Impact of increased horizontal resolution in coupled and atmosphere-only models of the HadGEM1 family upon the climate patterns of South America

Table 1. Configurations of the high resolution global climate model from the HadGEM family and the nomenclatures used hereafter to refer each simulation.

Short name of configuration	Resolution	Resolution in Atmosphere Lat x Lon	Resolution in km Atmosphere/ocean	Simulation period
Coupled models				
HadGEM	N96	1.25 x 1.875°	135/100 km	100 yr
HiGEM	N144	0.83 x 1.25°	90/30 km	100 yr
NUGEM	N216	0.55 x 0.83	60 km	22 yr
Atmosphere only models				
HadGAM	N96	1.25 x 1.875°	135 km	24 yr
HiGAM	N144	0.83 x 1.25°	90 km	24 yr
NUGAM	N216	0.55 x 0.83°	60 km	26 yr

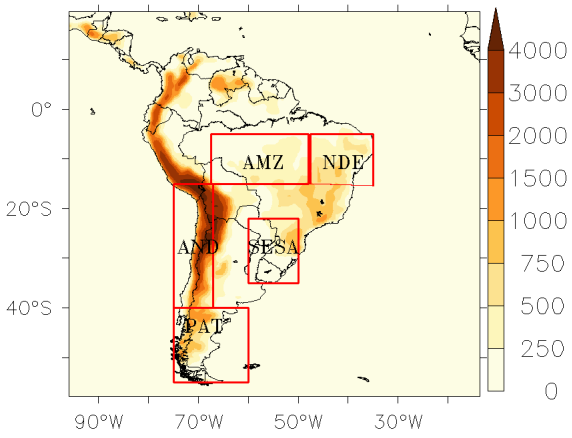

Figure 1. South America topography (shaded, in m) and location of five subdomains for annual cycle analysis.

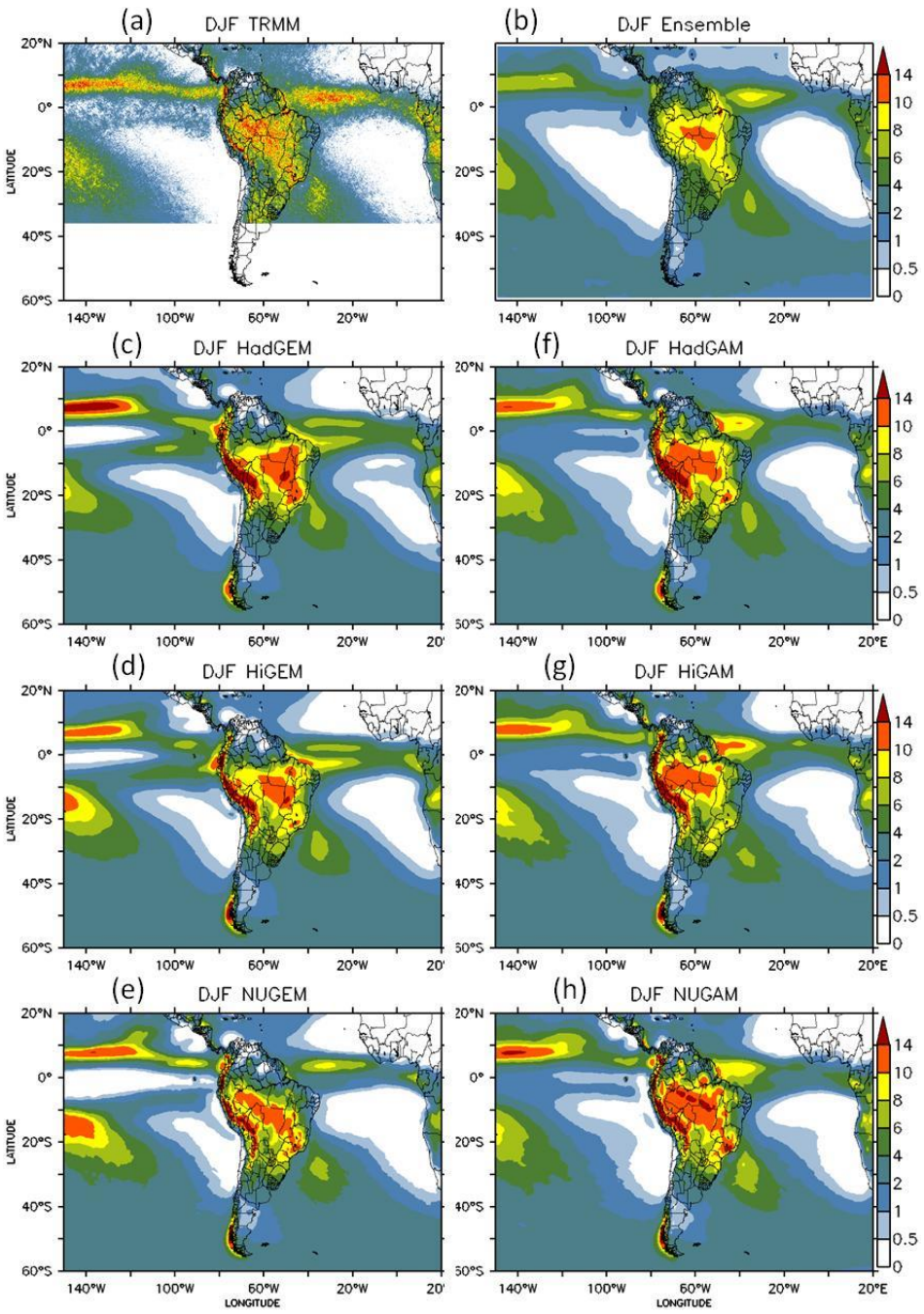

Figure 2. Seasonal climatology of precipitation (mm day^{-1}) in South America in the summer (DJF) from observations TRMM(a) and ensemble (b), coupled models HadGEM (c), HiGEM (d) and NUGEM (e) and atmospheric models HadGAM (f), HiGAM (g) and NUGAM (h).

