ISSN 1972-1552

Volume 2, 2007

Epitome

Geoitalia 2007

Sesto Forum Italiano di Scienze della Terra
Rimini, 12 - 14 settembre 2007

pianetaterra
Le Scienze della Terra per la Società
Commissione Italiana

FIST

Federazione Italiana di Scienze della Terra

available data series does not permit to exactly quantify such increase.
The observed temperature increase is supported by the presence in the Mar Piccolo of numerous warm-water non-indigenous species, many of which are lessepsian migrants, which are spreading throughout the basin. On the contrary, the cold-temperate water species, even though usually reported as invasive, are undergoing a regression.
In the light of these considerations, to know the temperature trend of a particular zone could permit to predict marine community changes and, in particular, the destiny of an introduced species on the basis of both its biogeographic element and affinity to temperature.

W10-88 Orale Antonioli, Fabrizio

10.1474/Epitome.02.0088.Geoitalia2007

RECORD OF COASTAL TECTONIC DEFORMATION FROM THE NORTHERN ADRIATIC COAST USING LAST 125 KA, LATE HOLOCENE AND INSTRUMENTAL DATA

ANTONIOLI Fabrizio[1], AMOROSI Alessandro[2], BONDESAN A.[3], BRAITENBERG G.[4], BUSETTI M.[5], FONTANA A.[3], FONTOLAN G.[4], FURLANI S.[4]
1 - ENEA, Casaccia, Rome Italy
2 - Dipartimento di Scienze della Terra e Geologico-Ambientali, Università di Bologna
3 - Dipartimento di Geografia, Università degli Studi di Padova
4 - DiSGAM, Dipartimento di Scienze Geologiche, Ambientali e Marine, Università degli Studi di Trieste
5 - OGS, Trieste

Presenter e-mail: fabrizio.antonioli@casaccia.enea.it

Key terms: North Adriatic; relative sea level rise; tectonic movements

Sea-level change along the Italian coast is the sum of eustatic, glacio-hydro-isostatic, and tectonic factors. The first is global and time-dependent, while the latter two are also affected by local variations. The glacio-hydro-isostatic part along the Italian coast has been recently predicted and compared with field data at sites not affected by significant tectonic processes. A compilation of published and new radiometric radiocarbon datings from materials and archaeological remains that are well connected to Holocene sea-level markers has been carried out in order to estimate short-term tectonic movements on the NE Adriatic coastline (Amorosi et al, 1999, Fontana et al., 2007, Massari et al., 2004, i., Mozzi et al., 2003). Rates of tectonic downlift were calculated comparing the observed data with the predicted local sea-level curves generated from the Lambeck et al. (2004) model. Results show that in North-eastern Italy, tectonic subsidence (corrected by the anthropogenic component) increases from east to west, with values between 0.3 and 1 mm/y, respectively. These data highlight a clear NE-SW tilting between Trieste and the Po Plain, where the highest subsidence values (around 1 mm/y) are attained and the base of MIS 5.5 deposits, lying at 120-130 m below sea level (Amorosi et al., 1999; 2004). New data from Roman age archaeological remains in Trieste gulf and Istria, lead to a tectonic downlift rate of ~0.7 mm/y, thus implying a possible increase of tectonic subsidence.
At the Gulf of Trieste (Italy), Benac et al., 2005, Antonioli et al., (2004, 2007) observed at Miramare a submerged tidal notch at an elevation of -0.6 to -0.8 m (tide corrected). Only ~6 km west, the elevation of the notch decreases to -0.9 m. In a north-west direction between Sistiana and Duino (Italy), the altitude of the notch continues to decrease from -1.3 m, to -2.5 m. In accordance with the local tide amplitudes (the highest in the whole Mediterranean sea) the width and amplitude of the notch are larger than 1 m. Our observations show that the present day notch is absent along the limestone coasts of the North-eastern Adriatic, between Duino (Italy) and Kotor (Montenegro), while a submerged notch occurs at about -0.6 m below the present day sea level. Several anomalies in the Gulf of Trieste are possible related to areas not affected by subsidence. New multichannel seismic profiles (Busetti et al., submitted) indicate the occurence of a compressional structure, crossing the Gulf of Trieste with NW-SE orientation from the Istria Peninsula to the Friuli Plain. Presence of this tectonic structure is confirmed by the compatration between the 14C analises of lagoonal fossils sampled by Ogrinc et al., 2005, with the Lambeck model. In order to have a control on our deduced vertical crustal movements, we compared some instrumental results (tide gauges, altimetric satellite Topex Poseidon) with the geologically determined values. Some of the instrumental dataset show agreement with long term data (Braitenberg et al., 2005).

