

INTERNATIONAL CONGRESS 2015

GeoSUB

UNDERWATER GEOLOGY

Organized by:

Associazione Italiana per lo Studio del Quaternario – AIQUA

Associazione Italiana Geografia Fisica e Geomorfologia - AIGEO

Dipartimento di Matematica e Geoscienze, Università di Trieste (Italy)

ENEA, Rome (Italy)

OGS, Trieste (Italy)

FIRST CIRCULAR

Organizing committee:

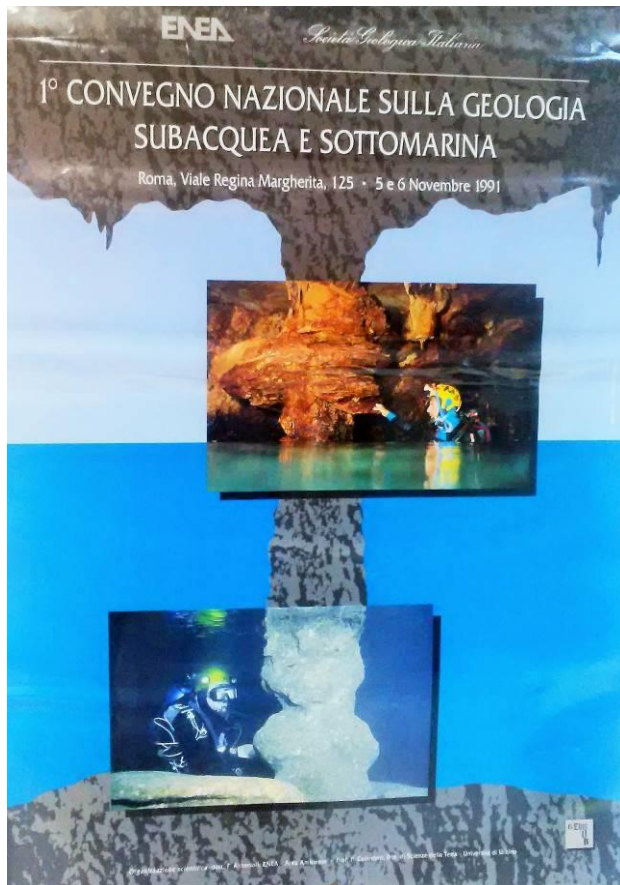
Fabrizio Antonioli, Marco Anzidei, Martina Buseti, Luigi Ferranti, Stefano Furlani, Giuseppe Mastronuzzi, Paolo Orrù

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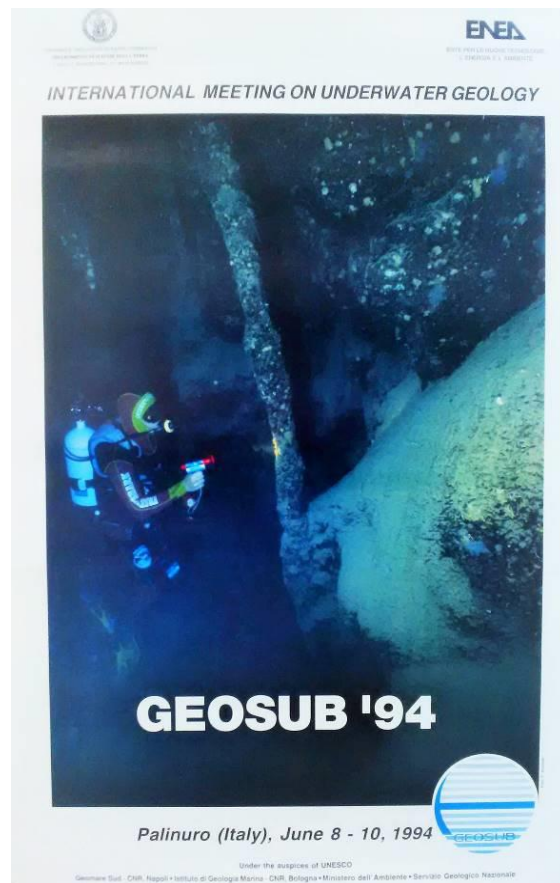
Trieste, 13-16 October 2015

Auditorium dell'Ex Pescheria, Salone degli Incanti

GEOSUB 1991



GEOSUB 1994

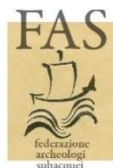


“GEOSUB 2015”: experiences in underwater environments

“GEOSUB- Underwater geology” is the third meeting about the most recent challenges in submarine and submerged geology. The meeting aims at bringing together all the experts involved in the underwater researches and explorations.