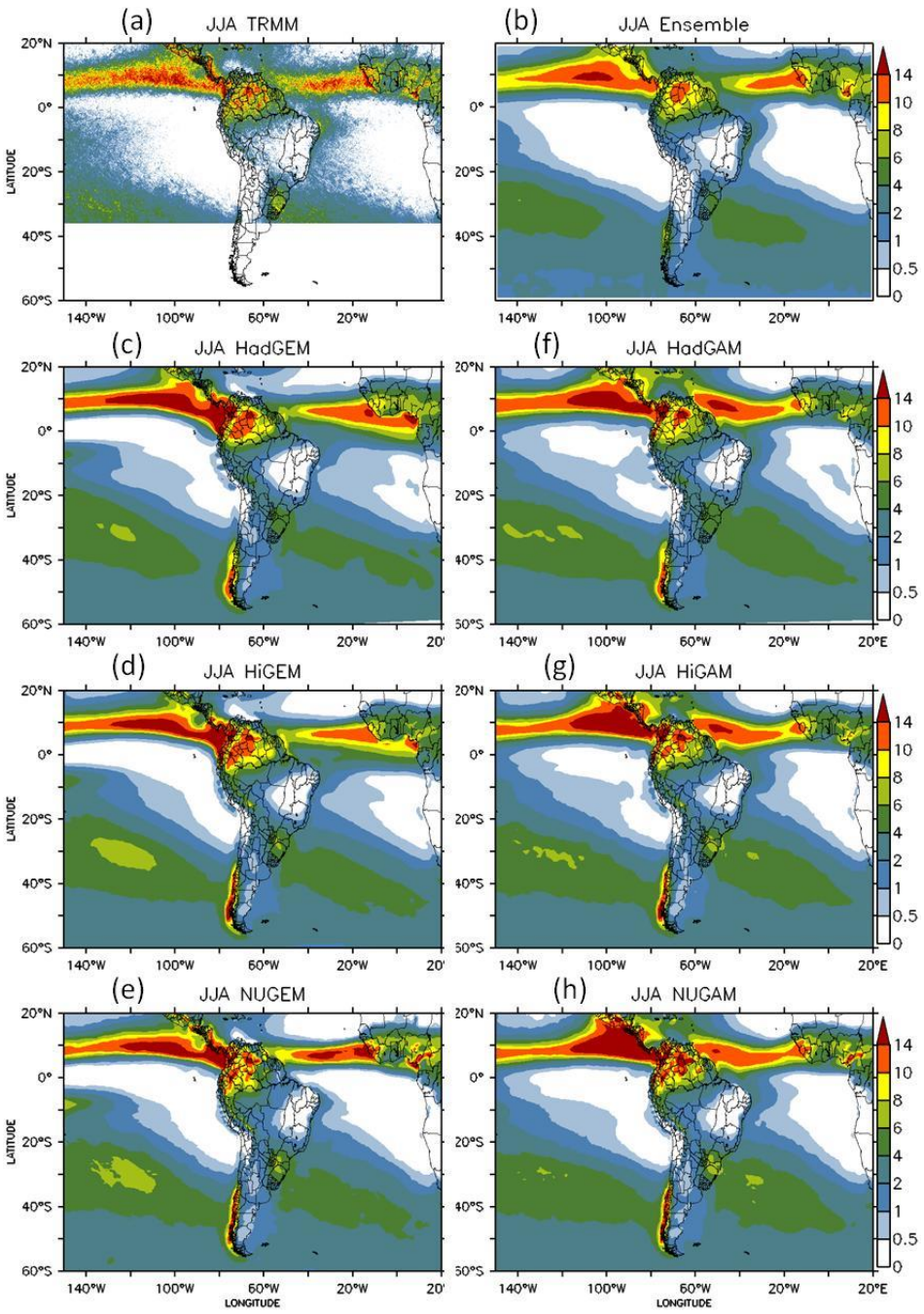

Figure 3. Seasonal climatology of precipitation (mm day^{-1}) in South America in the winter (JJA) from observations TRMM(a) and ensemble (b), coupled models HadGEM (c), HiGEM (d) and NUGEM (e) and atmospheric models HadGAM (f), HiGAM (g) and NUGAM (h).

