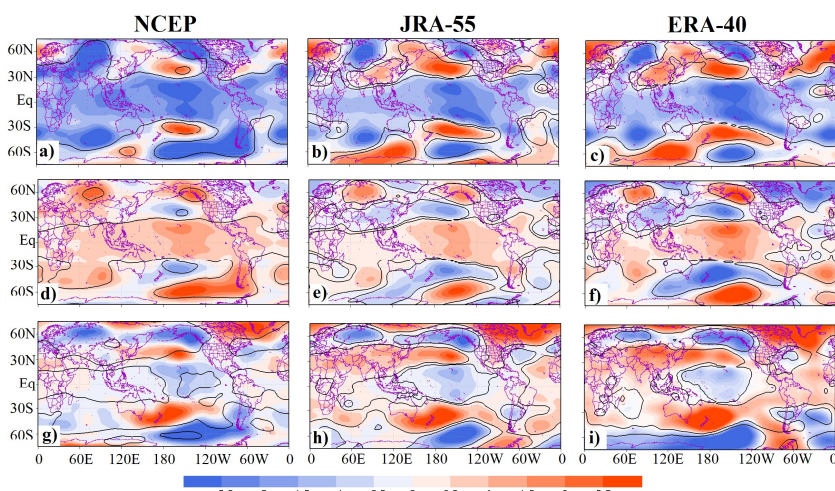


Fig 1 250 hPa geopotential height, smoothed by low-pass Lanczos filter, for the subperiods 1970-1976, 1977-1996 and 1997-2003, from NCEP-NCAR, JRA-55 and ERA40 reanalysis datasets. Statistical significant values above 95% are inside the black lines.

Karoly (1989) describes the wavetrains guides PSA

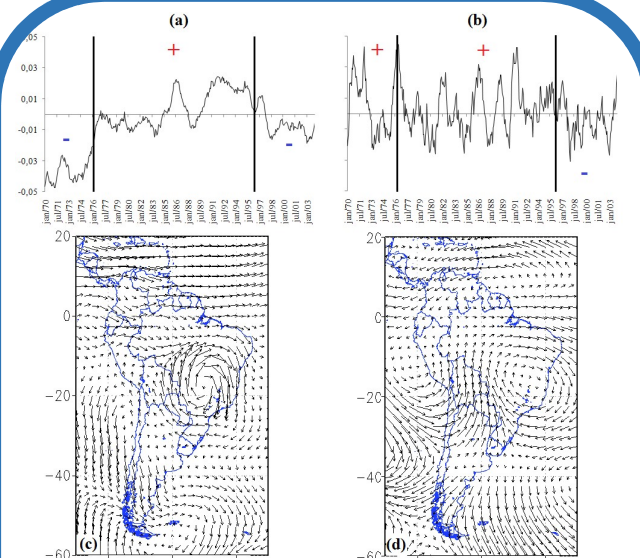


Fig 2 4th mode of EOF applied on (a) 850 hPa and (b) 250 hPa wind over South America, for the 1970-2003 period. The above panels indicate the time coefficients to the related mode. Similar to Mo and Nogués-Peagle (2001) patterns, but for a distinct period.

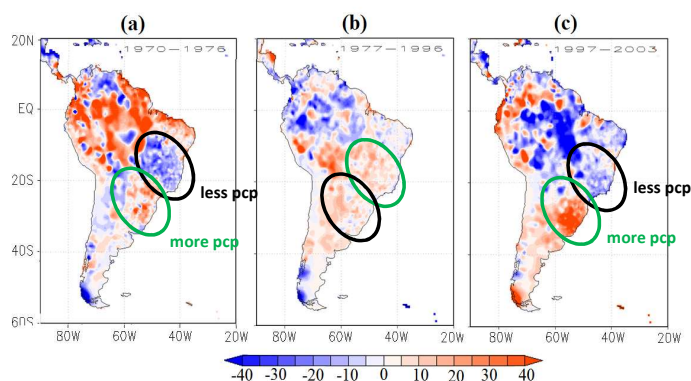


Fig 3 GPCC precipitation for the subperiods (a) 1970-1976, (b) 1977-1996 and (c) 1997-2003.

## CONCLUSION

It is possible to see the association between negative and positive PDO phases, from 1970 to 2003, respectively with anticyclonic and cyclonic anomalies centered over the central-eastern South America, both for low and high tropospheric levels. This implies in more and less moist air being taken from northern (and Amazonian) to southern South America, during negative and positive PDO phases. And also, more and less moist air being carried from tropical Atlantic to South America. Negative PDO phases are associated with positive precipitation anomalies over the southeastern South America (green surrounded) and negative anomalies to the north (black surrounded) of this region. The PDO positive phase is associated more or less with the opposite pattern. The association between circulation and precipitation anomalous patterns in decadal scales indicates that circulation patterns over eastern South America must influence the precipitation patterns.