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Manaus city Flow Warning system and extreme events monitoring in the Amazon Basin

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The Amazon basin is the biggest watershed in the world, in the center of this basin, there is a city called Manaus, with population next to 2 million habitants. Manaus city is bounded by Negro River; one of the main rivers in Amazon, this river has its level checked by Fluvial Station in the Manaus harbor, which has a range of 100 years of hydrological data records. The hydrological cycle in the region next to Manaus has certain regularity, its common variety is considered of 7 months of rising river, in other words, the fluvial quotes rising and 5 months of falling (ebb). Although, the water level variation in Manaus Harbor, from its draft to flow can achieve the variation up to 16 meters of water level height, this difference can affect all the Amazon region, happening impacts such as the interference of regional agriculture and fluvial transportation, besides the economic activities in the harbor and local population welfare, arising from extreme events. Considering the relevance of prediction and accompanying of flows and drafts, the Geologic Survey of Brazil implemented, since 1989, a warning system to these extreme events. This paper focused to demonstrate the a warning system implemented from equations based on the Manaus Harbor quotes, since Negro River has a regular hydrological cycle, thus, it is possible to predict the highest quotes in the hydrological year, in advance till 75 days with accurate prediction, in a gap of 45 to 15 days before the flow. This paper presents, also, the biggest events occurred in a hundred years of records collected by Manaus Harbor, as example, the draft happened in December 2010 and the flow in June 2009, as well demonstrating the values and impacts in the Amazon region.