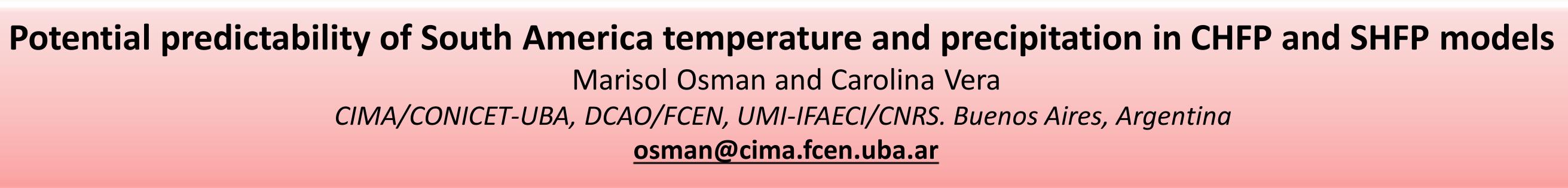


DJF



**GOAL:** Document the predictability of seasonal means of surface temperature and precipitation in South America during JJA and DJF

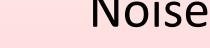
Data and methods: Ensembles of lead-1-month climate predictions of 17 models (each one with 10 members on average) from the WCRP/CHFP-SHFP Project are used. In particular, 5 different climate models which resolve the stratosphere (high-top models) and 12 models which do not (low-top models) are considered. An unbiased multi-model ensemble (MME) was constructed by pooling all models together. High-top and a low-top MME were also made. Predictability is computed as the ratio between the ensemble mean variance (or variance of signal) and the total variance, computed as the sum between signal variance and the ensemble spread (or noise variance).

TEMPERATURE PREDICTABILITY				
Signal	Noise	Predictability		T2m Potential Prodictability



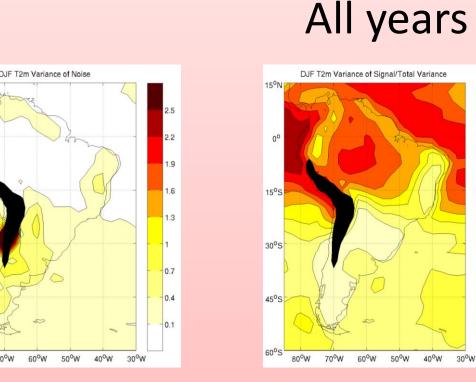
80°W 70°W 60°W 50°W 40°W

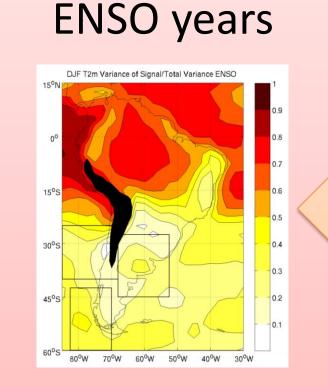
80<sup>0</sup>W 70<sup>0</sup>W 60<sup>0</sup>W 50<sup>0</sup>W



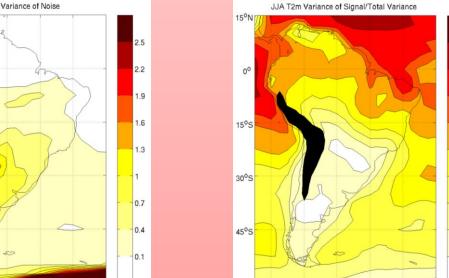
80°W 70°W

60°W



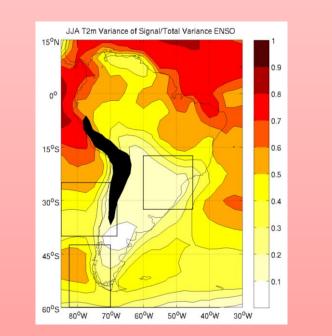


JJA T2m Variance of Signa JJA T2m Variance of Noise JJA



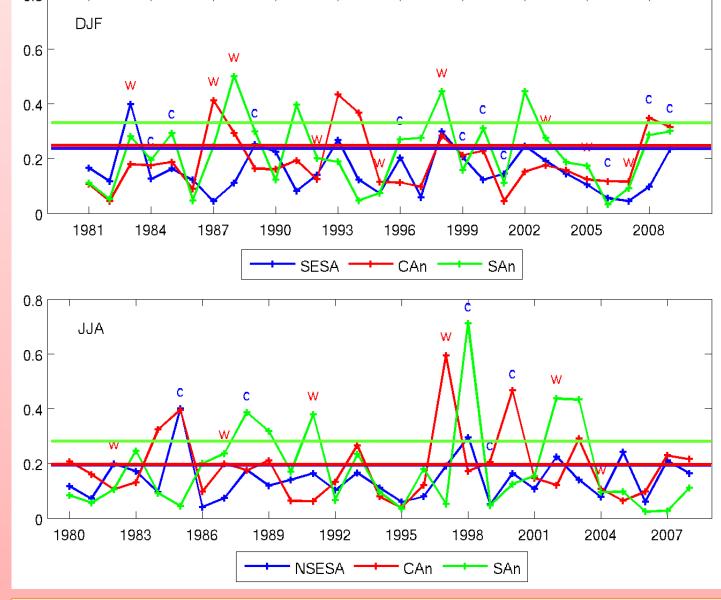
50°W 40°W 30°W

80°W 70°W 60°W



Temperature predictability is higher at tropical latitudes in both seasons and drops at midlatitudes. However, there is a local maximum in DJF over central Argentina. Predictability for ENSO years shows the same spatial pattern but with higher values in most of the continent.