W10-89 Orale Antonioli, Fabrizio

10.1474/Epitome.02.0089.Geoitalia2007

VECTOR PROJECT - LINE 3

ANTONIOLI Fabrizio[1]
1 - ENEA, Casaccia, Rome Italy

Presenter e-mail: fabrizio.antonioli@casaccia.enea.it

Key terms: Sea level rise; tectonic; isostasy

The level of the sea does not remain constant, it changes at varying rates, geographically and over time. Changes of sea level have affected human civilisations in the past (asm preserved in legends, such as that of Atlantis), and anticipated accelerated sea-level rise as a consequence of enhanced global warming seems certain to have serious ramifications in the future. It is imperative to identify and quantify the causes contributing to the present observed sea-level variability and change, in order that better predictive models can be developed. This will be especially important for planners and decision makers who will need not only forecasts of global sea-level rise, but also clearer ideas of how sea-level variability and change will be expressed at regional and local scales. For this pur pose The line3 of Vector project begun to study the regional relative sea level rise of the Italian seas. In order to understand present and future sea-level variability we must understand the past record, and it is instructive to review how our understanding of the processes involved has improved over the past two centuries. Ours aim is to summarise what is known about past sea-level changes, concentrating particularly on changes in ocean volume (or eustatic sea level) that have occurred over the past few thousand years since the termination of deglaciation of the major ice sheets. These changes are driven by global factors, including climate change and thermal expansion of the oceans, or regional responses, including glacio- and hydro-isostasy following deglaciation, or local responses to tectonic movements or deformations including volcanic and sediment loading . As regards the eustatic contribution of Italian seas, data are scarce, we were evaluating the tide gaudge data set and the Mediterranean river run-off and the Gibraltar flux.
What seem to be clear is that tectonic and isostatic coastal movements are well studied, less is known about eustatic component and the future increase due to the warming. Three coastal sites will be drilled in order to cross Holocene marine sediments and reach the Last Interglacial fossils deposits.

W10-90 Orale Aucelli, Pietro

10.1474/Epitome.02.0090.Geoitalia2007

GEOLOGICAL AND GEOMORPHOLOGICAL LATE QUATERNARY EVOLUTION OF THE SELE PLAIN (SOUTHERN ITALY): PRELIMINARY REPORTS FROM VECTOR PROJECT (VULCOST THEMATIC LINE)

AUCELLI Pietro[1], PAPPONE Gerardo[1], ALBERICO Ines[2], AMATO Vincenzo[1], CESARANO Massimo[1]
1 - Dipartimento STAT - Università degli Studi del Molise
2 - CIRAM