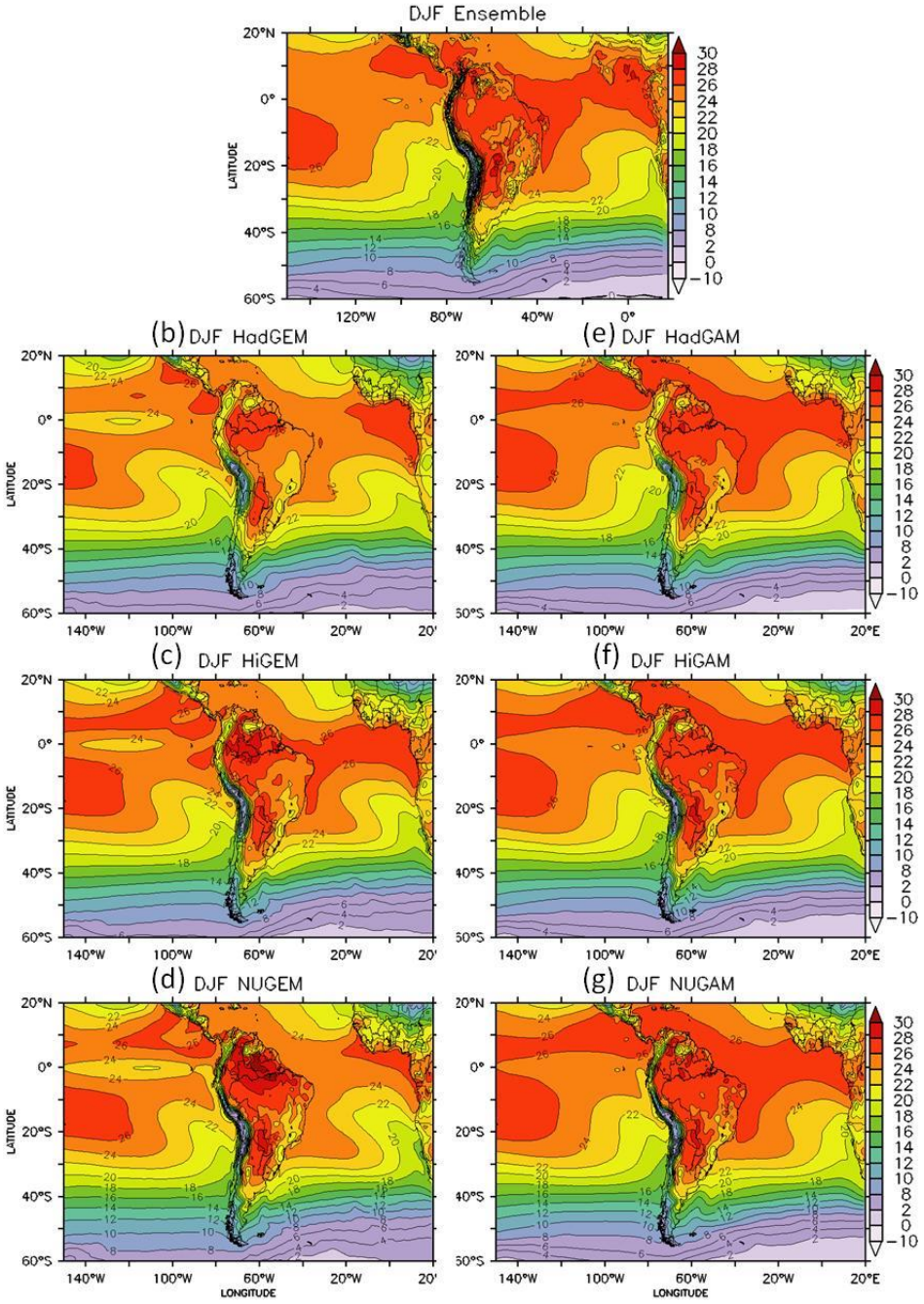

Figure 4. Seasonal climatology of temperature (°C) in South America in the summer (DJF) from ensemble (a), coupled models HadGEM (b), HiGEM (c) and NUGEM (d) and atmospheric models HadGAM (e), HiGAM (f) and NUGAM (g).

