



## **Storm surge forecasting for operating the Venice Flood Barrier with minimal impact on port activities**

Giovanni Cecconi

Consorzio Venezia Nuova, Venice, Italy (Giovanni.Cecconi@consorziovenezia.com)

The operation of the Venice storm barrier, due to enter into operation by the end of 2017, is particularly demanding in terms of the required accuracy of the forecast of the max water level for the time lead of 3-6 hours.

With present sea level and safeguard level established at 1.1 m a.s.l. of 1895 the barrier is expected to be operated 10 times a year to cope with an average of 5 storms with around 15 redirections of the navigation through the locks.

The 5 extra closures and the 10 extra interferences with navigation are needed for compensating the present forecast uncertainty of 10 cm in the maximum storm high for the required time lead of three hours, the time needed to stop navigation before the closures of the lagoon inlets.

A decision support system based on these rules have been tested along the last four year with satisfactory results in term of reliability easy of operations.

The forecast is presently based on a statistical model associated with a deterministic local model; the main source of uncertainty is related to the prediction of the local wind.

Due to delays in the completion of Venice local protection till 1.1 m it is expected that the population will urge a reduction of the safeguard level from 1.1m to 0.9m with an exponential increase in the number of closures with greater impact on navigation.

The present acceleration in sea level rise will also contribute to the increase in the number of closures.

To reduce the impact on port activity, better forecast accuracy is required together with experimenting new operational closures : e.g. activating only the northern barriers.

The paper evaluate the problem and the possible solutions in terms of improving storm surge forecast and developing new schemes for partial operation of the barriers for predicted limited floods not requiring complete closures.