

# Study of climate variability and future climate projections over the Southern Central Andes region through CMIP5 GCMs

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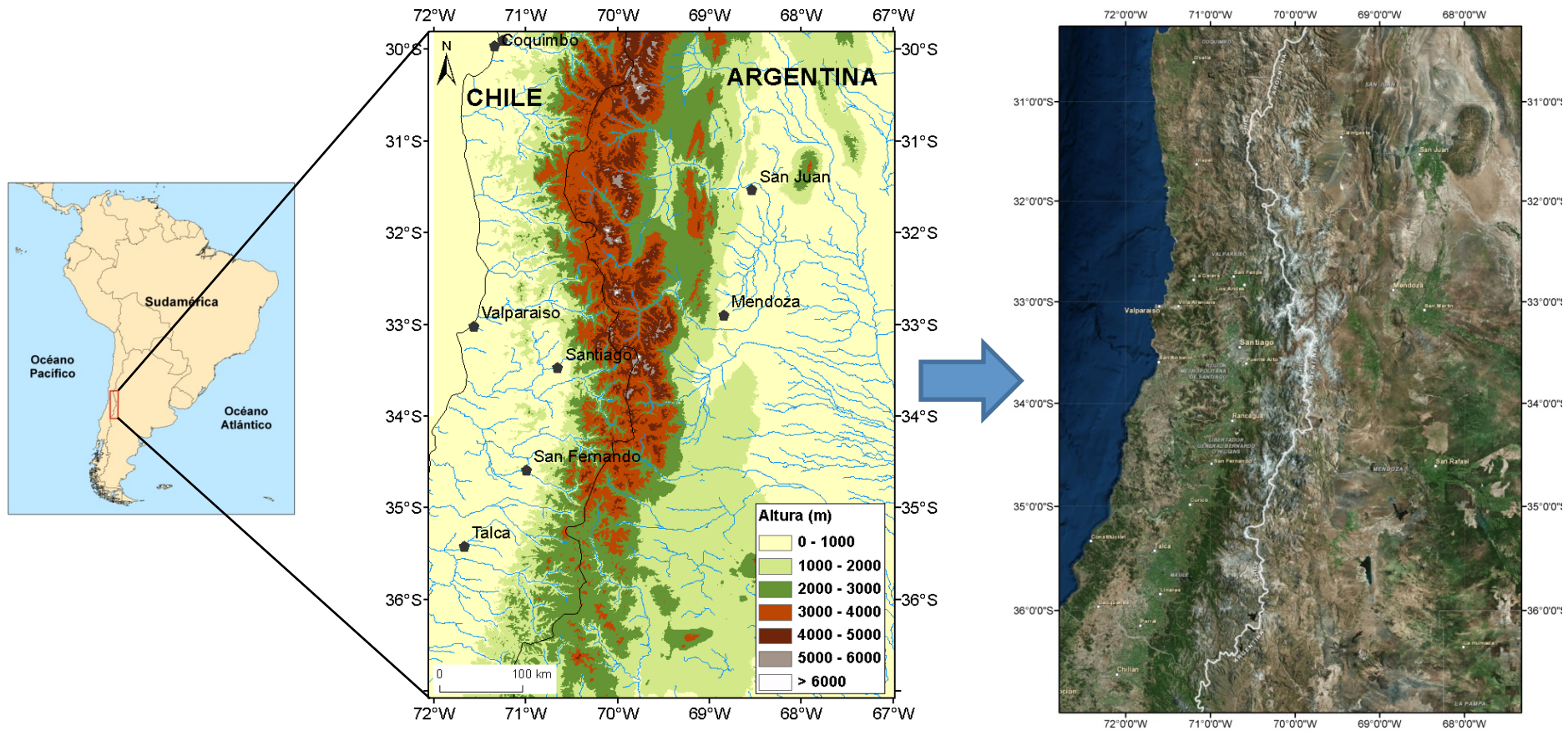
Facultad de Ciencias Exactas y Naturales

