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Detection of trends and abrupt changes in the fluvial regime of argentine rivers with headwaters in the cordillera de Los Andes

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Hydrologic systems are potentially sensible to climatic change and in turn, this last one implies important modifications in the magnitude and temporality of the runoffs (floods and drought flows) produced by the interactions between precipitation and temperature fluctuations recorded in the basin. There are evidences of alteration in the water cycle in the Andean basins during the 20^{th} century, owing to the glacier retreat and mass loss during the last 100 years and particularly, during the last decades.

Based on daily hydrologic records of some basins, with headwaters in the cordillera de Los Andes and mountains of the Argentine west in a wide altitudinal gradient, we detected the possible changes in the runoff regime (long term trends and abrupt changes in the mean values) of the Bermejo, Las Cañas, San Juan, Mendoza, Tunuyán, Atuel and Chubut rivers.

The trend tests gave similar results for a 5% signification level. A positive trend was detected in the series of annual streamflow corresponding to the Las Cañas, San Juan and Mendoza rivers. In the Bermejo river all months had a trend, excepting February; the river Las Cañas had it at the beginning of summer (January), autumn (April to June) and winter (July and August); the San Juan river did not show a trend in those months with high water (November to March). All monthly streamflows show trends in the Mendoza River, the Tunuyán has them in the winter (July to September), while in the Atuel during the high waters period, from December to April there was no trend statistically significant. In all of the analyzed series, excepting the Chubut river, we identified years starting from where the mean values show a positive jump, statistically significant, corresponding to 1972, 1975 and 1971 of the series for Bermejo, Mendoza and the remainder respectively. Only in the San Juan and Atuel rivers, the oldest period until 1971, shows a significant trend.