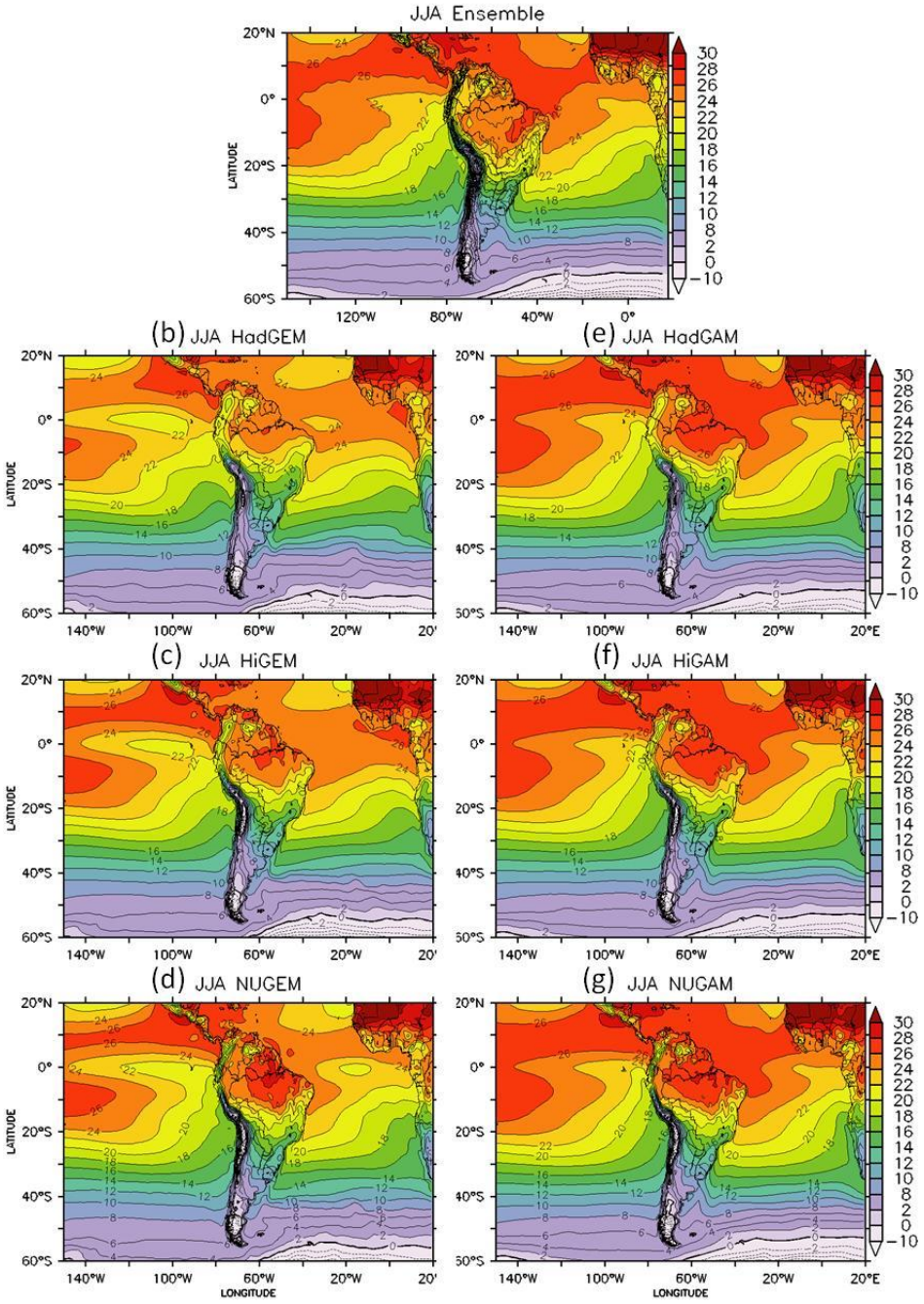

Figura 5. Seasonal climatology of temperature (°C) in South America in the winter (JJA) from ensemble (a), coupled models HadGEM (b), HiGEM (c) and NUGEM (d) and atmospheric models HadGAM (e), HiGAM (f) and NUGAM (g).