**UBA**EXACTAS

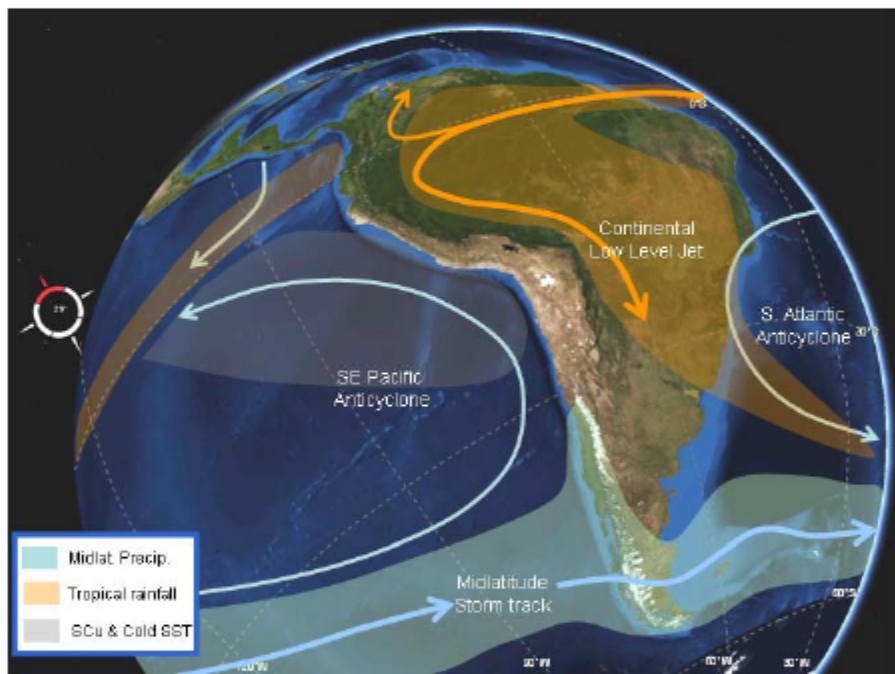


# STUDY REGION

Southern Central Andes : between Argentina and Chile 30-37°S

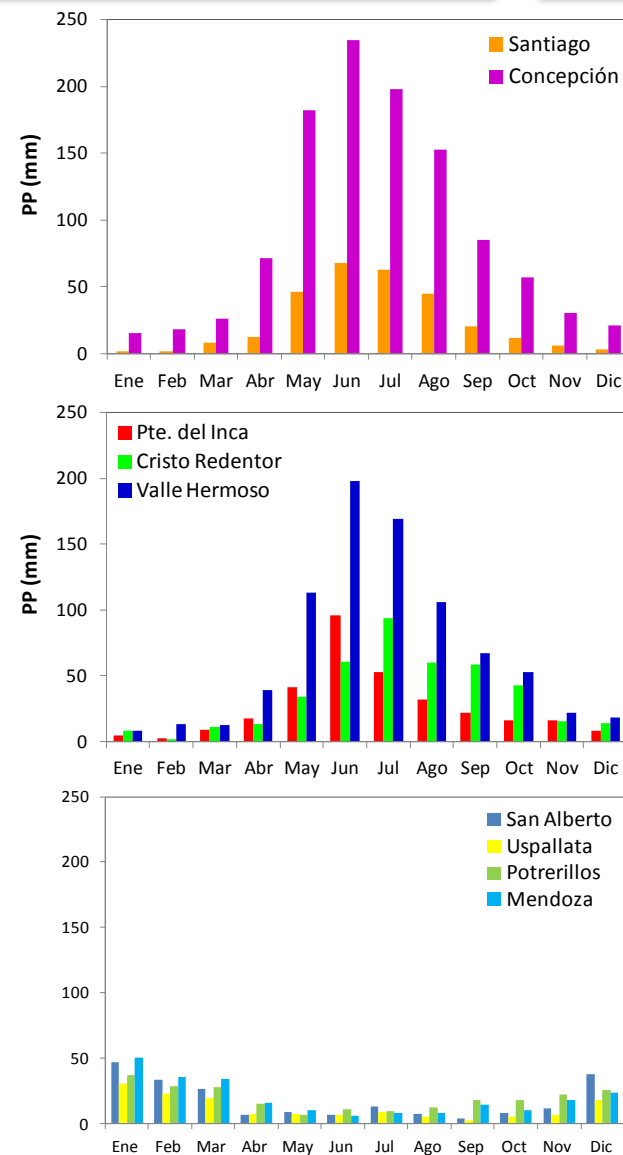


# CLIMATE OF THE REGION



**Fig. 3.** Schematics of the low-level atmospheric flow (roughly from surface to about 1.5 km a.s.l.) around the Andes cordillera. Also shown major climate features of South America.

Garreaud (2009)



