Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10168, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10168
EGU General Assembly 2008

Activity of the Gondola Fault Zone and potential earthquake sources offshore the Gargano Promontory (Adriatic Sea)

U. Fracassi (1), D. Di Bucci (2), D. Ridente (3), F. Trincardi (3) and G. Valensise (1)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, 00143 Roma, Italy

(2) Dipartimento della Protezione Civile, Via Vitorchiano 4, 00189 Roma, Italy

(3) Istituto di Scienze Marine (Geologia Marina), CNR, Via Gobetti 101, 40129 Bologna, Italy

(fracassi@ingv.it)

The Gondola Fault Zone is a 50 km long E-W striking poly-phased structure that dissects the southern Adriatic continental shelf and slope. Although its activity can be traced back to the Mesozoic, it has long been considered a tectonically inactive structure, also due to the mild and sparse seismicity on and surrounding the region.

In fact, recent studies have unveiled that the Gondola Fault Zone shows clear evidence of activity at least since the Middle Pleistocene and, locally, up to recent times, although with low slip rates (vertical slip rates up to 0.19 mm/a). Such evidence has been documented by means of very high resolution seismic lines (Chirp sonar) acquired in the last few years by CNR (Italy's National Research Council) on a very dense grid over the southern Adriatic Sea. In some cases, active fault segments, in the order of 10-20 km length, rupture up to the Holocene seabed.

The fault network we have recognized strongly suggests that it results from the right-lateral reactivation of the strike-slip fault system at the core of the Gondola Fault Zone. It has been suggested that the latter is part of a regional strike-slip system straddling a critical sector of the Adriatic foreland from east to west. Such system, named the Molise-Gondola shear zone, includes (from east to west) the Gondola Fault Zone (off-

shore the Gargano Promontory), the Mattinata Fault (i.e., the Gargano Promontory itself), the source area of the M 6.7 30-07-1627 earthquake, and the source area of the 31 Oct.-1 Nov. 2002 Molise earthquakes (M 5.8).

A number of moderate to intermediate earthquakes ($\sim 5 < \mathrm{M} < 6$) have occurred in the Gargano Promontory, as recorded by the historical and instrumental catalogs; some of these events have been associated with segments of the Mattinata Fault. However, for the M 5.4 10-08-1893 earthquake local tsunami features were documented (in the port of Mattinatella) by contemporary references, thus suggesting a seismogenic fault both (a) offshore and (b) capable of rupturing the Holocene seabed. Also, the sequence that in the same area has followed the latter earthquake in the following 8-10 years seems to have been caused by similar sources, given that the damage pattern of these latter events suggests that the epicentral areas lie in the nearby offshore. Last but not least, one should notice that, due to the very automatic methods used to treat intensity data in the historical catalogs, all historical earthquakes are located onshore despite their damage distribution.

In this work we test the hypothesis that these active fault segments that have ruptured the Holocene seabed (a) could be the ones responsible for these moderate magnitude earthquakes and (b) suggest that the Gondola Fault Zone behaves like a low-activity right-lateral strike-slip seismogenic system at the eastern termination of the Molise-Gondola shear zone.