

Recent hydro-climatic trends in the arid northern-central Chile: assessing climate variability for policy makers

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Abstract Nival regimes, typical for arid mountainous areas, are highly dependent on precipitation and are strongly impacted by temperatures. Therefore, change detection in hydro-meteorological records is of considerable importance for water resources management and planning in these regions. This study focuses on the analysis of recent (1964–2006) non-parametric trends of seasonal precipitation, temperature and discharge records in “Norte Chico” (29°S to 32°S), Chile. A strong warming signal and an increase in precipitation associated with a shift of the rainy season have been observed over recent decades. However, precipitation trends over longer periods are not consistent with recent observations. Consequently, the regional discharge mainly dependent on snowmelt was found to be strongly impacted by changes in precipitation and temperature patterns. These changes underline the importance of flexible and adaptive measures. Hence, beyond offering one of the few contributions about climate trends with a focus on this part of the Andes, this work is also of practical use for local and national stakeholders.

Key words trend detection; precipitation; temperature; discharge; arid region; Chile