**AIQUA**

Associazione Italiana per lo Studio del Quaternario



SCIENTIFIC COMMITTEE

Fabrizio Antonioli (ENEA-UTMEA, Roma, Italy), Rita Auriemma (University of Salento, Italy), Marco Anzidei (INGV, Italy), Jonathan Benjamin (Flinders University, Australia), Martina Buseti (INOGS, Italy), Stefano Covelli (University of Trieste, Italy), Franco Cucchi (University of Trieste, Italy), Jadran Faganeli (Marine Biology Station Piran, Slovenia), Luigi Ferranti (University of Napoli, Italy), Alessandro Fontana (University of Padova, Italy), Giorgio Fontolan (University of Trieste, Italy), Stefano Furlani (University of Trieste, Italy), Ritienne Gauci (University of Malta), Mladen Juračić (University of Zagreb), Paolo Montagna (CNR-ISMAR, Bologna, Italy), Giuseppe Mastronuzzi (University of Bari, Italy), Paolo Orrù (University of Cagliari, Italy), Alessio Rovere (MARUM, Potsdam, Germany), Gianfranco Scicchitano (Department of Physics and Earth Science, University of Messina – Geologis srl Academic Spin-off University of Messina), Giovanni Zanchetta (University of Pisa, Italy)

DEADLINES

Registration: **30th May 2015** (name, surname, affiliation, title of the presentation)

Abstract submission: **5th July 2015**

Second circular: **1st July 2015**

COSTS (Euro)

	Students/Uncareers*	Others
Within 5 th June 2015:	/	20 €*
After 5 th June 2015:	20 €*	40 €

*Registration within 30th may 2015

Following the Congress, the 4th MEDFLOOD Meeting (MEDFLOOD group: Alessio Rovere, Stefano Furlani, Jonathan Benjamin, Alessandro Fontana) will be held in Trieste and surrounding areas.

LIST OF SESSIONS

Paleogeographic reconstructions and coastal monitoring using remote survey solutions (AUV/UAV)

Conveners G. Scicchitano (Department of Physics and Earth Science, University of Messina – Geologis srl Academic Spin-off University of Messina), E. Casella (Leibniz Center for Tropical Marine Ecology, Bremen, Germany - SEAMap srl, Environmental Consulting)

Remote survey solutions, both marine (Autonomous Underwater Vehicles) and terrestrial (Unmanned Aerial Vehicles), have been largely used in offshore and military industries. The technological development occurred in the last 5 years allowed these survey techniques to be used also for commercial and research purposes in offshore operations and in coastal and shallow water environments. Marine and aerial vehicles are able to cover autonomously wide areas, and can carry several geophysical instruments to perform accurate surveys. Their use is particularly indicated for paleogeographic reconstructions and coastal monitoring, since they are very competitive systems in local area applications and they are very efficient if repetitive data collection or when a rapid response is needed. They provide high spatial resolution morpho-bathymetric and morpho-topographic data at a customly-adjustable frequency and at an operational cost that is competitive in terms of costs and feasibility. AUVs and UAVs can provide new, multi-temporal insights in processes related to coastal changes with the potential of revolutionize our present knowledge. The precision of navigation systems allows them to fly very close to the ground or to the sea bed, surveying at an accuracy not available for classic systems. They can detect small changes in the morphology of the submerged and emerged surfaces. This accuracy results particularly important for the reconstruction of paleo geographic scenarios for the last millennia, together with the analysis of models that take into account other factors such as tectonics, glacio-hydro-isostasy and eustatic sea levels, and for coastal monitoring, trough the analysis of the morpho-topographic changes over time.

This session is open to all contributions providing insights on remote survey solutions, either marine or terrestrial, focusing especially on paleogeographic reconstructions and coastal monitoring applications.



Autonomous Underwater Vehicle and Unmanned Aerial Vehicle for coastal survey

Maritime archaeology and sea level changes

Conveners R. Auriemma (Università del Salento), M. Anzidei (INGV)

The coastline of the Mediterranean preserve a large number of archaeological remnants of human activity since the Last Glacial Maximum (18 ka BP) that can be used for geophysical and geological interpretations of sea-level change and humanistic studies. Maritime settlements, fish tanks, harbors and coastal quarries constructed in antiquity are among the best valuable sea level indicators for the past millennia.