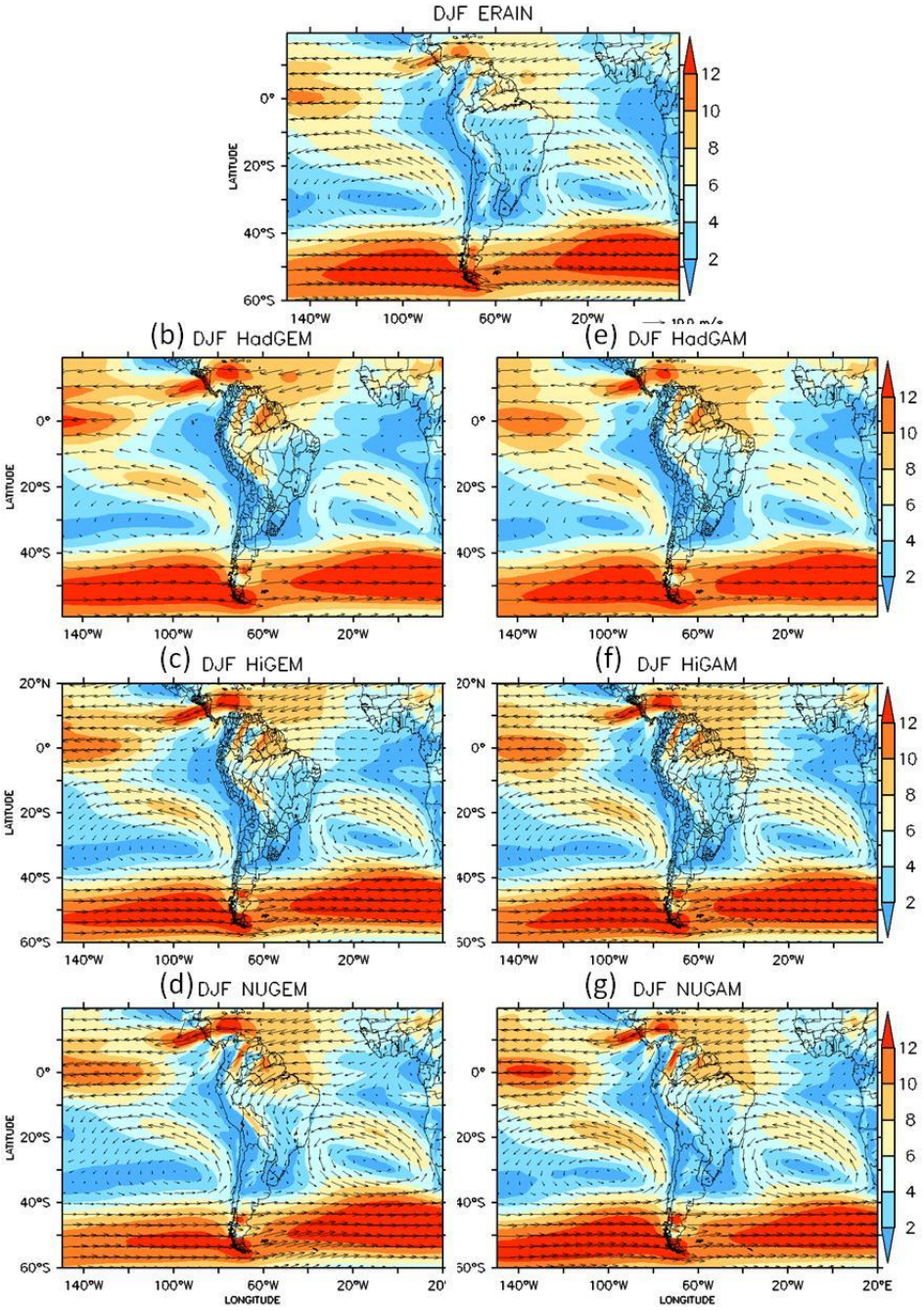

Figura 6. Seasonal climatology of wind at 850 hPa in South America in the summer (DJF) from ensemble (a), coupled models HadGEM (b), HiGEM (c) and NUGEM (d) and atmospheric models HadGAM (e), HiGAM (f) and NUGAM (g).

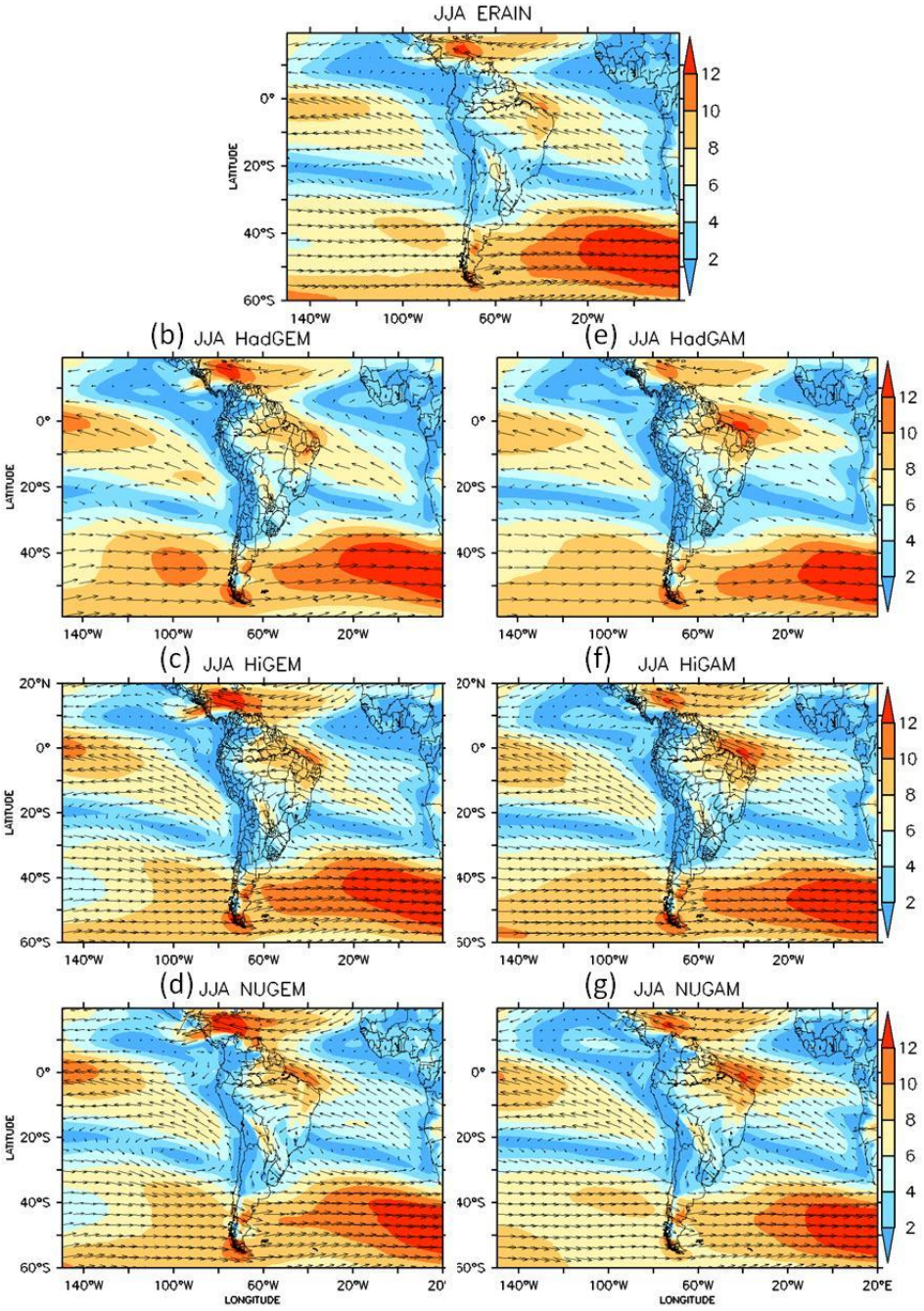

Figure 7. Seasonal climatology of wind at 850 hPa in South America in the winter (JJA) from ensemble (a), coupled models HadGEM (b), HiGEM (c) and NUGEM (d) and atmospheric models HadGAM (e), HiGAM (f) and NUGAM (g).

