



Bayesian Networks for storm surge estimation in Mississippi (US)

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The unprecedented damage due to flood caused by hurricanes like Katrina (2005) has reinforced the interest of the hydraulic community to improve the storm surge estimation for the North Gulf of Mexico. Very high-resolution hydrodynamic models have been traditionally used for this end. However, these models are computationally very expensive. In this paper, a Bayesian Network (BN) is built to estimate storm surge at the coastal areas of Mississippi. A catalogue of HURDAT2 historical hurricanes is simulated in Delft3D FM to generate a surge data base that is used for the training of the Bayesian Network. The storm surge obtained from Delft3D FM is validated against observations recorded during a past historical event. The landfall location, the maximum wind speed, the forward speed and the forward direction of the hurricane at landfall are the other variables considered in the Bayesian Network. The Bayesian Network is validated by inferring values from past historical events in the model and comparing the modeled surge to observations.