In general, can be defined two main classes of coastal structures in relationship with past sea levels: i) those that were terrestrial but have now been flooded, and ii) those that were built with a precise relation to water level and which no longer function because of a change in sea level.

When a rigorous methodological approach of investigation is used, then can be reconstructed both the ancient coastlines and the patterns of the coastal settlements for “an integrated way of understanding humans in dynamic landscapes”.

In addition, this session will focus on the following critical points for underwater scientific research: i) familiarity with diving in shallow water, ii) the ability to perform good underwater video-photographic documentation, iii) the ability to collect geological, archaeological and topographic data to identify and describe the most significant architectural elements of the investigated coastal structures



Measurements at the Capo Malfatano breakwater

Relative sea-level changes in the coastal and underwater area based on geomorphological, sedimentological and biological markers

Conveners F. Antonioli (ENEA-UTMEA), L. Ferranti (University of Napoli), P. Montagna (CNR-ISMAR)

The level of the sea does not remain constant. It changes at varying rates, geographically and over time. Understanding past sea-level change plays an important role in determining the underlying causes, and also permits the extrapolation of past sea levels to locations and epochs for which there are no instrumental data. In this session we aim to bring together direct observations made under the sea and in the coastal zone of ancient sea-level markers, finalized to assessment of past sea-levels and to unravelling the relative contribution of different processes (e. g. eustatic, tectonic and isostatic) involved in relative sea-level changes.

Paleo-sea-level indicators consist of various types, including sedimentary (such as beachrock), erosional (such as notches), ecological (such as accretionary bioherms constructed by coralline algae), and archaeological (such as fish tanks). Beside these conventional markers, we also encourage contributions from studies of flooded caves speleothems, which can only have grown when sea level was below the depth at which they are found. Some submerged stalagmites may result of particular interest when they exhibit one of more contiguous and paired layers of continental concretion and marine overgrowths. Stable areas, like Sardinia, Tuscany and S. Latium are key sites for test regional geophysical models of sea-level change, while subsiding and uplifting coasts provide means to investigate the post-LGM transgression in different tectonic contexts, and their possible sources.

We also seek contributions coming from direct observations and finalized to construction of future sea-level flooding scenario, a presently important geo-hazard issue because of the anthropic pressure along the Mediterranean coast.



Argentarola cave submerged speleothems with serpulids overgrowth

Submarine and coastal morphodynamics: new legends and thematic mapping

Conveners G. Mastronuzzi (Università di Bari), S. Furlani (Università di Trieste), P. Orrù (Università di Cagliari), G. Fontolan (Università di Trieste), R. Gauci (University of Malta)

The classic dichotomy forms-processes used in the geomorphological mapping is too often based to static concepts, especially when applied to marine and coastal areas, affected by fast dynamic events, sometimes paroxysmal.

In this session we would stimulate the debate on representation of active processes applied to coastal and underwater contexts, aimed to the implementation of classic geomorphological legends. We encourage contributions that tend to clarify the importance and the need of representing processes in the context of the Quaternary evolution, as well as examples from more recent or modern processes. We expect also contributions aimed to develop cartographic synthesis that - starting from the Pleistocene and Holocene evolutionary context - highlights both the dynamic trends and the distribution, magnitude and hazard of active processes, with particular reference to extreme meteomarine episodes.

As an example, spatial investigation and thematic mapping will be appreciated, on environments and themes, as follow: (i) landforms in rapid change in rocky coast environment (cliffs, caves and other), (ii) forms in rapid migration in mobile wave- and tide-dominated environments (beaches, spits, tidal flats, salt marshes, etc.), (iii) depositional and erosional processes in beach-dune system, and (iv) forms and dynamics related to episodic events affecting the coastal area.