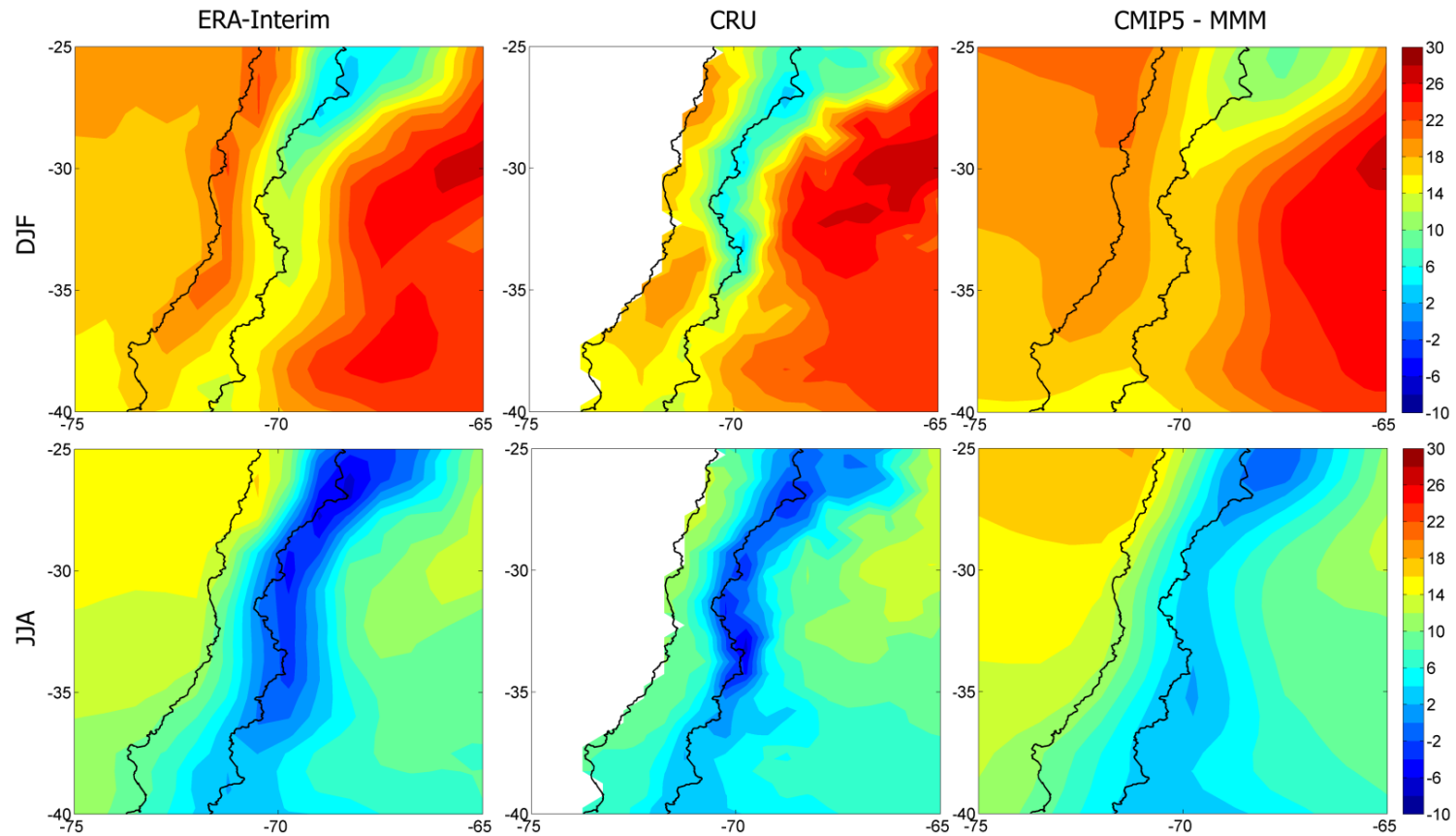
# CMIP5 GCMs

N ombre del modelo	Institución, País	Resolución (lon x lat)
ACCESS 1.0	CSIRO , Bureau of Meteorology, Australia	1.25° x 1.875°
ACCESS 1.3	CSIRO , Bureau of Meteorology, Australia	1.25° x 1.875°
BCC-CSM1.1 (m)	China Meteorological Administration, China	1.1° x 1.1°
CCSM4	NCAR, Estados Unidos	0.9° x 1.25°
CESMI (BGC)	NSF-DO E-NCAR, Estados Unidos	0.9° x 1.25°
CESMI (CAM5)	NSF-DO E-NCAR, Estados Unidos	0.9 °x 1.25°
CMCC-CM	Centro Euro-Mediterraneo per I Cambiamenti Climatici	0.75° x 0.75°
CNRM-CM5	Centre National de Recherches	1.41° x 1.41°
EC-EARTH	EC-EARTH Consortium, Europa	~1.1° x 1.125°
HadG EM2-CC	Met O ffice Hadley Center, Reino Unido	1.25° x 1.875°
HadG EM2-ES	Met O ffice Hadley Center, Reino Unido	1.25° x 1.875°
MIRO C4h	Meteorological University of Tokyo, Japón	0.5625° x 0.5625°
MIRO C5	Meteorological University of Tokyo, Japón	1.40625° x 1.40625°
MRI-CG CM3	Meteorological Research Institute, Japón	1.1° x 1.2°
MRI-ESM1	Meteorological Research Institute, Japón	1.1° x 1.2°

