

Remote Observation of Environmental Parameters on the Surface of the Maricunga Salt Flat, Atacama Region, Chile

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Abstract : Today the estimation of effects produced by climate change in high Andean wetland environments is confronted by big challenges. This study provides a way to an analysis by remote sensing how some Ambient aspects have evolved on the Maricunga salt flat in the last 30 years, divided into the summer and winter seasons, and if global warming is conditioning these changes. The first step to achieve this goal was the recompilation of geological, hydrological, and morphometric antecedents to ensure an adequate contextualization of its environmental parameters. After this, software processing and analysis of Landsat 5,7 and 8 satellite imagery was required to get the vegetation, water, surface temperature, and soil moisture indexes (NDVI, NDWI, LST, and SMI) in order to see how their spatial-temporal conditions have evolved in the area of study during recent decades. Results show a tendency of regular increase in surface temperature and disponibility of water during both seasons but with slight drought periods during summer. Soil moisture factor behaves as a constant during the dry season and with a tendency to increase during wintertime. Vegetation analysis shows an areal and quality increase of its surface sustained through time that is consistent with the increase of water supply and temperature in the basin mentioned before. Roughly, the effects of climate change can be described as positive for the Maricunga salt flat; however, the lack of exact correlation in dates of the imagery available to remote sensing analysis could be a factor for misleading in the interpretation of results.

Keywords : global warming, geology, SIG, Atacama Desert, Salar de Maricunga, environmental geology, NDVI, SMI, LST, NDWI, Landsat

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