Presenter e-mail: aucelli@unimol.it

Key terms: coastal plain evolution; Sele plain; VECTOR; Campania; Italy

The Sele plain (Salerno, south Italy) is one of the areas selected for the study of the future impacts connected to the various effects of the climatic change along the Italian coasts. The Sele Plain orinates from the aggradation of a Plio-Quaternary depression located along the rifted inner margin of the souther Apennine Chain. It is about 400 kmq wide with a triangular plan outline, which is defined seawards by a straight sand coast, stretching between the towns of Salerno and Agropoli. The plain is closed landwards from Lattari and Picentini Mts. to the N and NW; and Alburni, Soprano-Sottano and Cilento Mts. to the SE. The boundaries of the plain are defined by NW-SE and NE-SW trending scarps, active during Early and Middle Pleistocene. The most internal portion of the orige marine embayment racked continental condition thanks to the huge phases of clastic sedimentary aggradation (up to 2000 metres of clastic deposits part of which are related to "Eboli Conglomerates"), during the Quaternary subsidence. Further seawards, there is the strip of plain that formed during the Last Interglacial (Tyrrhenian stage, OIS 5). It forms terraces between about 25 and 15 m a.s.l. and shows three orders of beach-dune ridges that interfinger at their back with lagoonal and fluvio-palustrine deposits. The present elevation of the Tyrrhenian complex proves that the plain has moderately been uplifted since the last interglacial. Only the youngest and most external of the Tyrrhenian coastal ridges still has a good morphological evidence (Gromola-Arenosola ridges). Between the Tyrrhenian ridge and the present shoreline, a last strip of plain occurs, which is not more than 5 m a.s.l. elevated. This strip was accreted during the Holocene. It includes a composite sandy ridges which is partly exposed along the present coast and disappears inland under a muddy, flat depression. Stratigraphic, paleoenvironmental and chronological known data allow to interpret the present setting of Sele plain's outer strip as the result of a barrier-lagoon system that migrated alternatively landward and seaward during the Holocene. After being exposed to subaerial condition during the last glacial regression, the study area gradually entered brackish water condition at the beginning of the Holocene. The inversion of tendency, from retrogradational to progradational, most probably can be ascribed to a decline of the rate of sea level rise below the threshold of balance with the progradation due to fluvial sedimentation. The progradation was interrupted by at least three minor trasgressive phases occurred between 8.4 e 2.0 ky BP, with formation of sandy coastal ridges, knows as Laura and Sterpina (I and II). In this time the lagoon was largely gained by palustrine condition which persisted partially until very recent times. The preliminary study of this last part of the plain have allowed to identify some areas mainly located in the back part of the most recent and external coastal ridges where the vulnerability seems to be important. Actually these areas are elevated only few metres a.s.l (from 0 to 4-5 m a.s.l.). Furthermore, this area has been interested by ponds and marshes until to the drainages operated in Borboun times and during the first half of the 1900. A dense series of drain-channels, connected through collectors to water scooping machine, allows the actual agrarian use of this depressed territory. The beach, that margins it seaward, stablised by a pinewood planted in the years 1930, is not wide and relatively steep, because of the withdrawal of the last decades, prevailing terms in attacking the coastal ridge deposits. This tendency of the present is more marked, due to the action along the principal rivers of the plain (Sele, Tusciano, Picentino) of anthropic riverside modifications and as well as by a river dam before the Sele river enters in its plain.

W10-91 Poster Basso, Daniela

10.1474/Epitome.02.0091.Geoitalia2007

INVESTIGATING THE GROWTH RATE OF MEDITERRANEAN RED CALCAREOUS ALGAE (NONGENICULATE CORALLINALES)

BASSO Daniela[1], CARAGNANO Annalisa[1]
1 - Univ. Milano-Bicocca, Dip.to Sc. Geologiche e Geotecnologie

Presenter e-mail: daniela.basso@unimib.it

Key terms: Corallinales; growth rate; coralligenous; Mediterranean

Calcareous red algae are widely distributed along the Mediterranean shelf. Literature data show that they are a major component of the coralligenous framework (=*Coralligène*; Peres, 1982) and other hard-substrate associations (review in Laborel, 1987; Bressan et al., 2001). As data on their abundance and distribution on soft substrates increase, their importance as common component of large areas of the Mediterranean shelf sediments becomes clear (Toscano et al. 2006; Canals & Ballesteros, 1997; Basso, 1998). At this stage of our knowledge, two issues require further investigation through a coordinated, multidisciplinary approach. The first involves the acquisition of data on the growth rate of the most common corallines. Growth rate data are the background information for subsequent studies of primary production, carbonate production and role of Corallinales in the present-day global carbon cycle, and for modelling a scenario of increased atmospheric CO_2 concentration. Presently, the few available data on coralline growth rate result from experiments at sea with a variety of techniques (capture-staining-recapture;