Mean horizontal resolution  
~1.3°

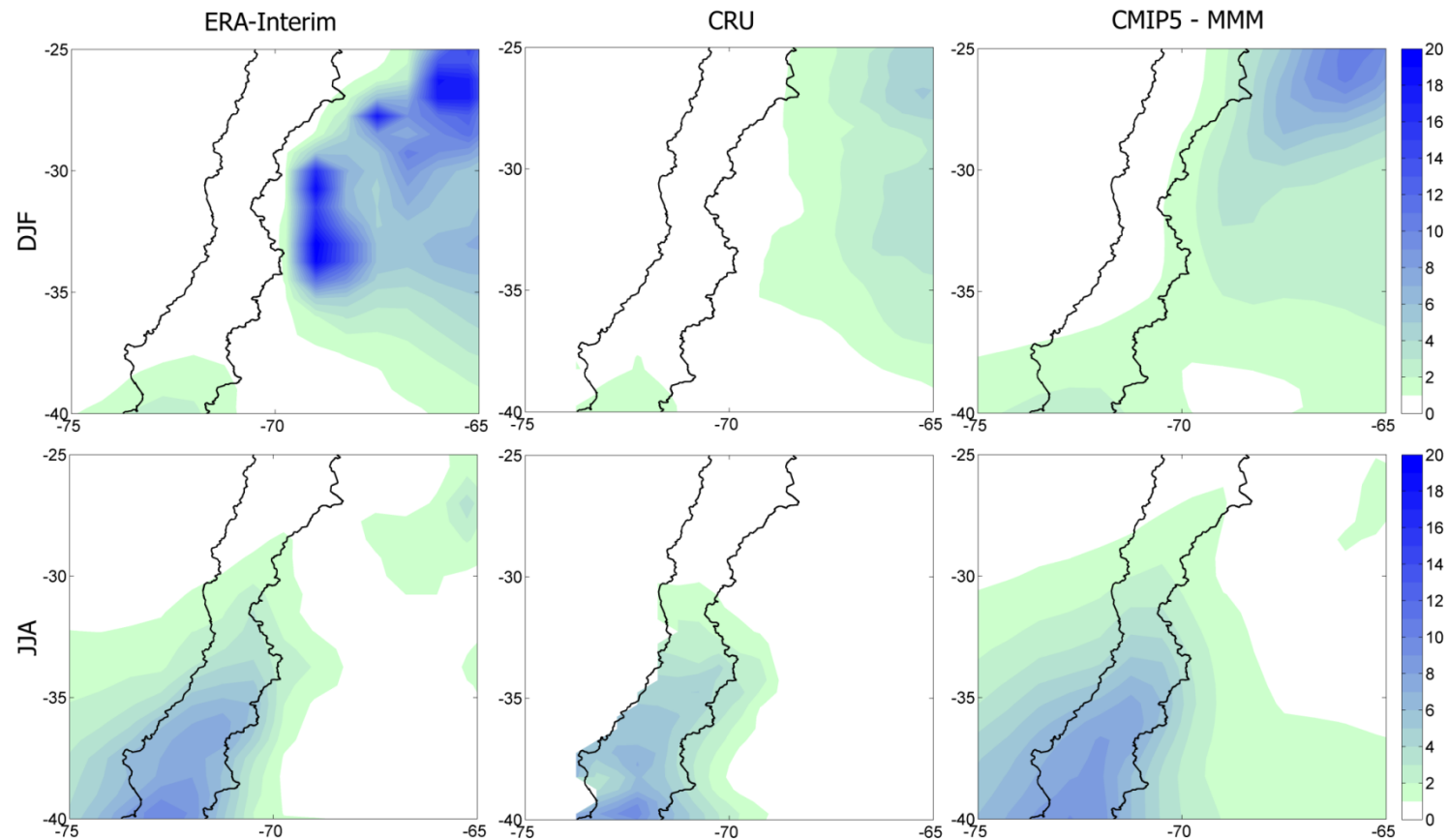
# VALIDATION OF GCMs - Temperature

Historical period - Temperature 1980-2005



