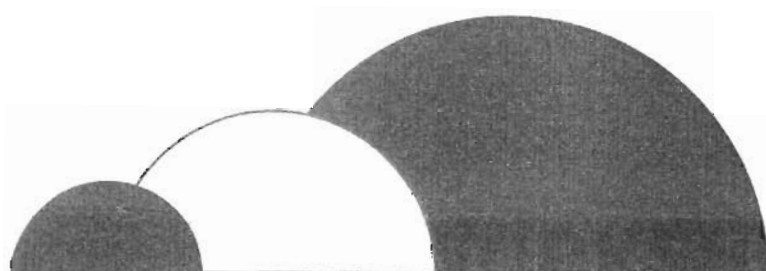


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F I S T

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- swath bathymetry and acoustic mosaics of the seabed, calibrated by sediment sampling and analysis to delineate the present day distribution of the main lithofacies associations and the algal and marine plants coverage;
 - statistical analysis of the main benthic foraminiferal species distribution, to provide information on ecological niches, since it has been observed that specific faunas, do colonize well distinct environments.
 All the information concurred to define four peculiar shallow marine environments:
 - a submerged beach and a fluvial delta sector, wave dominated, down to 15/18 m of depth;
 - a sandy pelitic seabed from 15/18 m down to about 30 at places with patches of *Cymodocea nodosa* and *Caulerpa racemosa*, mainly controlled by extreme storm events and bottom currents;
 - an homogeneous pelitic seabed down to 50 m of depth, swept by bottom currents;
 - a littoral sector characterized by rocky outcrops and relict of *Posidonia oceanica* matte, between 10 and 20 m off the coast enclosed by the Salso and the Solofrone river.

outer sand banks, detached from the ancient and fixed inner barrier, to form a para-lagoonal intermediate area.
 Onshore movement and connection to the inner barrier is the secular trend of the main sand banks, thus testifying an overall rollover tendency possibly due to relative sea-level rise.
 In a sediment-starved system the rollover process not necessarily occurs with mass conservation.
 Barrier thinning and shoreline erosional trend can be seen as the main responses due to flooding of the coastal area without sufficient sediment compensation.
 A GIS-based coastal vulnerability index has been constructed using a multiple regression procedure that considers a set of coastal morphodynamic and physical factors. The present beach configuration as well as the recent shoreline and shoreface evolutionary trends are the main variables to consider in order to achieve information on the possible behavior of beaches and barrier island systems to sea-level rise and climate-changes.
 The procedure permitted to obtain a simple coastal zoning that emphasize the most critical areas, that could become the main erosional hot spots in case of submergence and concomitant recurrence of storms.

W10-115 Poster Fonda Umani, Serena

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CARBON CYCLE VARIABILITY IN THE NORTHERN ADRIATIC ECOSYSTEM: A RE-ANALYSIS OF HISTORICAL DATA

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Key terms: Carbon cycle; northern Adriatic; variability

The northern Adriatic has been recognized for many years as a region of high marine production at several trophic levels from phytoplankton to fish. The rivers draining into the northern Adriatic are the major sources of external nutrient input, especially during stratified periods. The water mass exchange between the northern region and the remainder of the essentially oligotrophic Adriatic has a great influence on the productivity and standing crops of different sub-areas. A terrigenous supply of nutrients all along the western coast via run-off influences the productivity of a relatively narrow coastal belt, and consequently the biomasses and production rates are spatially very variable. In shallow turbulent environments, like the northern Adriatic, where increased nutrient availability is episodic, the microbial or the grazing food web can alternately dominate in the carbon flow over short time periods. In spring, as a result of episodic nutrient enrichment of the euphotic zone and insufficient grazing, as a controlling factor of their population size, large-sized phytoplankton blooms occur that consequently determine a major export to the bottom via sedimentation. On the opposite, microbial food web is typical of low energy environment, mostly based on regeneration processes. As a consequence, the final fate of photosynthesised carbon can strongly change over time in the same environment as a function of the planktonic food web structures. In the framework of VECTOR project ("Vulnerabilità delle Coste e degli ecosistemi marini italiani ai cambiamenti climatici e loro ruolo nei cicli del carbonio mediterraneo") a re-analysis of the entire available data set of parameters relevant in driving C fluxes and export rates has been planned to provide conceptual models and appropriate parametrizations to modelers, with the aim to hindcast and forecast ecosystem scenarios at the basin scale.

