Climate Forecasts and its use for reservoir inflow forecasts in annual water allocation: Challenges & Opportunities

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The Northeast is the most vulnerable region in Brazil to climate variability and possibly to climate change. Historical records show a large number of severe drought events with considerable impacts to its population, although the vulnerability has been reduced due to investments in water infrastructure and management. Our case study, Ceará, is a semi-arid state whose development has been constrained by the limited availability of water and high variability of its supply. Ceará has a long history of government intervention to reduce the vulnerability of the rural subsistence farming population to climate variability through guidance for the selection of crops, agricultural practices, and land use. Also, the State of Ceará has invested heavily in the development of social programs for drought relief as well as water infrastructure and education resources.

Because of its sensitivity to climate, the region has invested in the development of meteorological forecast systems. Major efforts were made on both short-term weather and climate forecasts. The former focuses on the state of the atmosphere a few days in the future, while the latter provides an estimation of the amount of precipitation on monthly and seasonal time scales. Both forecast systems provide important information to decision makers in different sectors of society.

This presentation discusses the official climate forecast methodology currently adopted by Brazil performing an analysis of its performance over the 2002-2012 period and the limits of its use for applications. This presentation also introduces the alternative methodology, adopted by INMET-FUNCEME partnership, employed to generate climate forecasts for Brazil and, in particular, for the Northeast Region. Based on this approach, monthly and seasonal streamflow forecasts for the main reservoir of Ceará State, and soon, for the main reservoirs of the Northeast of Brazil.