Storm waves along the Ionian coast of Apulia

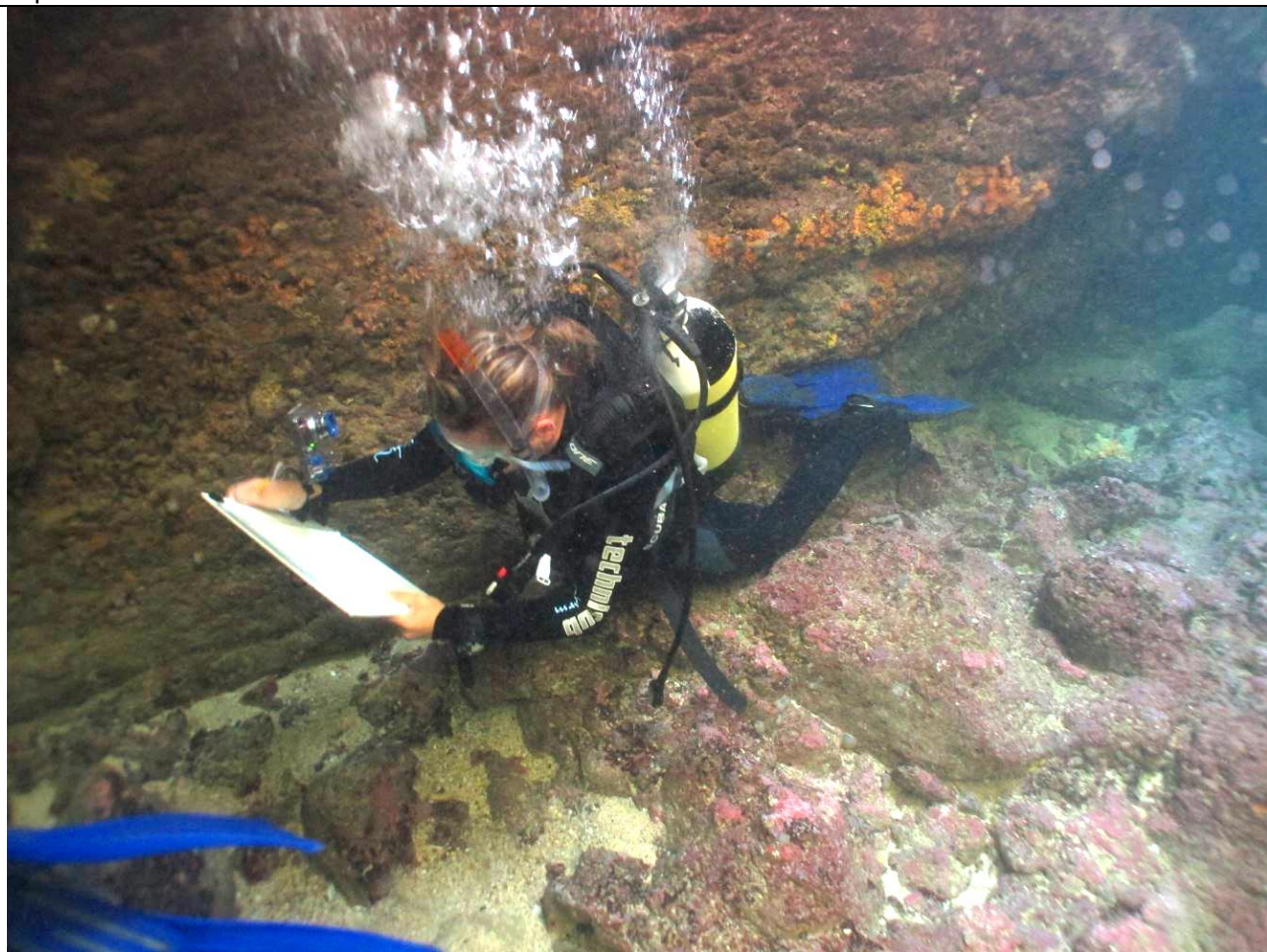
Challenges in diving and cave diving: exploration and research

Conveners L. Casati (Speleosub), A. Fabbricatore (CAI, Commissione Grotte E. Boegan”), S. Furlani (Dipartimento di Matematica e Geoscienze (Università di Trieste))

People have had a consuming interest in going beneath the sea. But until a century ago, humans investigated the submerged environments from boats on its surface. In the last years, different disciplines devoted to the exploration of underwater environments, such as cave diving, wreck diving, ice diving and deep diving increased, thanks also to the improvement of technological aspects.

Nowaday, ROVs and AUVs provide very interesting possibilities in underwater researches, but to really see and explore what underwater environment is like inside, scuba diving is sometimes still the only way to explore the innermost and unaccessible sites, such as the submerged caves.

In this session, all contributions providing insights and news on diving and cave diving, deep diving and ice diving explorations and the related researches are welcomed, in particular regarding karst and coastal explorations.