# VALIDATION OF GCMs - Precipitation

Historical period - Precipitation 1980-2005



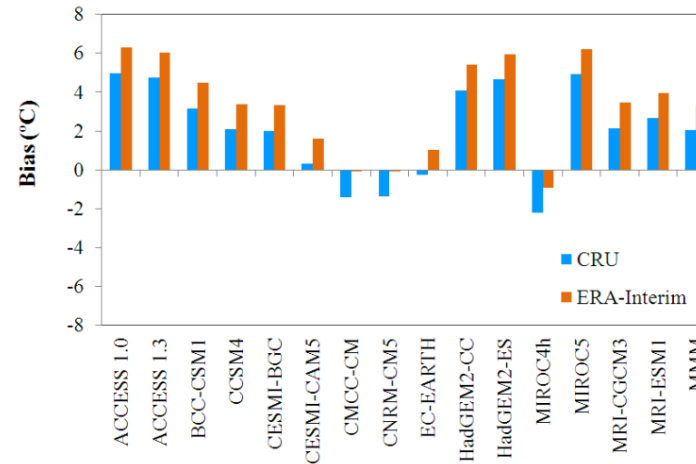
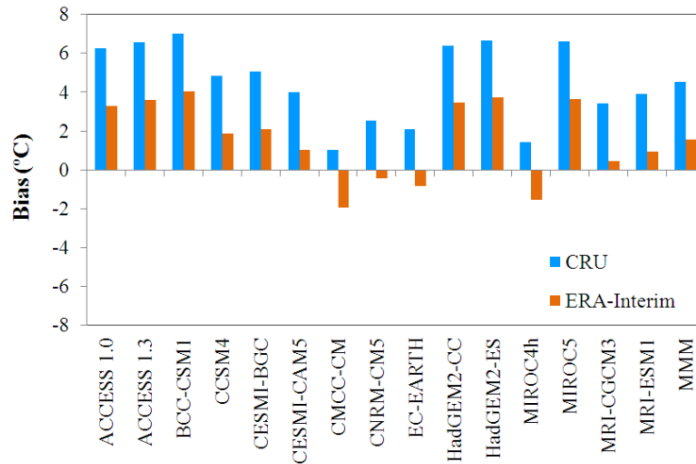