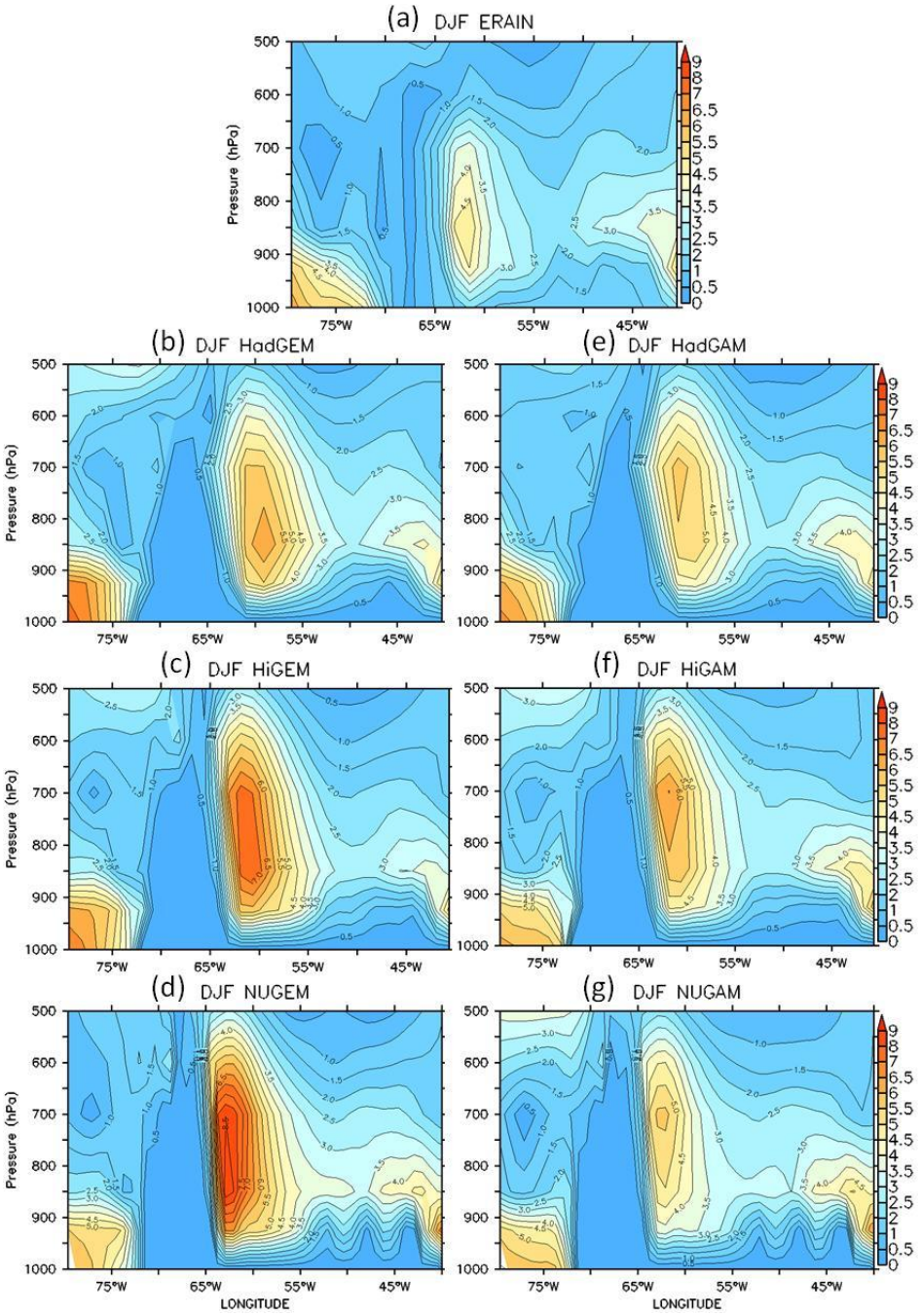

Figure 8. Vertical profile of wind at 17.5°S longitude in South America in the summer (DJF) from ensemble (a), coupled models HadGEM (b), HiGEM (c) and NUGEM (d) and atmospheric models HadGAM (e), HiGAM (f) and NUGAM (g).

