



Significant relationships between EN1+2 and EN3.4 SST with precipitation monthly anomalies in Northern Chile (1966-2015)

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Northern Chile is one of the most arid regions in the world, mainly represented by the Atacama Desert. Extremely arid conditions are found, but at the same time, in this area traditional conditions are developed such as agriculture or ranching. Nowadays, these activities coexist with industrial mining, which requires huge water amounts in a region with an evident water scarcity. Despite this, in the area occurs a rainy season in austral summer months (from December to March) derived from a concrete atmospheric circulation linked to the South American Monsoon and closely related with the ocean component of the climatic system. It is of high interest to determine the relationship between precipitations and the intertropical Pacific sea surface temperature. The monthly precipitations anomalies of the summer months for 161 meteorological stations located in Northern Chile were calculated for the period 1966-2015. The meteorological stations are homogeneously distributed across the study area, from the coast to the Andes, higher than 4,000 m a.s.l., and from the far north (18°S) to the southern extreme of the Atacama Region (29°S). The rainfall anomalies were correlated with the Pacific SST of the El Niño 1+2 and El Niño 3.4 regions, from zero up to 6 months gap, to evaluate the seasonal influence. Results show different relationships in the half north of the study area and southward the Capricorn Tropic, with differences also depending with the elevation/distance to the coast, as well as the El Niño region considered. The gap considered (from zero to 6 months) influence also the existing relationship, being negative when lower than 3 months, and positive when higher. According to this, it is possible to evaluate the contribution of the Pacific SST on the behaviour of precipitations, qualifying as wet or dry a season and providing an important background to water management in Northern Chile.