



Development of a Flood Forecasting System for the State of Rio Grande do Sul, Brazil

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While the development of flood warning systems on a national and continental scale are a reality in various places on the planet such as North America, Europe and Africa. In South America, most of the existing operational systems have as their application limits the watershed boundaries and the aim of supporting decision making for hydroelectric generation. At the same time, the agencies responsible for operating flood early warning systems and alerting about floods in countries such as Brazil are generally linked to national or regional government, with political boundaries differing from hydrographic boundaries. In this scenario, the present work presents the first development of a state-wide forecasting system in South America. The area covered by the system consists of the State of Rio Grande do Sul, located in the South of Brazil, bordering Uruguay and Argentina. In this way, the forecasts generated with the system are not only useful for the Brazilian side but are also useful for neighboring countries, helping on trans-boundary flood related issues. The system is operated in the Situation Room of the Department of Water Resources at the state level, generating one forecast per day, which is used to support the issuance of alert bulletins for the entire state. In addition, the results serve as a complement to existing local forecasts, focused on individual rivers. In the system, flood forecasts are obtained from the use of meteorological forecasts from a version of the WRF model that feeds the widely applied in South America hydrological model MGB (Modelo de Grandes Bacias) calibrated for the entire study region. The system has been in operation since September 2018, and the first results of its usage are shown in the present research, as well as the challenges of implementing, operating and disseminating the forecasts results. In a broader point of view, we expected that those experiences will help to improve the practices of a future South American Flood Awareness System, currently under development.