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# CETEMPS

Telesensing of Environment and  
Model Prediction of Severe events

## I SEMINARI DEL GIOVEDÌ



A Flooding Early Warning System and Now Casting. Case study: St. Lucia (Caribbean)

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Giovedì 30 gennaio 2020, ore 11:30  
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### ABSTRACT

A model system is described aimed to forecast on the temporal scale from days to hours flooding events produced by large scale atmospheric circulation patterns. The early warning system integrates different models: 1) Rainfall tropical cyclone model that allows the calculation of hyetogram linked to few parameters of Tropical cyclone; b) Non-homogeneous hidden markov model and event synchronization model to link large scale atmospheric patterns to daily rainfall amount; c) shallow water hydrodynamic model that transforms rainfall in runoff in order to calculate water depth and velocity in inundated areas; d) multi-layer perceptron neural network (MLNN) that mimics the computationally expensive Shallow Water equations solver. Structure and validation of the model are presented for the case study of St. Lucia island (Caribbean)

### BIOGRAFIA

Francesco Cioffi is Associate professor in Hydraulics. His areas of expertise are experimental hydraulics (laboratory and field velocity and turbulence measurements), environmental hydraulics (hydraulic and water quality mathematical models, solid transport models) and, applied hydrology (floods/droughts vs. climate changes). At present he is working on rainfall pattern changes in the last Century, statistical downscaling methodologies for projections of rainfall, temperature and sea level in coastal areas under global warming scenarios, forecast models for Tropical Cyclone rainfall and flood events.

In the past, he has collaborated on over a dozen projects funded by Italian public institutions. These projects have concerned a number of research subjects including: control and management of erosion phenomena in coastal zones; inshore and off shore aquaculture plants; recovery and management of water quality of lagoons, rivers and lakes: control of tidal phenomena in the Venice lagoon; the management of solid transport in river and reservoirs.

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