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occupy. How this affects the diversity and structure of local macrofaunal assemblages is the object of a further research line. Preliminary data on major taxa such as polychaetes indicate that *C. racemosa* may act as an engineering species impacting the structure of soft-bottom communities.
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W10-96 Orale Burca, Mihai

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ESTIMATION OF THE PHYSICAL PUMP FUNCTIONING IN THE NORTHERN ADRIATIC SEA

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Key terms: Northern Adriatic Sea,; monthly climatology; mixed layer depth

In the framework of the VECTOR project ("VuinErabilità delle Coste e degli ecosistemi marini italiani ai cambiamenti climaTici e loro ruolO nei cicli del caRbonio mediterraneo") the vertical mixing efficiency is studied in the shelf area of the Northern Adriatic Sea. In this relatively shallow area (depths are < 50 m) two major competing buoyancy forces are at work: fresh water discharge and winter cooling. The latter induce formation of the dense water, which consequently spreads toward the south.
The study zone has been spatially divided into cells of 12' x 12' degrees longitude-latitude. On the basis of available temperature (T) and salinity (S) data, collected by various projects, a corresponding density (σ) profiles have been calculated. Monthly climatological profiles were then determined in each cell for each of the three parameters. They were subsampled at regular depths every 2 m from surface down to 20 m, and every 5 m from 20 m down to the bottom. The climatological profile of the three parameters consists of the mean value, the number of data used, and variance at each subsampled depth. The horizontal distribution of the mean monthly T, S, and σ are presented at four selected depths, 2, 5, 10 m and bottom.
Mean annual salinity and temperature distributions in the surface layer are characterised by a front between fresher and colder waters in the east and saltier and warmer waters in the west, according to the thermohaline cyclonic circulation in the basin. At the monthly scale, both parameters show high variability. In particular, during December, January and February, east-west gradient of T and S is strongly evident, indicating colder and fresher waters confined along the western coast. During the warm season (May-July) the surface layer is more uniform in temperature, while the path of fresh water spreads eastward.
In the bottom layer the temperature distribution for the whole year ranges between 6.95 and 23.25 °C. The salinity distribution throughout the year is relatively uniform, ranging between 35.1 and 38.6, except downstream the Po River where it can drop down to 25.12. The temperature field during the winter period is characterized by colder water in the shallow coastal regions with respect to a warmer offshore area. On the contrary, during the summer season shallow near-shore waters are warmer than the rest of the basin, where the thermocline does not reach the bottom.
From individual density profiles in each cell, mixed layer depth (MLD) is computed using the difference criteria, with the density variation $\Delta\sigma$ = 0.06 kg/m3. Subsequently, the mean MLDs are calculated, and compared to the total bottom depth. The MLD evolution at monthly scale is mapped over the study region. Moreover, the MLD is analysed individually during several particular buoyancy forcing conditions, more and less favourable for vertical homogenization of the water column over the shelf.

W10-97 Poster Busetti, Martina

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THE MORPHOLOGICAL AND SEISMIC STRATIGRAPHIC CHARACTERIZATION OF THE GRADO AND MARANO LAGOON (NORTHERN ADRIATIC)

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Key terms: Grado and Marano Lagoon; seismic stratigraphy; morpho-bathymetry

The Grado and Marano Lagoon, located along the Northern Adriatic coast, extends from the Tagliamento to the Isonzo Rivers for about 50 km, covering an area of about 160 km2. The lagoon is protected from the sea by the sand banks and 1 km northward, by islands distributed in an arch shape separated by mouths.
The lagoon probably formed about 5500 ys BP in the western part (Marano Lagoon), and further, about 1000 ys BP to East (Grado Lagoon). The development of the Grado Lagoon is probably related to the diversion of the Isonzo River from the area of Grado to its present position eastward.
The present evolutionary trend at century scale, due to the actual transgressive regime, is constituted by progressive translation of the whole system of islands and sand banks toward the land.
The Grado and Marano Lagoon is a moderately antrophized system, still having the possibility of natural evolution. For this reason it has been choose as one of the study sites where investigate the vulnerability of coastal environment induced by climatic and sea level changes.
To study the relationship between sea level rise and the response of the lagoon system, multi and single channel seismic profiles have been acquired from very high to intermediate resolution in order to investigate the Holocene and Pleistocene evolution of the area. Three profiles of multichannel intermediate resolution have been acquired from land to lagoon. Moreover morpho-bathymetric data have been collected in key areas.

