

## **Andean Uplift and Atacama Hyperaridity: A Climate Modeling Perspective**

RENÉ GARREAU, ALEJANDRA MOLINA AND MARCELO FARIAS  
Departamento de Geofísica, Universidad de Chile, rgarreau@dgf.uchile.cl

Atacama hyperidity has been attributed to its subtropical location, the cold waters over the adjacent southeast Pacific Ocean and the presence of the Andes cordillera. Although geological evidence reveals less dry conditions in the remote past, the timing of the arid-to-hyperarid transition is controversial. Several studies suggest that a transition between 19-13 Ma fostered by the concurrent uplift of the Andes. Other studies suggest a much earlier (~25 Ma) or latter (2-1 Ma) transition associated with ocean cooling.

Here we use PLASIM, a simple global climate model, to study the effect of the Andean uplift and sea surface temperature changes upon Atacama aridity. Decreasing the height of the Andes did not increase precipitation over the Atacama region, but rather decrease the precipitation over the Central Andes and the interior of the continent. These results suggest that the Andean uplift was not an important ingredient in the onset of Atacama hyperaridity, even if both events overlapped in time. In contrast, a regional warming over the southeast Pacific very effectively increase precipitation along the west coast of South America.