Underwater surveying of a submerged cave along the Eastern Adriatic

Underwater habitat mapping

Conveners C.N. Bianchi (University of Genoa, IT), P.E. Orrú (University of Cagliari), A. Rovere (MARUM, University of Bremen & ZMT, Leibniz Center for Tropical Marine Ecology, Bremen) & LDEO, Columbia University, NY

Cartography is an essential tool to analyze the spatial aspects of natural environments. Maps in marine environments have in general the aim to assess geological or ecological features and locate vulnerable areas in need of conservation. With respect to environmental cartography on land, underwater habitat mapping proposes to cartographers evident operational difficulties, which are often solved integrating SCUBA scientific diving techniques, ROV inspections and geophysical surveys.

In this session, we welcome contributions that i) present synthesis charts highlighting the interaction between geomorphological and sedimentological characters of the seabed and the dynamics of biocoenosis; ii) describe approaches and results related to underwater habitat mapping, especially those focusing on the cartography of continental shelves. Embracing a large definition of 'habitat', we welcome contributions that focus on geological or ecological mapping, or both.



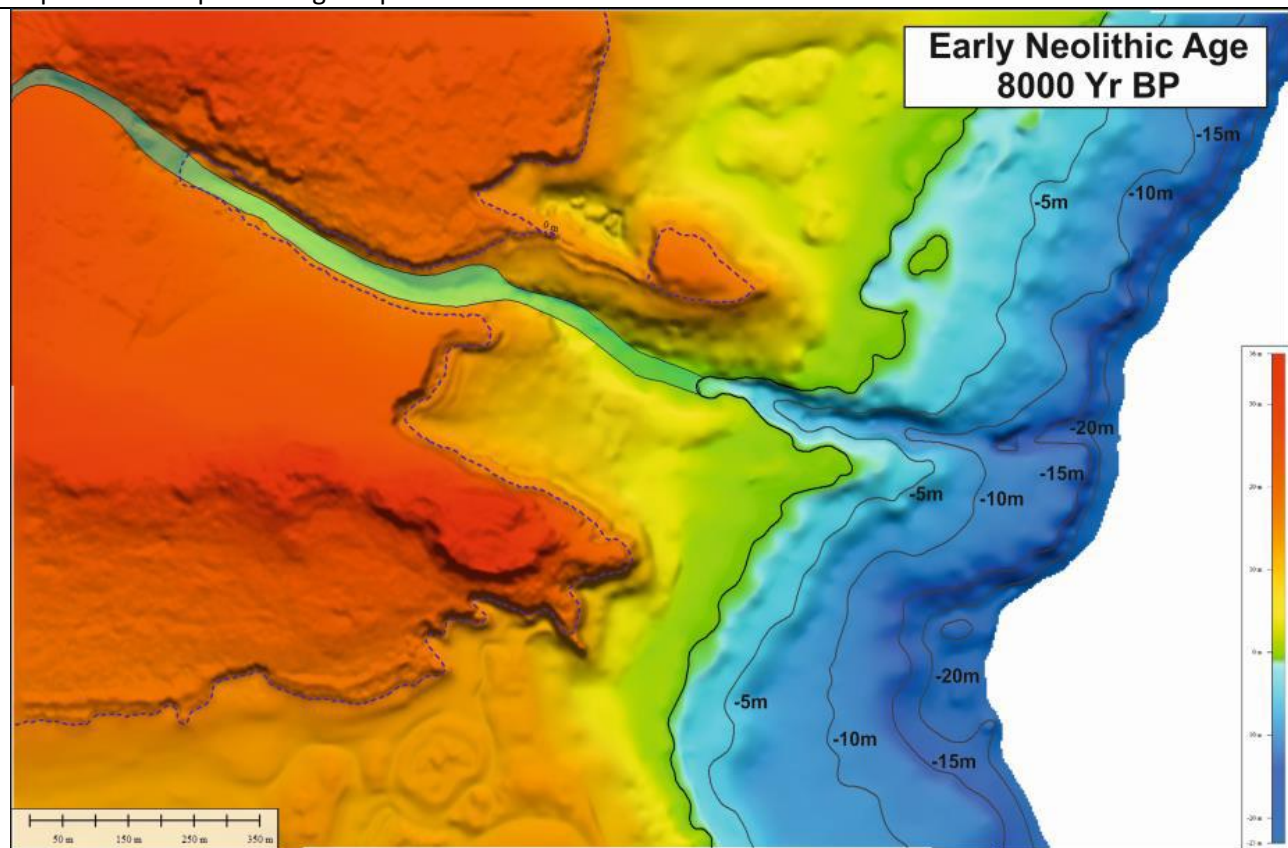
Direct survey of geomorphological and ecological features of a fault scarp in the ignimbritic lavas of Cala Fico, Island of San Pietro.