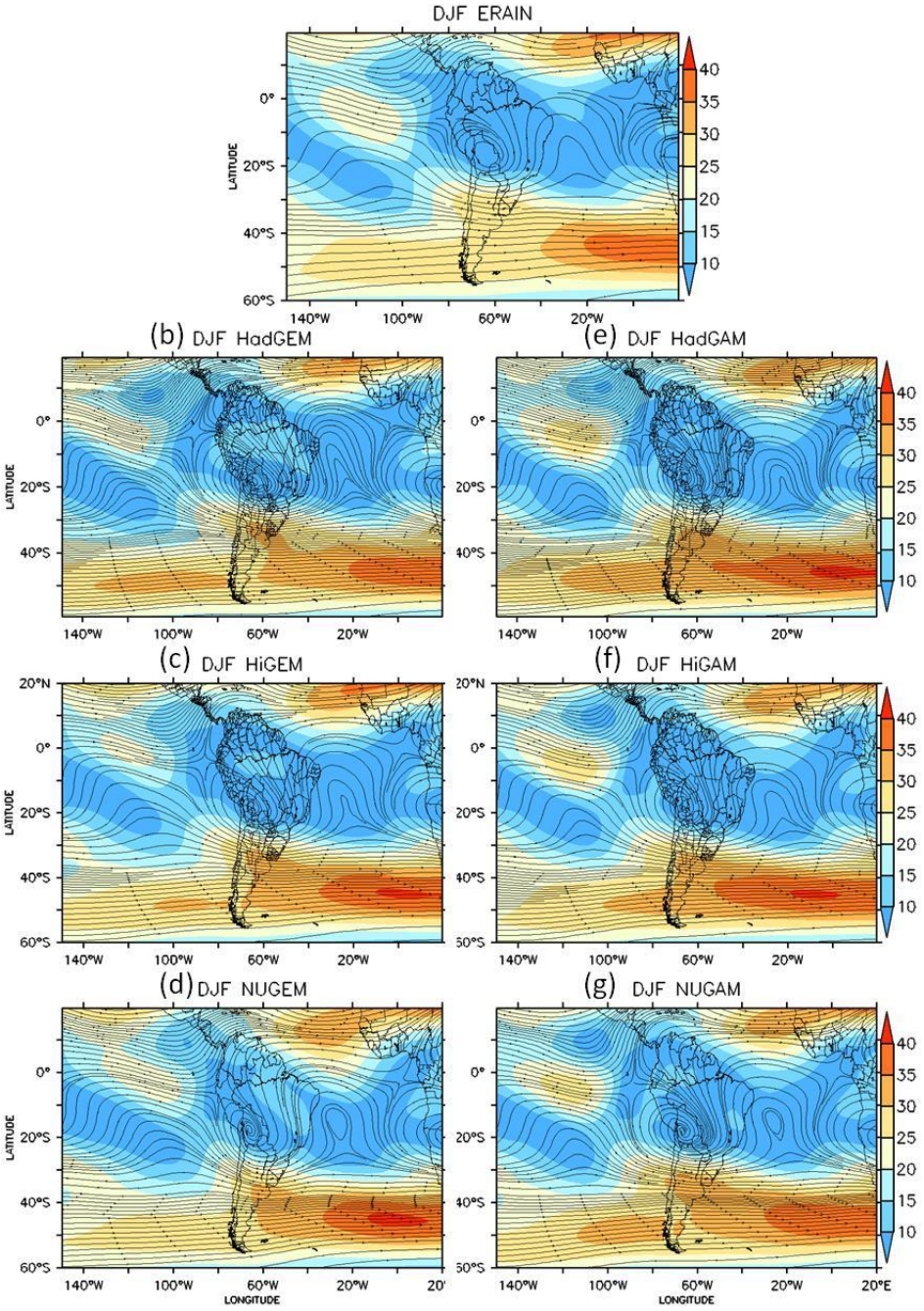

Figure 9. Seasonal climatology of wind at 200 hPa in South America in the summer (DJF) from ensemble (a), coupled models HadGEM (b), HiGEM (c) and NUGEM (d) and atmospheric models HadGAM (e), HiGAM (f) and NUGAM (g).

