

## **Deriving short-term reservoir inflow forecasts for real-time optimization of reservoir operation to mitigate flood damage**

**GIOVANNI CARDOSO<sup>1</sup>, DAVID MONCUNIL<sup>2</sup>, DIRCEU S. REIS Jr<sup>1</sup>,  
EDUARDO MARTINS<sup>4</sup> & LUIZ NASCIMENTO<sup>1</sup>**

1 *Department of Water Resources, Research Institute for Meteorology and Water Resources – FUNCEME, Brazil*  
[giovannibrigido@gmail.com](mailto:giovannibrigido@gmail.com)

2 *Department of Meteorology, Research Institute for Meteorology and Water Resources – FUNCEME, Brazil*

3 *Research Institute for Meteorology and Water Resources – FUNCEME, Brazil*

**Abstract** This research was motivated by very damaging floods that occurred in the State of Ceara, Brazil, in the first weeks of 2004. The strategy adopted here is to use inflow forecasts, based on precipitation forecasts obtained by several atmospheric models and hydrological modelling to perform real-time optimization of reservoir operations. Results based on three years of forecast and observed data (2006–2008) show that the information contained in these precipitation forecasts can be of great value in the short-term reservoir inflow forecasts; comparisons show that the inflow forecast and the inflow estimated by COGERH are very similar, which is useful for the decision maker in a period of a flood event.

**Key words** forecast; flood; optimization; inflow forecast; damage curve; reservoir operation; Brazil