Palaeo-sea-level markers since the Last Glacial Maximum on the Mediterranean shelves: geomorphic, sedimentologic and stratigraphic evidence

Conveners M. Zecchin (INOGS), D. Casalbore (La Sapienza University), S. Ceramicola (INOGS), F.L. Chiocci (La Sapienza University), V. Lo Presti (La Sapienza University), E. Lodolo (INOGS), P.E. Orrù (UniCA), F. Antonioli (ENEA-UTMEA)

After the Last Glacial Maximum (LGM, ca. 21 cal ka B.P.) the sea level rose of 120-130 m in 20 ka, leading to the inundation of continental shelves. This process was characterized, from place to place, by highly variable patterns because of the morphology and of the contribution of local tectonics and glacio-hydro-isostatic effects, combined with the eustatic sea-level rise. Drowned barrier-lagoon systems, palaeo-coastal cliffs, and depositional terraces in shelf and shelf-margin settings represent key geomorphological markers for the identification of ancient shorelines and deposits that accumulated in shallow water during the post-LGM marine transgression. The recognition of these markers and the determination of their age, therefore, have fundamental implications for precisely reconstructing the post-LGM relative sea-level rise.

We welcome in this session contributions that use multi-disciplinary approaches, such as underwater imaging (i.e., multibeam swath bathymetry, sub-bottom profiling, high-resolution seismics, ROV, AUV) and geological methods (i.e., seafloor samples, cores, wells, etc.) to document palaeo-shorelines and coastal deposits developed during the post-LGM sea-level rise in the Mediterranean basins.



Paleogeographic reconstruction of the Ognina island using subbottom methodology

Ancient and modern tidal channels: morphology and evolution

Conveners Federica Rizzetto (Istituto di Scienze Marine, Consiglio Nazionale delle Ricerche)

Tidal flats are dynamic systems generally located in sheltered or low-energy coastal areas, between low- and high-tide levels. They are dissected by meandering channels, which play an essential role in the morphodynamic evolution of wetlands and in the development of their ecosystems, as they allow the distribution of water, sediments, nutrients, and pollutants.

The aim of this session is to discuss origin, geomorphological characteristics (i.e. shape, extension, morphometry, channel bedforms) and long- and short-term evolution of tidal channels and the control exerted by their geometric features in influencing hydrodynamic and transport processes. Contributions describing different methodological approaches of investigation and analysis of both modern and ancient channel networks are also welcome.



Tidal channels in the Venice Lagoon (Consorzio Venezia Nuova, 2010).

To apply to the Conference:

- Email your abstract to sfurlani@units.it by 5 July 2015
- Please use the subject heading “**Geosub2015**” where you select oral or poster as your preference

Abstract Formatting:

Please follow the following guidelines and use Times new roman 12pt font throughout.

Margins all set to 1”.

Please submit as a Word document (not pdf).

TITLE (all caps, centered) [skip one line]

Authors: (centered: Last name, Initials with no periods or spaces) [skip one line]

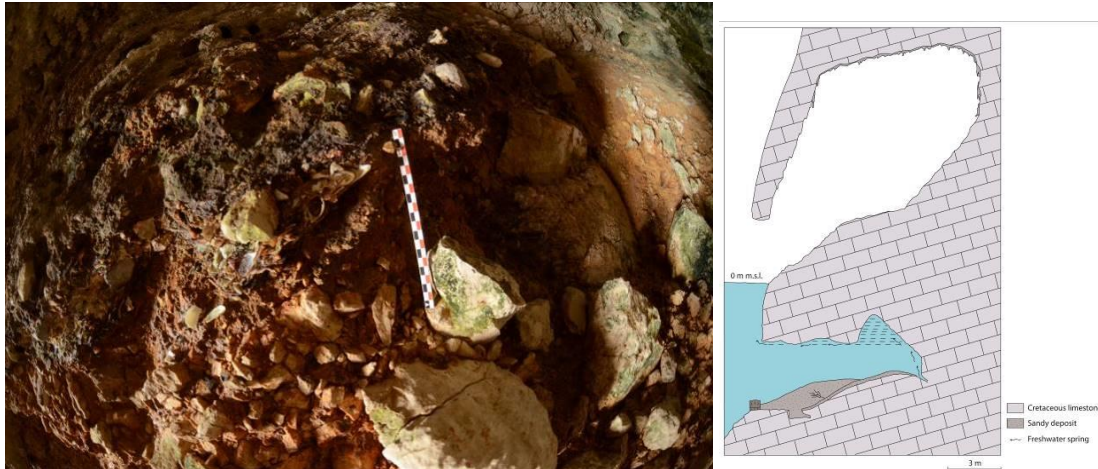
Institutions: (centered, Italics) [skip one line]

