

Development of hydrometeorological networks for early flood warning and drought monitoring.

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As it was stated by David Grimes in the 2015 World Meteorological Organization (WMO) report, it is indispensable to monitor extreme events at an adequate spatial and temporal scale that allows to evaluate the variability of a region's water resources. Monitoring networks for extreme events are developed as a result of a strategic partnership between a Research Institute, a water resources management Center, and a company that develops high precision sensors. The networks are mechanically and electronically robust to withstand extreme environmental conditions and the sensors in place at each station comply with the WMO requirements. A set of sub-networks within the main network will have a dual purpose: early flood warning to nearby settlements and monitoring of extreme events. The data transference can be done at real-time or near real-time depending on the type of event being observed. Each sub-network will be equipped with independent control centers that will facilitate flood alert releases. Satellite, radio telemetry, and GPRS will aid in data transfer between the network and the control centers where the information will be freely distributed. Each station in the network has multiple functions based on the selection of installed sensors (water levels, net radiation, soil moisture, and NDVI among others). The study area is the southern slope of the Salado River basin in Argentina which is frequently impacted by flooding and droughts. The basin's geology is characterized by Sierras in the headwater that transition into a hyper plain with slopes in the order of 0.001% which propitiates recurrent flooding of cities in the region. Higher than normal water table levels in the hyper plains generate waterlogging during prolonged periods of time. Conversely, prolonged drought has a negative impact on agriculture production which is the main economic driver in the region. Finally, the network is designed to evaluate the spatial variability of point measurements and to validate current and planned satellite missions.