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W10-116 Orale Fontolan, Giorgio

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COASTAL VULNERABILITY ASSESSMENT: THE GRADO AND MARANO BARRIER ISLANDS

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Key terms: coastal vulnerability; risk assessment; sea-level rise; storm surge; Grado and Marano lagoons

Maximum vulnerability is normally considered for the lowest parts of the coastal system, as the barrier islands and subsiding deltaic areas. Inundation risk of the Grado and Marano lagoons depends on the elevation of the inner plain and on land use values. Most of the area surrounding the inner lagoon is below the mean sea-level, and is presently defended only by dikes constructed along the inner lagoon margin after the November, 1966 storm. Two main tourism localities (Lignano and Grado), as well as an important industrial area (Porto Nogaro) and significant agricultural and commercial activities are presently the main targets due to sea-level rise.

A twofold adaptation measure has to be considered: 1) a measure linked to the possible expansion of the lagoon limit landwards, in order to compensate for the unavoidable drowning of the present lagoon, 2) a measure linked to the defense of the barrier islands, in order to abate the erosional phenomena that could lead to the opening and loss of the entire lagoons, and reduce the direct impact of storms.

The lagoon has a double barrier island chain, given by dynamic and elongate

W10-117 Poster Galati, Maria Barbara

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MEDITERRANEAN WAVE CLIMATE: VARIABILITY AND TREND

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Key terms: wind waves; extremes; trend; seasonal cycles; climate

This contribution analyses the wave fields in the Mediterranean Sea, during the second half of the 20th century (1958-2001), in order to study the climate variability of SWH (*Significant Wave Height*) and its recent trend. The results are important for planning and managing coastal defences and off-shore activities. In this study, the SWH fields are produced by a third-generation wave model, WAM (*Wave Model*), at 0.25 degs lat-lon resolution. The two sets of forcing wind fields used are provided by the ERA-40 reanalysis and the HIPOCAS project. ERA-40 have a 0.5 deg grid step and a temporal resolution of 6 hours. The HIPOCAS have the same grid step and a hourly temporal resolution. Output wave parameters fields (SWH and direction) are saved every hour. The comparison between the two simulations and with satellite is used for assessing the accuracy of the results. The project aims at describing the mean wave fields, their seasonal cycles, extreme values and climate trend.

W10-118 Orale Gambaro, Andrea

10.1474/Epitome.02.0118.Geotalia2007

STUDY OF ORGANIC SULPHUR COMPOUNDS (DMS, DMSP AND DMSO) IN LAGOON ECOSYSTEMS: THE CASE OF THE VENICE LAGOON

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Key terms: Dimethyl sulphide; Dimethylsulphoniopropionate; water; climate change; Venice Lagoon

During the past decade much of the research on volatile sulphur compounds (VSCs) has focused on their production and fate in the oceans and coastal marine environments. This intense interest arises from an awareness that biogenic sulphur gases play an important role in the cycling of sulphur and in global climate regulation. Dimethyl sulphide (DMS) is the most important marine source of sulphur released into the atmosphere.

The Venice lagoon is the largest wetland of the Mediterranean and it is characterised by different subsystems which determine its elevated complexity and diversity. It can be considered an ecosystem of transition between land and sea, which continuously exchange matter and energy with the drainage basin and the Adriatic Sea.

This study of the origin and fate of dimethyl sulphide (DMS) and the relationship with climate in a particular and complex lagoon ecosystem such as that of the Venice lagoon focuses on the temporal evolutions of DMS concentrations in surface water together with those of dimethylsulphoniopropionate (DMSP), dimethyl sulphoxide (DMSO), nutrients (nitrate, nitrite, ammonium, phosphate, silicate), chlorophyll a, chlorinity, water temperature and phytoplankton (composition and density). Measurements were made during 1997 at six stations in the Venice lagoon. The temporal trends of DMS concentration were different at the six stations and they showed no relation to DMSP or to the chlorophyll a concentration at four stations whereas at two stations DMSP concentrations in the surface water is related to DMS and chlorophyll a concentrations suggesting that the production and the fate of DMS could be different for the two periods.

