Geophysical Research Abstracts
Vol. 16, EGU2014-473-1, 2014
EGU General Assembly 2014

Evidence of human-induced morphodynamic changes along the Campania coastal areas (southern Italy) since the 3rd-4th cent. AD

Elda Russo Ermolli, Paola Romano, Viviana Liuzza, Vincenzo Amato, Maria Rosaria Ruello, and Valentino Di Donato

Department of Earth Sciences Environment and Resources, University of Naples Federico II -Naples, Italy

EVIDENCE OF HUMAN-INDUCED MORPHODYNAMIC CHANGES ALONG THE CAMPANIA COASTAL AREAS (SOUTHERN ITALY) SINCE THE 3RD-4TH CENT. AD

Elda RUSSO ERMOLLI,Paola ROMANO, Viviana LIUZZA, Vincenzo AMATO, Maria Rosaria RUELLO, Valentino DI DONATO

contact author: liuzzaviviana@libero.it
Dept. Earth Sciences, Environment and Resources, University of Naples Federico II - Italy

Campania has always offered suitable climatic and physiographic conditions for human settlements since prehistoric times. In particular, many Graeco-Roman towns developed along its coasts starting from the 7th-6th cent. BC. In the last decade, geoarchaelogical surveys have been carried out in the archaeological excavations of Neapolis, Paestum and Elea-Velia allowing the main steps of the landscape evolution around these towns to be defined in detail.
The greek town of Neapolis rose in the late 6th cent. BC [1] on a terrace overlooking a low-relief rocky coast surrounded by volcanic hills. Port activities developed in a protected bay facing the town from the 4th-2nd cent. BC up to the 4th cent. AD, as testified by the discovery of structures and shipwrecks [2, 3, 4]. Starting from the 3rd cent. AD a spit bar formed at the bay entrance causing the progressive establishment of a lagoon which was gradually filled up by alluvial inputs and completely closed in the 5th cent. AD. During the same period, episodes of increased alluvial inputs were also recorded further west along the coast, where a narrow sandy beach formed at the cliff toe.
The greek town of Poseidonia, renamed Paestum by the Romans, was founded in the 540 BC on a travertine terrace facing the sandy littoral of a prograding coastal plain [5]. In front of the main town door, a coastal lagoon developed thanks to the growth of a dune ridge and was probably used for harbor activities [5]. After this period the shoreline shifted seawards, another dune ridge formed and the back-ridge depression was filled with fluvial-marshy deposits, slowly drying up. Phases of travertine deposition, which characterized the SE sector of the plain all along the Holocene, were recorded in the northern and southern quarters of the town in historical times and were connected to the abandonment of the town in the early Medieval times.
The greek colony of Elea-Velia was located on top of a siliciclastic promontory where the ruins of the first archaic settlement (late 6th cent. BC) was unearthed. The Graeco-Roman town expanded downhill, exploiting the growth of a coastal plain, where occasional phases of flooding coexisted with the life of the citizens [6]. The onset of the 3rd cent. AD was characterized by phases of extreme floods which also occurred during the 4th and 5th cent. AD leading to several meters of ground-level aggradation and the burial of buildings [6, 7].
Although the three investigated sites are located in rather different morphological context, they show the evidence of a disequilibrium in the morphodynamics which started in the 3rd-4th cent. AD. The vast amount of collected data strongly suggest that this disequilibrium is a clear sign of a socio-economic decline which affected the Roman Empire during this period rather than the consequence of a climatic deterioration towards dryer conditions, for which no detailed data are available in the Mediterranean area [8]. The abandonment of the towns and their surroundings triggered increased soil erosion on the slopes suffering deforestation and in the farmlands for reduced maintenance, enhancing accumulation rates at the foothills and along coastal areas.

References
[1] D'Agostino, B., Giampaola, D., 2005. Osservazioni storiche e archeologiche sulla fondazione di Neapolis, in: Harris, W.V., Lo Cascio, E. (Eds.), Noctes Campanae, studi di storia antica e archeologia dell'Italia pre-romana e

romana in memoria di Martin W. Frederiksen, Napoli, 63-72.
[2] Giampaola, D., Carsana, V., Boetto, G., Bartolini, M., Capretti, C., Galotta, G., Giachi, G., Macchioni, N., Nugari, M. P., Pizzo, B., 2006. La scoperta del porto di Neapolis: dalla ricostruzione topografica allo scavo e al recupero dei relitti. Arch. Mar. Medit., Int. J. Underwat. Arch. 2, 47-91, Ist. Ed. Poligr.Int. MMVI, Pisa – Roma.
[3] Allevato, E., Russo Ermolli, E., Boetto, G., Di Pasquale, G., 2010. Pollen-wood analysis at the Neapolis harbour site (1st-3rd century AD, southern Italy) and its archaeobotanical implications. J. Archaeol. Sci. 37, 2365-2375.
[4] Russo Ermolli E., Romano P., Ruello M.R., Barone Lumaga M.R, in press. The natural and cultural landscape of Naples (southern Italy) during the Graeco-Roman and Late Antique periods. J. Archaeol. Sci.
[5] Amato, V., Aucelli, P.,D'Argenio, B., Da Prato, S., Ferraro, L., Pappone, G., Petrosino, P., Rosskopf, C.M., Russo Ermolli, E., 2012. Holocene environmental evolution of the coastal sector before the Poseidonia-Paestum archaeological area (Sele plain, southern Italy). Rend. Fis. Acc. Lincei. doi:10.1007/s12210-011-0161-1
[6] Amato V., Bisogno G., Cicala L., Cinque A., Romano P., Ruello MR., Russo Ermolli E., 2010. Palaeo-environmental changes in the archaeological settlement of Elea-Velia: climatic and/or human impact signatures? In Ciarallo A., Senatore M.R. (2010) Scienze naturali ed archeologia. Il paesaggio antico: interazione uomo/ambiente ed eventi catastrofici. Aracne Editrice, Roma, pag 13-16. ISBN 978-88-548-3525-2
[7] Russo Ermolli E., Romano P., Ruello M.R., 2013. Human-environment interactions in the southern Tyrrhenian coastal area: hypothesis from Neapolis and Elea-Velia. In: Harris W.V. (Ed.) The ancient Mediterranean environment between science and history Columbia Studies in the Classical Tradition 39, BRILL Leiden-Boston, ISBN 978-90-04-25343-8, pp. 213-232.
[8] Büntgen, U., Tegel, W., Nicolussi, K., McCormick, M., Frank, D., Trouet, V., Kaplan, J.O., Herzig, F., Heussner, K-U., Wanner, H., Luterbacher, J., Esper, J., 2011. 2500 Years of European Climate Variability and Human Susceptibility. Science 331, 578-582.