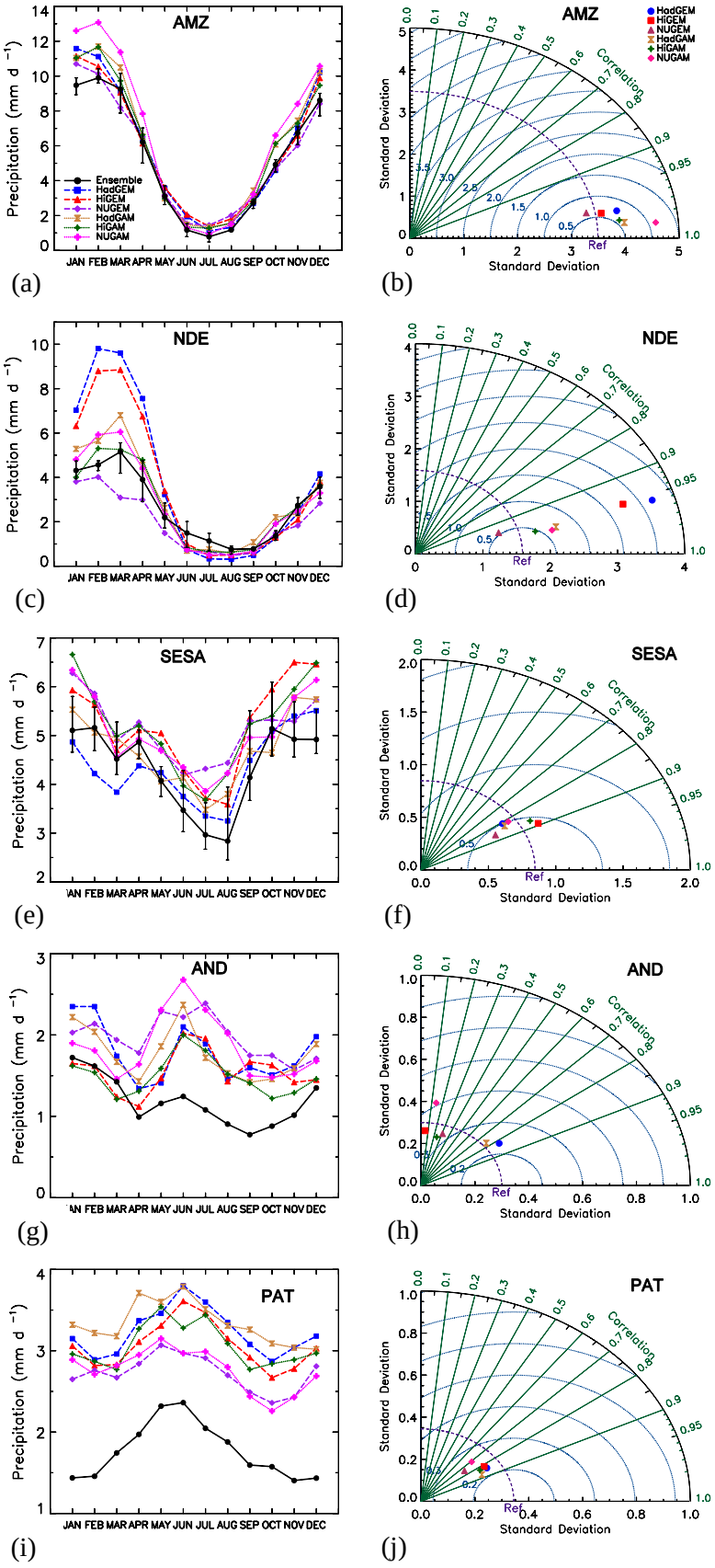

Figure 10. Annual cycle of precipitation (mm day^{-1}) (left column) and Taylor diagram (right column) for coupled (HadGEM, HiGEM e NUGEM) and atmospheric simulations (HadGAM, HiGAM e NUGAM) and observations ensemble.

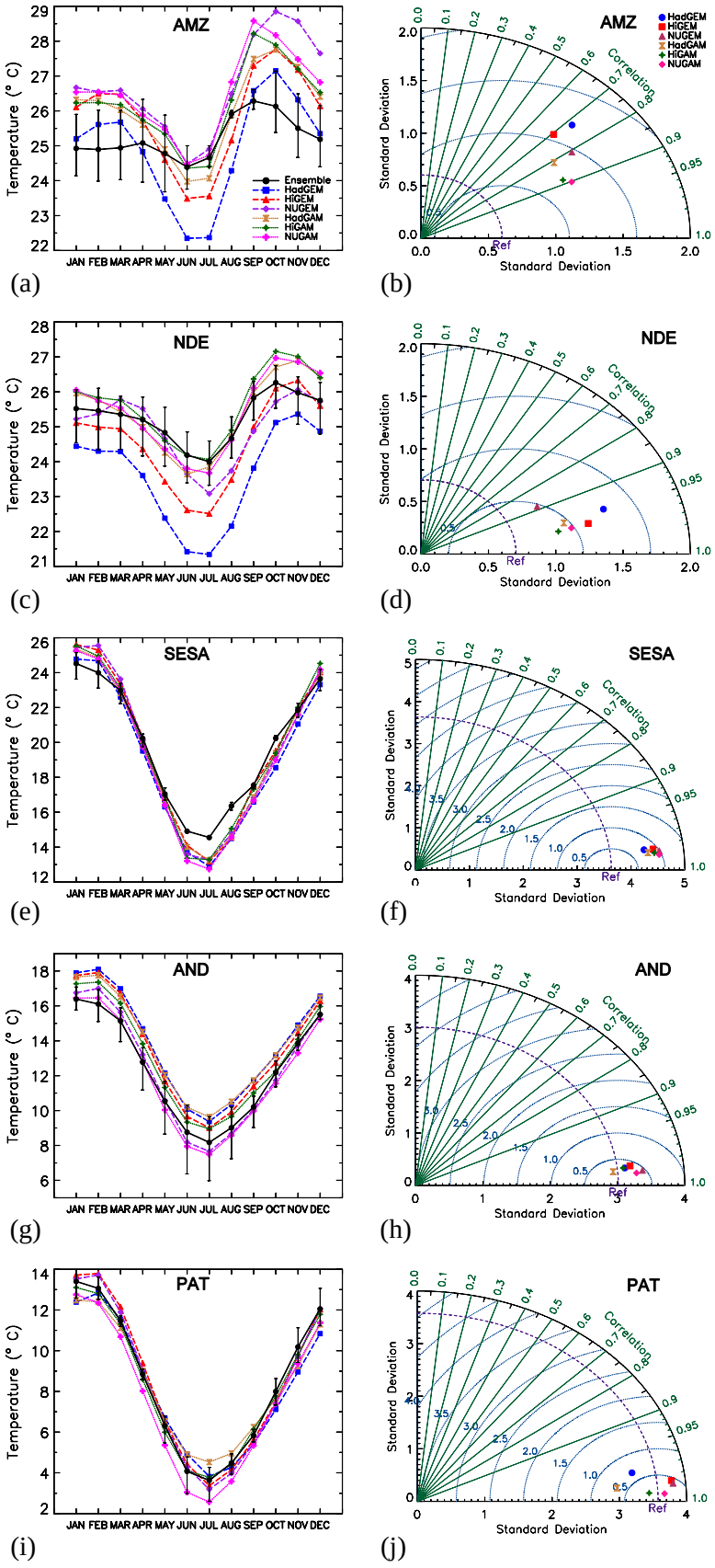

Figure 11. As in Figure 10, albeit for temperature.