# VALIDATION OF GCMs – Seasonal bias

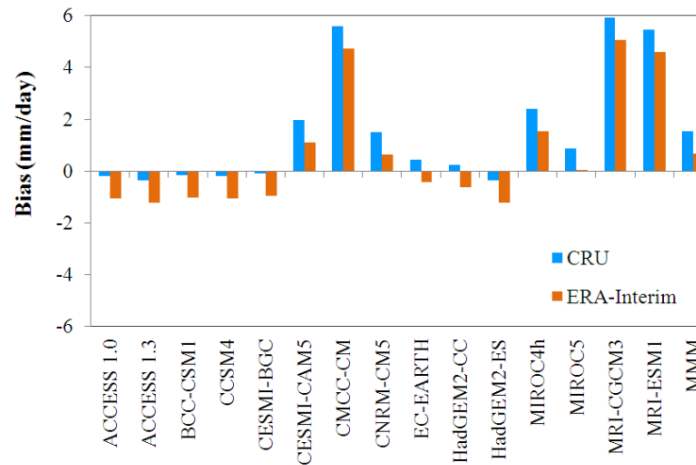
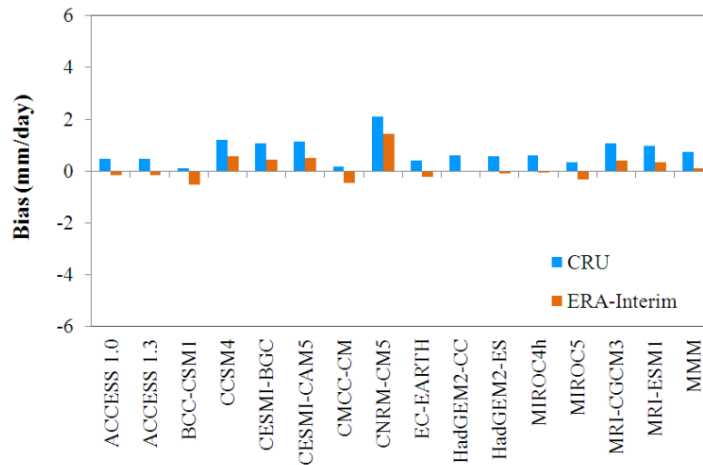
DJF