W10-119 Orale Gasparini, Gian Pietro

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HYDROGRAPHIC AND TRANSPORT VARIABILITY IN THE SICILY STRAIT

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Key terms: Hydrography; Transport; Sicily Strait

The Sicily strait is a key point to observe the exchanges between the eastern

and western Mediterranean basin, both in term of water masses and their associated properties. Variations of volume and of hydrographic characteristics can induce important modification in the adjacent basins. This is particularly evident during the last 15 years, when the Eastern Mediterranean Transient (EMT), reached the Strait and propagated in the Western Basin.

The effects of the EMT in the eastern basin are far to be concluded and its perturbation still propagate through the Sicily strait. In previous works, different characteristics and phases of propagation have been described. Changes in the hydrographic conditions went to modify firstly the deep layer and successively the intermediate. Recently, starting from 2006, a new deep phase seems to be active in the Strait. A denser water was observed to cross the western sill, sinking at greater depth when reached the Tyrrhenian sea. Two currentmeter moorings, positioned in correspondence of the western sill of the Strait, are maintained for a long term monitoring of water mass exchanges through the Strait. The principal time scales have been investigated together with the response to the wind forcing. Transport has been estimated along the examined period and related to the hydrographic conditions.

W10-120 Poster Ghezzi, Michol

10.1474/Epitome.02.0120.Geoitalia2007

MODELLING HYDRODYNAMICS AND WATER QUALITY OF THE TARANTO SEA: EARLY RESULTS

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Key terms: numerical model; Taranto sea; hydrodynamic; water quality

The Taranto sea (Mar Grande and Mar Piccolo) is a remarkable site for trading, strategical and ecological aspects. It is divided into two sub-basins: the Mar Grande and the Mar Piccolo connected to the sea and one each other by the First Inlet and the Second Inlet. The Northern-most area of the Mar Piccolo and the south-eastern area of the Second Inlet are subjected to environmental safeguarding restrictions.

Informations about the physical and biochemical processes that drive the ecosystem have been provided by bibliographic data. We have applied the hydrodynamic and water quality modules of the numerical model SHYFEM-EUTRO to study some features of this site. The SHYFEM-EUTRO is a well tested numerical model already adopted to study coastal areas characterized by complex bathymetry.

We analysed the available meteorological data of this site in order to evaluate the most frequent wind intensities and directions in the Taranto sea. The model have been applied in bi-dimensional version with realistic forcings in order to study the spatial and temporal variability of the velocity fields in the monthly time scale. Other similar simulations lasting one full year have been carried out to examine the seasonal evolution of the temperature, salinity, chlorophyll a and zooplankton fields.

We compared the numerical results of hydrodynamical and ecological variables with available bibliographical data. In particular results about temperature, salinity and chlorophyll have been compared with spatially averaged data for the three different basins. From an hydrodynamic standpoint the current velocity is generally low and mainly influenced by the wind action. In particular, in the Second Inlet of the Mar Piccolo, where the hydrodynamic activities is generally low, the southern wind can often strengthen the water circulation. The model can suitably simulate the evolution of the temperature field but overestimates the salinity, particularly in the Second Inlets, probably due to unknown fresh water input. What concerns the water quality, the model can reproduce the spatial and temporal variability of the phytoplankton and zooplankton dynamics but it is not able to fit appropriately the measurements. This preliminary results shows some critical points: the quality and the quantity of input data need to be improved, some assumptions of the setup of the hydrodynamical model of the basin should be re-evaluated (barotropic system) and some aspects of the water quality code could not be adequate for the Taranto Sea.

The future developments of this work will be to estimate the different inputs for the system and to compare the hydrodynamical results with velocity or level measurements in order to validate the circulation field. The availability of long and complete ecological data timeseries will allow the calibration of some ecological variables and eventually to develop some parts of the code to adapt it to the Taranto sea features.

W10-121 Orale Giani, Michele

10.1474/Epitome.02.0121.Geoitalia2007

FLUXES OF SETTLING PARTICULATE MATTER AND ORGANIC CARBON IN THE ADRIATIC SHELF: A REVIEW OF EXISTING DATA

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Key terms: Organic carbon; settling particulate matter; Adriatic sea

The waters overlying the Adriatic shelf receive the contribution of the riverine discharges and are among the most productive areas of the Mediterranean Sea. The fluxes of settling particulate matter are elevated and contribute to the sustenance of benthic fauna (e.g.: filter and suspension feeders) and to the bacterial activity whereas only a fraction is definitively buried.

In the framework of the VECTOR project a review of the published data on particulate matter fluxes toward the Adriatic shelf sediments measured by sediment traps and a census of the most significant metadata available has

been carried out.

