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heavy snow loads cause sea water flooding at the ice-snow interface, and the superimposed ice formation when melted snow re-freezes at the snow-ice interface under positive temperature gradient within snow and ice. Following Semtner 0-layer model, the sea ice system consists of one layer of ice and one layer of snow on top. If the ice draft exceeds the ice thickness, snow ice formation is initiated. Snow density and compaction are changed accordingly and a new isostatic equilibrium is formulated. No seawater mass is added and snow is compressed to an amount of new snow ice equal to the initial depression below the water line. If melted snow re-freezes under freezing conditions, superimposed ice formation is also initiated by transforming a fraction of snow, depending on snow properties, in superimposed ice. Snow ice and superimposed ice play important roles, not only because they change the snow properties and the consequent rate of the ice growth, but also because they create suitable habitats for sea ice algae, bringing nutrients where the light is a minor limiting factor. Micro algae find a larger access to nutrients and more stable environmental conditions in the last centimeters of the ice sheet, but are often limited by thick snow covers that prevent sufficient light to penetrate. As a first testbed application in data-rich areas, the model has been implemented in the Baltic Sea and validated in four different stations (Ajos, Kummelgrund, Jussaro, Kotka) against observations provided by the Ice Service at the Finnish Institute of Marine Research. Atmospheric forcing data are from the ECMWF-ERA 40 Reanalysis. Other geophysical properties, such as salinity, density and brines characteristics have been recently included, since they are closely related to the physiological and ecological response of sea ice algae. A coupled version with BFM (Biogeochemical Flux Model) is currently under development. The BFM represents the biogeochemical processes of pelagic ecosystem emphasizing the flows of the major biogeochemical elements from the (in)organic pelagic pools through the food web as a function of organisms' demand and trophic relationships. Sea ice ecosystem is still poorly understood, due to sparse observations and complexity of the interactions between environmental factors and ice biota. Ecosystem models can be thus a valuable tool to better understand the processes that control the dynamics of the sea ice algal community, its contribution to the total primary production in relation to its phytoplankton counterpart, its fate after being released in the water column, and its contribution to the global carbon cycle. The coupled model can be further coupled with a 1-dimensional turbulence model to better resolve the oceanic fluxes and mixing/stratification processes. In the future it will further be extended with a dynamic model of ice growth for 3-dimensional simulations.

W10-153 Orale Tessarolo, Chiara

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A CASE STUDY OF THE CORRELATION BETWEEN STEEP AND NARROW MARGIN WITH THE DEVELOPMENT OF FLUVIAL STRUCTURES: THE IONIAN CALABRIAN AREA

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Key terms: Ionian Calabrian Margin; basins and shelf morphology; seafloor topography

The Calabrian Ionian margin represents a particular geo-structural setting for the development of an original fluvial system, peculiar for this own area. Structural movements, correlated to the opening of the Tirrenian sea, have encuraged a rapid and important uplift of the area localized in the frontal part of the arc in translation, determinating quite high relief inland, and a narrow and less well developed shelf offshore.
In association to this structural setting, the particular climate regime of this area, characterized by seasonal, very intense an sporadic meteorological events, point up to the development of short but steep rivers, with a medium extension in basins area and responsible for an intense and active mass transport to the shelf and the upper slope: the called Fiumara.
This kind of rivers have also been responsible for the development of erosional structure, even wide and deep, localized offshore.
On the base of this assumption, in the framework of Vector Project (line Vulcost), five (four in the original project) rivers (Fiumara Torbido, Allaro, Amusa, Precariti, Novito) have been selected to point out the correlation between these peculiar fluvial frameworks and the interrelate generation of two very wide systems of canyon, on the shelf and beyond it: the Caulonia and the Marina di Gioiosa Canyons.
A Multibeam (Seabat 8160) and Sub-bottom Profiler (GeoChirp II) survey collected in 2006, and a subsequent study of the Morphological and stratigraphic characteristics of the area, in association to an elaboration and evaluation of data of the basins onshore, have enabled to point out a preliminary characterization of the geo-morphological peculiarities of the selected area.
This study has been developed considering in that way the relation between the typology of margin, the kind of hydrographic basins developed, the sedimentary and erosive processes in act, and the correlated progress of marine structures offshore, in the aim of an evaluation of the coastal zone modification and evolution.

