

**Respective effects of climate change and anthropic action on the modification of the annual extension of flooded areas along Senegal river valley**

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The Senegal River Basin (300 000 km<sup>2</sup>) can be divided in an upper basin, which constitutes the main catchment area, and a low valley where flood propagation invades large areas. The hydrological monitoring of the Basin is almost complete from 1904 to 1998. A major change in climate has occurred at the beginning of the 70ies and is still over lasting with a persisting drought and a 50% reduction of the mean annual water volume. This has induced drastic reduction of flooded areas and consequent impacts on both human activities and ecosystem dynamics related to the flood regime. At the end of the 80ies a dam has been built on the upstream basin with the objective of regulating the river regime through artificial sustaining of low flows for hydropower, irrigation and navigation, while preserving a minimal flood for environmental purposes through artificial flood support.

The purpose of the present study was to develop a methodology to assess and quantify the respective effects of natural drought and anthropic action (river regulation) on the flooding regime of a given flood plain. The intention is to provide rational quantified elements to feed the debate on respective responsibility of climate change and human action, and help in defining an accurate management strategy for the reservoir.

Various flood plains have been monitored for two years through daily measurement of water levels both in the flood plain and in the river, regular measurements of flooded areas limits through GPS and analyse of remote sensing images. An hydrological modelling of the overall system has been elaborated, from the upstream basin to the flood plain : natural regime or reservoir management regime, flood propagation along the river, flood plain dynamics, ... This allows to compare the flooding of the plain for the 1904-1998 period, both under natural conditions (wet period 1904-1972 and dry period 1973-1998) and simulated reservoir management conditions. Methodological problems linked with the extrapolation of results to the overall flood valley are considered.

# MANAUS 99

## International Symposium Hydrological and Geochemical Processes in Large Scale River Basins

November 15-19, 1999, Manaus, Brazil

### PROGRAM and ABSTRACTS

Organized by **HiBAm**  
Hydrology and Geochemistry of the Amazon Basin



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