Some new risks in operational water management associated with changing climate systems: reflections and case analysis

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Climate variability, climate change and hydrological variability are distinct phenomena whose effects on water resources can mean, among other consequences, changes in the conditions originally assumed in the design of hydraulic facilities. Hydrological variability takes place when there are changes on the main inputs and/or outputs of a hydrological system (precipitation, evapotranspiration, flows). This may lead to increased uncertainty associated with the normal functioning of the hydraulic facility and even the increased risk from potential damage and/or irreversible damage of the structure. This justifies the importance assigned by the specialized technical groups to the hydrologic variability. This paper presents some considerations concerning the hydrological behavior of river basins in situations associated with climate change, climate variability and hydrological variability. Some aspects of hydrologic design methodologies relating to scenarios characterized by hydrological variability are also included. Several case studies in the region of The Plata Basin, mainly in Argentina, illustrate the issues discussed. The considerations presented are intended to contribute to the awareness of new risks that arise in operational water management.