The analysed data regard coastal areas (in front of Po, Adige and Sile rivers), a offshore station (20 nautical miles E from Chioggia) and a station in the gulf of Trieste.

The considered parameters concern the fluxes of particulate matter and of organic carbon, nitrogen and phosphorus.

The settling fluxes of organic carbon were compared with the primary production, where available, to estimate the carbon exported and the importance of advective transport and resuspension processes were also evaluated.

W10-122 Poster Giani, Michele

10.1474/Epitome.02.0122.Geoitalia2007

TOWARD A SEDIMENTARY ORGANIC CARBON BUDGET FOR THE WESTERN ADRIATIC SEA

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Key terms: Adriatic continental shelf; sediment; organic carbon; mass balance; data review

The extent of the settling particulate organic carbon (OC) that escapes resuspension and bacterial degradation is ultimately buried and will be partially preserved in the sediments. Therefore, they act as a sink for the fraction of CO₂ fixed by primary production. The estimate of the OC burial in the western Adriatic continental shelf can be considered as a first step toward the calculation of a global carbon budget for the Adriatic. In this regard, a review of all available OC data has been undertaken in the framework of VECTOR project. The coupling between OC contents in surficial sediment and mass accumulation rates allows to estimate the sedimentary OC mass balance.

In the last 20 years, mass accumulation rates were obtained from 210Pb and 137Cs activity-depth profiles in a suite of papers with different purposes. Among these, Frignani et al. (2005) and Palinkas et al. (2006, 2007) show the most extended areal coverage (>210 sites). On the other hand, OC contents in sediments were measured over the years to assess sediment composition and biogeochemical characteristics, estimate the effects of eutrophication and understand the relationships with pollutant concentrations. In particular, within the PRISMA1 project, OC contents were determined in surface and subsurface sediments covering an extensive area of the Adriatic platform. High concentrations were found especially in the western part of the Adriatic shelf both due to the elevated allochthonous inputs, mainly through riverine discharges and primary and secondary production. Furthermore, OC content and isotopic composition of were used as tracers of the riverine contribution to the Adriatic shelf sedimentation in the framework of US- and EU-funded projects EUROSTRATIFORM (2000-2005). Several oceanographic cruises, carried out to study the subaqueous delta of the Po River and the north and middle Adriatic shelf, allowed the collection and analysis of 430 surface sediment and 823 suspended particulate matter samples. Major results have been discussed in Tesi et al. (2006, 2007) and Miserocchi et al. (2007).

W10-123 Poster Giorgetti, Alessandra

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THE PAN-EUROPEAN INFRASTRUCTURE FOR OCEAN DATA MANAGEMENT INCLUDES VECTOR META-DATA

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Key terms: Interoperability; distributed; marine data management; meta-data

SeaDataNet EU-funded project (2006 - 2010) is developing basic tools for implementing the data management activities in conformity with internationally agreed protocols. It aims to improve the level of quality, the long term assistance and the accessibility of marine data. A distributed pan-European infrastructure for marine data management networks the existing National Oceanographic Data Centres, Satellite Data Centres and Modeling Centres from nearby all coastal states bordering the European seas. It provides through a unique portal integrated on-line access to comprehensive, standardized and validated in-situ and remote sensing marine data, meta-data and products. The development and adoption of common communication standards (common formats and vocabularies for data and meta-data), of discovery, transformation, downloading and viewing services will ensure the Centres interoperability.

OGS/NODC information system is one of the interoperable nodes linked to the infrastructure, adopting standardized methodologies and technology for quality control, data and meta-data distribution. OGS/NODC maintains a catalogue service, aiming at facilitating marine data searching, location and retrieval, containing different levels of data and information (meta-data). This includes the ROSCOP/Cruise Summary Report inventory, the pan-European Directory of Marine Environmental Data, the more recent European Directory of the Ocean Observing Systems. All the meta-data are public and accessible through OGS/NODC on-line server, while the access to the measured data follows a Data Policy, defined by the data providers.

The Vector field activities are constantly included in the high level pan-European inventories available through OGS/NODC and SeaDataNet Web Portals.

W10-124 Orale Giuseppe, Civitarese

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SEASONAL AND INTERANNUAL VARIABILITY OF THE OCEANOGRAPHIC PROPERTIES IN THE SOUTHERN ADRIATIC (VECTOR ACTIVITY 8.1).

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