JJA

Temperature



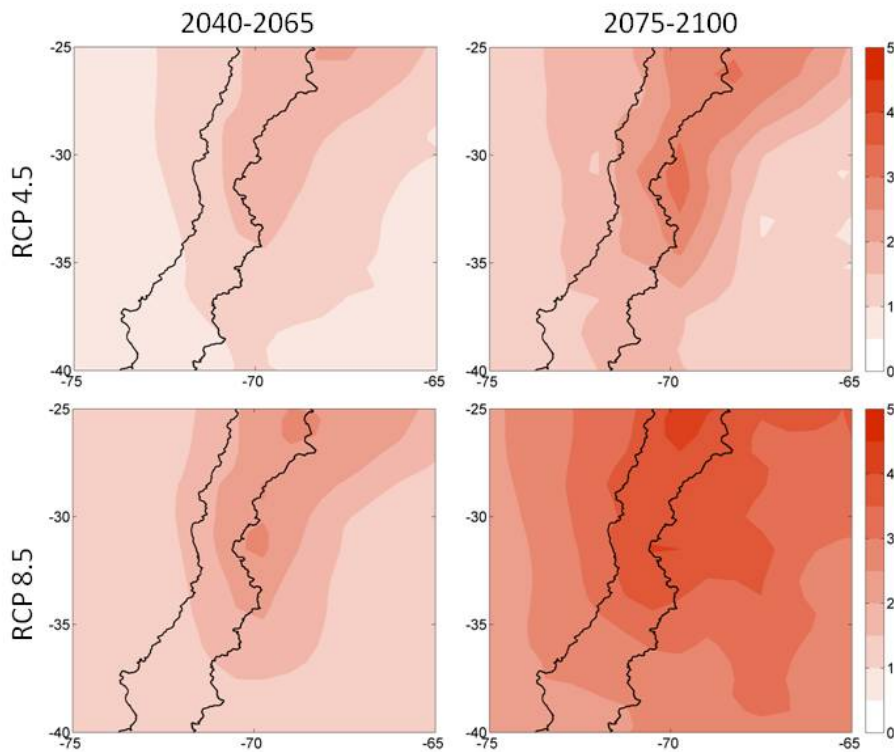
Precipitation



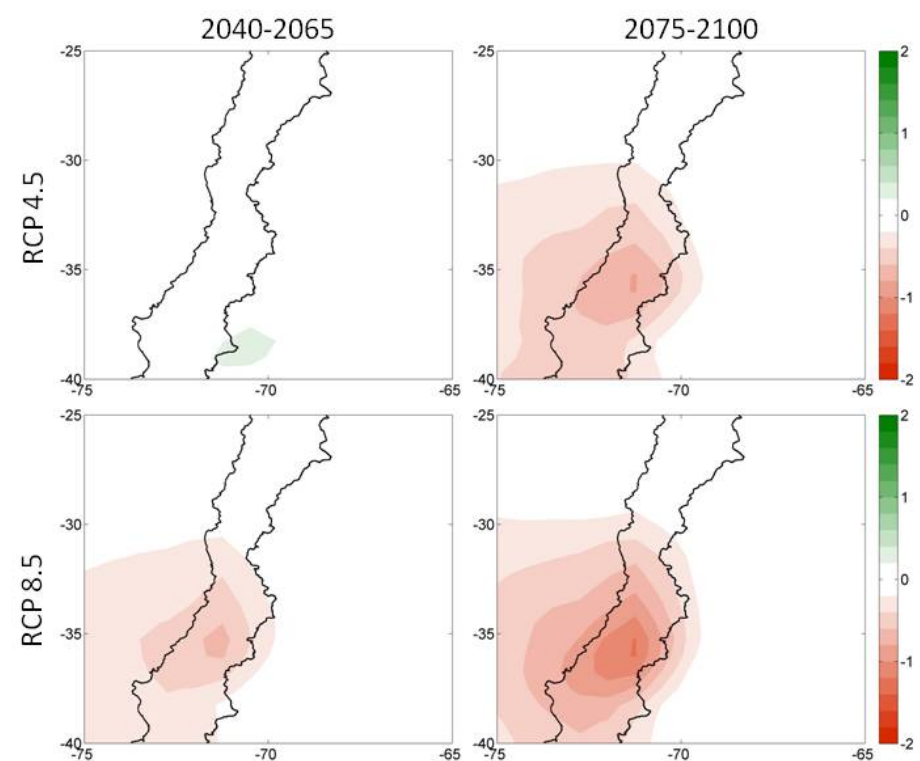
# FUTURE PROJECTIONS – RCP8.5

Differences with historical period (1980-2005)  
Subset of 6 GCMs with better performance  
(BCC-CSM1(m), CCSM4, CESM1-CAM5, CNRM-CM5, EC-EARTH)

## Temperature JJA



## Precipitation JJA





## FUTURE WORK

Can we get a better representation of the climate of this complex terrain region by means of high resolution models?  
Can we provide more reliable future projections?

**Thank you for your attention!**