Abstract text: left justified, no indent for first line of each paragraph, skip one line between paragraphs, not to exceed one page in length.

Please contact Stefano Furlani for further information (sfurlani@units.it).

FIELD TRIP 1

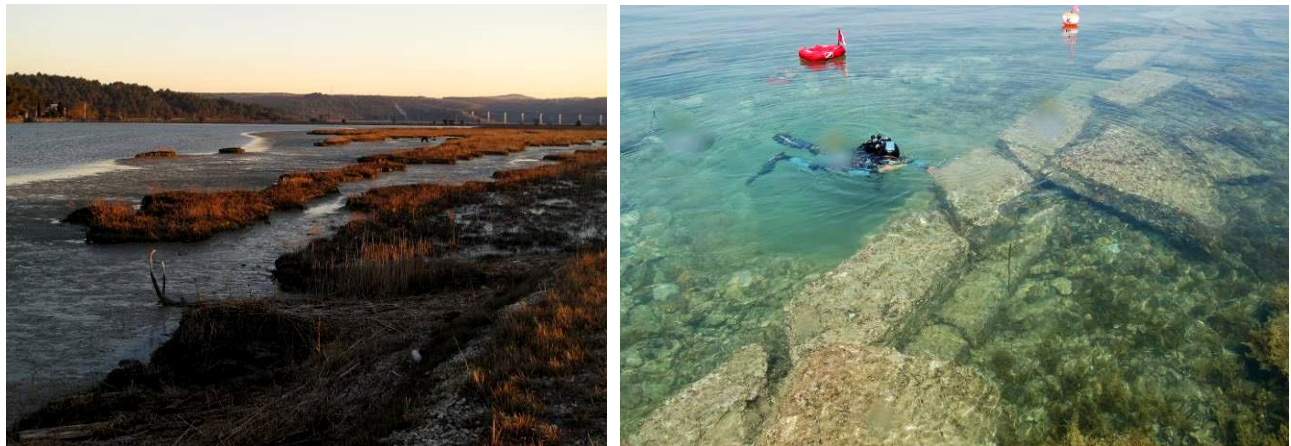
15 October 2015: Golubere cave and plunging cliffs along the eastern Istrian coast (S. Furlani, DMG, University of Trieste; F. Antonioli, ENEA-UTMEA, M. Juračić, University of Zagreb) – 50 Euro/100 Euro (with dive), max 18 persons – prices could slightly change following the number of participants



The boat trip aims at visiting and discussing the late Holocene evolution of the limestone plunging cliffs along the eastern Istrian coast. During the excursion, there will be the possibility to dive in a small submerged cave and the surrounding area and to visit an emerged cave with Quaternary deposits.

FIELD TRIP 2

16th October 2015: Western Istrian peninsula from mid-Holocene transgression to Roman Age, in collaboration with MEDFLOOD project (R. Auriemma, University of Salento – IPAC FVG; A. Fontana, University of Padova; I. Koncani, Archaeological Museum of Pula; S. Furlani, University of Trieste) – 50 Euro/max 25 persons - prices could slightly change following the number of participants



The fieldtrip will provide an overview of the Holocene evolution of the NW Istrian coast, with stops at the Mirna River deposits and the submerged remains of Savudrija Roman harbor. The excursion is organized in collaboration with the MEDFLOOD project (INQUA) and the Project *Storie dal mare* (AMI - Archaeological Museum of Pula and Department of Cultural Heritage - University of Salento, in collaboration with University of Trieste and Museum of Umag).