W10-154 Poster Tosi, Luigi

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COULD SALT WATER INTRUSION AND LAND SUBSIDENCE TRIGGER SOIL DESERTIFICATION IN THE CATCHMENT SOUTH OF THE VENICE LAGOON (ITALY)-

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Key terms: saltwater intrusion; land subsidence; soil desertification; Venice Lagoon; Bacchiglione-Brenta river mouth

The catchment south of the Venice Lagoon is threatened by shallow aquifer salinization and land subsidence. Although the area is not experiencing everywhere saline contamination and high sinking rates, a very serious situation has been brought to light in a large portion of the coastal farmland. The salt water contamination, recently investigated within a series of research projects, i.e. ISES, BRENTA, Co.Ri.La. 3.10-3.16, extends up to 20 km inland from the coast (Carbognin and Tosi, 2003; Rizzetto et al., 2003; Carbognin et al., 2005, 2005b). The depth of the fresh/salt-water interface varies from 1 to 30 m below the ground level and exhibits a significant, mainly seasonal, time variation. The dynamics of the soil salinization process is especially sensitive to changes in river (Brenta, Bacchiglione, Adige, Gorzone) discharges, in groundwater and channel levels regulated by a number of pumping stations of the reclamation network, and in weather conditions.
At the same time an ongoing land subsidence with rates varying from few mm/yr to cm/yr affects the southern lagoon margin and the nearby watershed (Tosi et al., 2000; Teatini et al., 2007). The settlement of these territories is mainly due to natural consolidation (Teatini et al., 2005) and geochemical subsidence, i.e. peat oxidation promoted by farming activities (Gambolati et al., 2005).
Salt water intrusion and land subsidence combined with significant dry seasons expose this area to the potential soil desertification. The combined effect of both processes is producing an alarming social and environmental impact on the south Venice coastland, also in relation to the expected global climate change.
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W10-155 Poster Tramontana, Mario

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GEOMORPHIC EVOLUTION OF WAVE-CUT CLIFFS AT THE NORTHERN MARCHE RIVER MOUTHS

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Key terms: Wave-cut cliffs; Coastal evolution; River mouth; Northern Marche

The north Marche coast reach between Gabicce and Senigallia is characterised by a relatively continuous coastal plain at places narrowed or interrupted by rocky cliffs (i.e. San Bartolo and Ardizio, north and south of Pesaro respectively). The seafloor is constituted by soft sediment of various grain size (from sand to mud) except for the seafloor off San Bartolo cliff, where a wide, still active rocky wave-cut bench occurs. The coastal plain merges into the terminal sectors of the major fluvial plains and also encloses the downstream reaches of minor streams debouching directly into the sea. Two important morphologic features characterise the coastal plain: (i) the coastal plain ends landwards against either the base of hill-slopes straightened by marine erosion or rocky paleo-cliffs; (ii) the coastal plain is locally stepped by a minor discontinuous wave-cut cliff cutting late Quaternary gravels and sands. Such wave-cut cliff is a distinctive landform occurring close to the major river mouths; elsewhere, this landform appears only in some areas, in particular at the mouth of minor streams draining directly into the sea (e.g. Ponte Sasso, Fosso Sejore). Indeed, the wave-cut cliff is clearly connected with river mouths. It is well-formed, with sharp profiles and heights reaching 5-8 m at the Metauro and Cesano river mouths; it is recognisable at the Foglia and Misa river mouths as well, nonetheless here it is less defined displaying smoothed profiles and heights not exceeding 2-3 m. This landform is associated with late Pleistocene-early Holocene coastal fans, built up in conditions of relatively low sea-level and likely related with cold climate stages (Dryas). Such chronological attribution is supported by some radiocarbon datings spanning from 10,700+95 to 10,880+95 yr B.P.
The fans grew seaward for some kilometres off the modern shoreline, while the fan apexes are found as far as 5-10 km upstream the modern river mouths. The higher the fan relief, the greater the gravel supply from the drainage basin and, in turn, the gravel availability was a function of the amount in the drainage basin of resistant rock outcrops. The eustatic sea level rise accounts for the erosional removing of a large part of the downstream portions of the coastal fans; only the apex areas, extended within the river valleys, have been