

## WRF-Chem simulations and potential sources contribution on the Central Andes

Romina María Pascual Flores <sup>a,b</sup>, Tomás Rafael Bolaño-Ortiz <sup>a,b</sup>, Ana Isabel López Noreña <sup>a,b</sup>  
Salvador Enrique Puliafito <sup>a,b</sup>

<sup>a</sup> Grupo de Estudios de la Atmósfera y el Ambiente. Facultad Regional Mendoza. Universidad Tecnológica Nacional  
Rodríguez 273, Mendoza-Argentina (M5502AJE)

<sup>b</sup> Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET

e-mail: [rominapascual@gmail.com](mailto:rominapascual@gmail.com)

According to climate predictions, the Central Andes region would be greatly affected by climate change, which would cause an alteration in the relationships between liquid and solid precipitation, variations in albedo, changes in the seasonal distribution of Andean fluvial spills and overtaking in the runoff peaks. Due to the possible socioeconomic impacts in the region, it is necessary to design and implement adaptation strategies for these anticipated changes. An accurate prediction requires a correct representation of atmospheric conditions, their development and evolution. The Central Andes region is important because it contains the largest metropolitan area in Chile, Santiago and the fourth largest city in Argentina, Mendoza.

Atmospheric aerosols play a key role in the regional and global climate system. The particles of condensation nuclei of the cloud drop (CCN) and those of the ice nuclei (IN) determine the microstructure of the cloud and, consequently, the albedo of the cloud and the dynamic changes in precipitation induced by aerosols.

We present the first advances obtained about this problem on the Argentine territory, which until now has not been explored in detail. The work carried out by our research group focused on the province of Mendoza and demonstrated the sensitivity of the WRF-Chem model to the incorporation of aerosols in the simulation of precipitations over the region.

Two high resolution inventories were introduced: 1) a local national inventory GEAA (lat. 0.025° x long. 0.025°) prepared by our group which includes biomass burning, forest fires, energy production, residential consumption, transport, livestock and agricultural production; 2) a global inventory (lat. 0.1° x long. 0.1°) prepared by EDGAR (Emission Database for Atmospheric Research).

Simulation scenarios were examined in clean conditions (without aerosols) and in polluted conditions at different levels (including aerosols) for precipitation events recorded in the summer of 2013.