

EFFECTS OF A “METEOROLOGICAL BOMB” INSIDE THE VENICE LAGOON

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I. INTRODUCTION

The phenomenon of local surges inside the Venice Lagoon was previously studied by various perspectives (Pirazzoli, 1981), (Ferla et al., 1994), (Melaku Canu, D. et al., 2002), (Berrelli et al., 2006). The aim of this paper is to illustrate a particularly strong Bora wind event, to be classified as a “meteorological bomb”. Although the event of the 24th September 2004 didn’t cause any flooding in Venice historical centre, it can be taken as an example of local surges within the Lagoon induced by local wind effects.

II. CONTEXT OF LOCAL SURGES

The phenomenon of high tides is typical of the Northern Adriatic sea, it is caused basically both by wind stress over the water surface and pressure variations. It has a scale of hundreds of kilometres. On the contrary the local surges have a scale of few kilometres within the Venice Lagoon and they are caused by wind stress on the lagoon water. Local surges can produce significant effects especially inside the lagoon borders. Bora wind (from NE sectors), has relevant effects in the southern Lagoon, nearby Chioggia island, the fishing areas and the bonification areas, situated below the mean sea level.

III. THE CASE STUDY

The pressure was falling down at Lido meteorological station from 1013 millibar since 1 am of the 23rd September 2004 to 1001 millibar at 04.00 am on the 24th September 2004. At 12.40 am the pressure raised from 1002 up to 1006 millibar; at the same time the wind had a rotation and remained on NE sectors from 12 am to 8 pm. The mean wind

speed raised from 2-3 up to 21 knots in 30 minutes’ time, lasting over 20 knots from 12.20 am to 7.10 pm and reaching a maximum mean wind speed of 31 knots at 4 pm.

These weather conditions are enough to recall the concept of “meteorological bomb”, with some fine distinction, defined elsewhere (Piervitali, 1997). The capabilities of this violent and sudden event are analysed, with emphasis on the remarkable effects of the wind over the local surges (maximum difference observed within the Venice Lagoon: 106 cm between different areas, fig.1).

IV. REFERENCES

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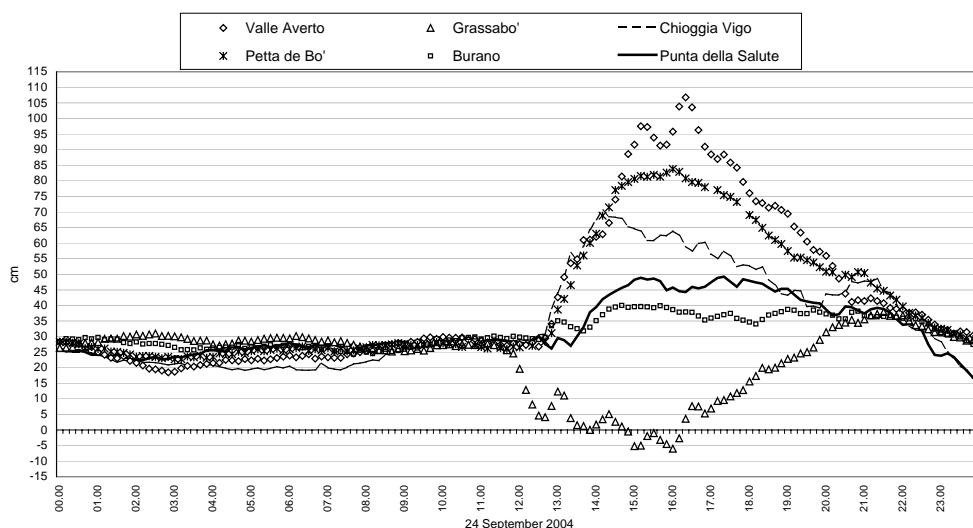


Fig.1 – Local surges induced by Bora wind during the 24th September 2004 event.