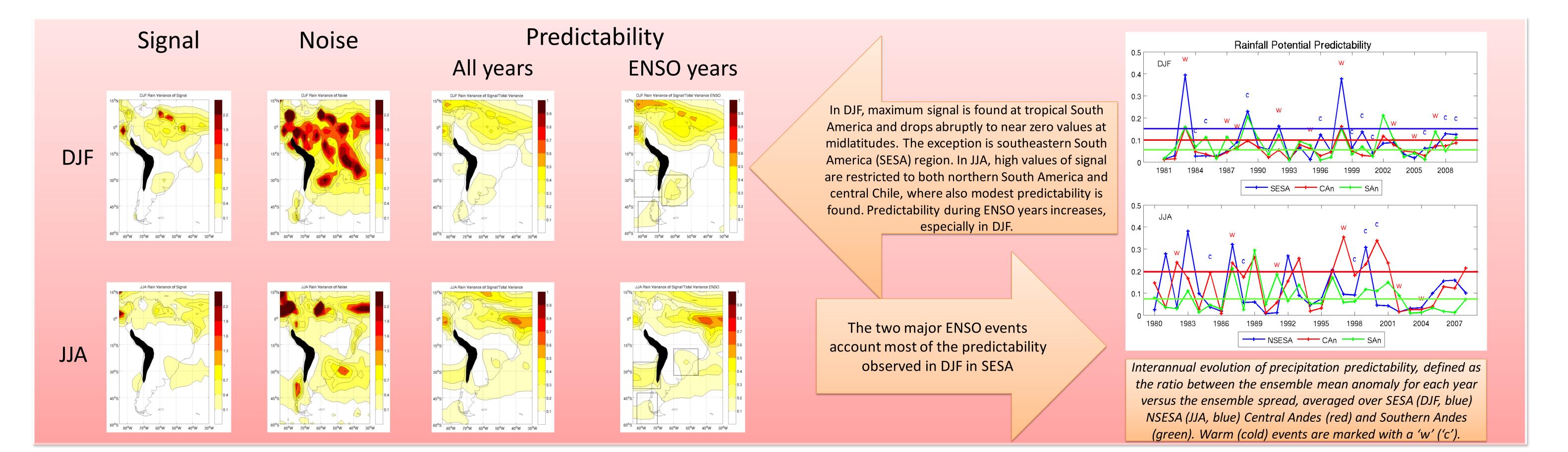
ENSO events contribute to increase predictability at extratropics. Southern Andes shows highest predictability values, especially during ENSO events



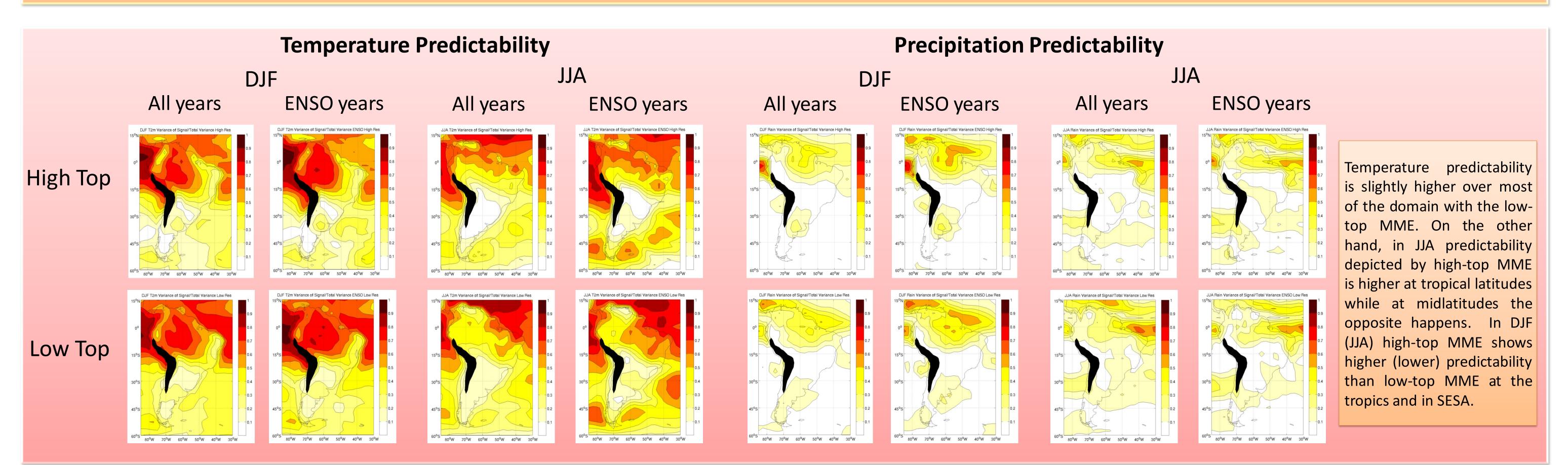
T2m Potential Predictability

Interannual evolution of temperature predictability, defined as the ratio between the ensemble mean anomaly for each year versus the ensemble spread, averaged over SESA (blue) Central Andes (red) and Southern Andes (green). Warm (cold) events are marked with a 'w' ('c').

## **PRECIPITATION PREDICTABILITY**



## IMPACTS OF IMPROVING STRATOSPHERE RESOLUTION IN CLIMATE MODELS ON REGIONAL PREDICTABILITY



**Conclusions:** The study shows as expected higher predictability levels at tropical South America than at the extra-tropics. However, regions like SESA and central Chile can exhibit moderate levels of predictability depending on the variable and season. In general, predictability slightly increases in ENSO years than in other years, while the contribution to predictability increase due to a better resolving stratosphere is not that evident.