

THE FLOOD PREDICTION IN VENICE

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The state of art in the Adriatic tidal studies, facing the problem of the Venice floods forecasting, can be summarized as follows.

There are "classical" achievements yielding the possibility of good predictions about six hours ahead. They are made possible by the good description of the ordinary tide, which is relevant (one of the most active spots in the Mediterranean) but favorably simple, free from overtides and similar disturbances. After it, the dynamics of seiches and surges was made clear. The knowledge of the current weather conditions over the Adriatic allows the kind of forecast summarized above, as it was shown in the Venice IBM Research Center¹, in the Weather Service of the Italian Air Force² and the Venice CNR Laboratory³.

Recent results concern the use of very simple numerical schemes for a quick forecasting. A linear predictive filter was implemented, acting only on the local observed sea level in Venice and the local atmospheric pressure. The results are surprisingly accurate (but in a different realm, with respect to the previous models): this can be seen as an inexpensive tool to decide for a warning. The method is still being improved⁴.

The new frontiers in this field are the 12 hours of good predictions. Meteorologists are doing their best for speci-

fic wind prediction models for the Adriatic⁵, and this (in connection with the existing schemes) is one of the solutions. Other approaches are tested, extending the "classical" point of view (which was successful in the Adriatic) to a wider area⁴ (the Central Mediterranean, say). The amount of knowledge about the relevant atmospheric phenomena is such (including the planned experiments within GARP, the well known international meteorological effort for the next years) that one can be confident in satisfactory improvements of the present status.

¹Sguazzero, P., Giommoni, A. and Goldman, A., 1972. "An empirical model for the prediction of the sea level in Venice". IBM Italia Tech. Rep. CSV006.

²Finizio, C., Palmieri, S. and Riccucci, A., 1970. "A numerical model of the Adriatic Sea for the study and prediction of sea tides at Venice". Ist. Fis. Atmosf., STR 12.

³Tomasin, A., 1973. "A computer simulation of the Adriatic Sea for the study of its dynamics and for the forecasting of floods in the town of Venice". Comp. Phys. Comm., 5:51-55.

⁴Tomasin, A. and Frassetto, R., 1978. "Cyclogenesis and forecast of dramatic water elevations in Venice", Tenth Internat. Liège colloquim on Ocean Hydrodynamics, May 8-12, 1978.

⁵Palmieri, S., Finizio, C. and Cozzi, R., 1976. "The contribution of meteorology to the study and prediction of high tides in the Adriatic". Boll. Geofis. Teor. Appl., 19:191-198.