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Evolution of the late Quaternary San Gregorio Magno tectono-karstic basin (southern Italy) inferred from geomorphological, tephrostratigraphical and paleoecological analyses: tectonic implications

Aiello G. (1), Ascione A.(1), Barra D.(1), Munno R. (1), **Petrosino P.** (1), Russo Ermolli E. (1), Villani F. (1)

(1) Dipartimento di Scienze della Terra University of Napoli Federico II L.go San Marcellino 10, 80138 Napoli (petrosin@unina.it)

The results of a geomorphological-stratigraphical study of the Pantano di San Gregorio Magno basin are presented.

The Pantano di San Gregorio Magno is a tectonic-karstic basin located in the axial belt of the Southern Apennines, an area affected by intense seismicity.

The basin was formed in the Middle Pleistocene and is presently undissected: it was reclaimed in the latest 19^{th} century. It is filled by lacustrine sediments (clays and pyroclastic sands) passing laterally into alluvial fan deposits.

Geomorphological investigations were integrated with tephrostratigraphical, palynological and paleoecological analyses of a 61m thick core (not reaching the bedrock).

The results of our study indicate that, during the last 200 ky, the basin hosted shallow freshwaters with an oscillating level. This condition was ensured by tectonic subsidence and comparable accumulation, the latter being enhanced by conspicuous pyroclastic inputs and, to a lesser extent, controlled by climate changes.

A subsidence rate of 0.3 mm/y averaged over the last 200 ky was estimated. Detailed estimates of subsidence rates at different time spans were also obtained. Values range from 0.02 to 0.97 mm/y over intervals of thousands of years. A 0.4 mm/y subsidence rate was obtained for the Holocene.