W10-98 Orale Cardin, Vanessa

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DECADAL TREND OF THERMOHALINE PROPERTIES IN THE SOUTHERN ADRIATIC AND REMOTE FORCING

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Key terms: Adriatic Sea; deep convection; current field

Hydrographic observations conducted during the first year of the VECTOR project depict a change of a trend, if compare to what was observed during the past decade. The observations highlight the importance of the intermediate waters and confirmed the dominating prevalence of the highly saline Levantine Intermediate Water, which seems to have replace the Cretan Intermediate Water after 2003 in the layer below 600m.
The open-ocean vertical convection has been considered as the most important mechanism in forming the Adriatic Dense Water (AdDW) which then becomes the prevailing component of the Eastern Mediterranean Deep Water (EMDW). This process takes place in the South Adriatic Pit in the centre of the cyclonic gyre (1). The extension of the vertical mixing, which rarely in the last 15 years has reached the bottom layer, varies on the interannual and decadal time-scales in function of the air-sea heat fluxes and the pre-conditioning vertical density structure (2).
In the last decade (1997-2007) in the South Adriatic Pit, the average temperature of the water column in the layer between 200 and 800m has increased in average by about 0.5 C. This increase, although weaker, started already in 1991. During the last decade, the maximum average temperature was reached in 2003 a value of 13.7°C, much higher than 12.9°C as observed in 1997. After 2003 a decrease in the deeper layers temperature is observed. In parallel, an increase in average salinity by about 0.12 has also been documented (being more intense after 2003) but maintaining this tendency also until 2006 and then showing slight decrease. The increase in temperature and salinity resulted in a decrease in density between 1997 and 2003 indicating that the influence of temperature prevailed in determining the density and that the lighter water filled up the deep layers of the South Adriatic Pit. After 2003 the densest water of the last decade occupied the layer between 200 and 800 m probably due to extremely high salinity.
The deep layer considered the one below 800 m depth (Otranto Sill depth) shows that before 2006, was filled by the ADW (Adriatic Deep Water) from local origin characterised by higher temperature and salinity, while afterwards the deep layers seem to be prevalently ventilated by dense waters coming from the northern Adriatic. This fact is confirmed by the decrease in both temperature and salinity.
After 2003, the intermediate layer in the Pit shows strong changes in its well-known characteristics, previously filled by the Levantine Intermediate Water (LIW), evidenced by the intermediate salinity maximum (S > 38.76). Presently in this layer of the area a new warmer water mass with even higher salt content is present and could be traced back in the Ionian/Cretan Sea. This water mass can be responsible for the recent increase in ventilation of the Adriatic since it provides a source of salt needed to intensify the convection process.
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W10-99 Poster Caroppo, Carmela

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CYANOBACTERIAL DIVERSITY AND POTENTIALLY TOXIC SPECIES IN THE MAR PICCOLO OF TARANTO (NORTHERN IONIAN SEA)

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Key terms: cyanobacteria; toxic species; Mar Piccolo

arine cyanobacteria are found in all the oceans of the worlds, in a variety of forms which may differ among seasons and geographical locations (Schopf, 1996; Golubic et al., 1999). Illuminated coastal sediments normally host cyanobacterial communities (Golubic et al., 1999), so that benthic cyanobacteria are also sporadically found in the water column, because of physical processes such as wave action. Only a few cyanobacterial forms occupy pelagic environments, since they are represented almost exclusively by the two picoplanktonic genera Synechococcus (Waterbury et al., 1979) and *Prochlorococcus* (Chisholm et al., 1988; Urbach et al., 1992).
On the basis of these considerations, we focussed our study in Mar Piccolo of Taranto (Northern Ionian Sea) to assess, over an annual cycle the culturable filamentous cyanobacterial abundances and taxonomy. Furthermore the presence of the potentially toxic cyanobacterial species was also monitored.

The seawater samples were concentrated 200 times by filtration on a 0.45 µm pore size membrane filter and were plated on solid seawater-enriched medium (De Philippis et al., 1993). The cultures were incubated at 26 ± 2 °C under white fluorescent light at a photosynthetic photon flux abundance of 20 µmol photon $m^{-2} s^{-1}$ (Kana & Glibert, 1987). The isolated cyanobacteria were identified according to Komárek & Anagnostidis (1999; 2005) and Castenholz (2001).
Results evidenced that, in addition to the typical picoplanktonic Synechococcus, the culture techniques allowed us to isolate and identify cyanobacteria belonging to the oscillatoriacean genera *Geitlerinema, Leptolyngbya, Oscillatoria* and *Spirulina*. Even if these filamentous morphotypes represent a minor fraction of the total cyanobacterial community, their importance could be related to their contribution to the phytoplankton diversity.
Among the cyanobacterial species, the presence of a potentially toxic species Oscillatoria nigro-viridis must be underlined, taking into account the intense musselculture activities which take place in the Mar Piccolo of Taranto.