

- 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* mat, between 10 and 20 m off the coast enclosed by the Salso and the Solofrone river.

W10-115 Poster Fonda Umani, Serena

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

FONDA UMANI Serena¹, RAVAIOLI Mariangela², KOVACEVIC V.³, CARDIN Vanessa⁴, COZZI S.⁴, GIANI Michele⁵, CATALETTO Bruno⁶, SOCAL Giorgio⁷, SAGGIOMO V.⁸, RUSSO Aniello⁹, et al.

- 1 - Dipartimento di Biologia, Università degli Studi di Trieste
- 2 - ISMAR CNR Sezione di Bologna
- 3 - Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS; Trieste
- 4 - ISMAR - CNR Sezione di Trieste
- 5 - ICRAM, Brondolo Chioggia (Ve)
- 6 - ISMAR - CNR Sezione di Venezia
- 7 - Stazione Zoologica "A. Dohrn", Napoli
- 8 - Dipartimento di Scienze del Mare - Università Politecnica delle Marche, Ancona

Presenter e-mail: labbioma@units.it

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.

Authors indicated as et al.:

- M. Crisciani¹, F. Spagnoli¹, A. Boldrin¹, A. Schirone¹⁰, E. Paschini¹, R. Danovaro¹, B. Manca¹, R. Del Fanti¹, A. Pugnetti¹
 9: ISMAR - CNR Sezione di Ancona
 10: ENEA Centro Ricerche Ambiente Marino, La Spezia

W10-116 Orale Fontolan, Giorgio

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COASTAL VULNERABILITY ASSESSMENT: THE GRADO AND MARANO BARRIER ISLANDS

FONTOLAN Giorgio¹, PILLON Simone¹, BEZZI Annelore¹, DELLI QUADRI Francesca¹, BURLA Ivo²

- 1 - Università di Trieste, DISGAM - Coastal Group
- 2 - Università di Trieste, DISGAM

Presenter e-mail: fontolan@units.it

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

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.

W10-117 Poster Galati, Maria Barbara

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MEDITERRANEAN WAVE CLIMATE: VARIABILITY AND TREND

GALATI Maria Barbara¹, LIONELLO P.¹

1 - Univ. of Salento, Lecce, Italy

Presenter e-mail: mariabarbara.galati@unife.it

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

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

GAMBARO Andrea¹, BENITEZ MACIAS I A.², CORAMI F.³, CESCONE P.⁴

1 - Dipartimento di Scienze Ambientali, Università Ca' Foscari, Dorsoduro 2137, I-30123 Venezia (Italy) and Istituto per la Dinamica dei Processi Ambientali, IDPA-CNR, Dorsoduro, 2137, 30123, Venezia

2 - Dipartimento di Scienze Ambientali, Università Ca' Foscari, Dorsoduro 2137, I-30123 Venezia

3 - Istituto per la Dinamica dei Processi Ambientali, IDPA-CNR, Dorsoduro, 2137, 30123, Venezia, and Istituto per la Dinamica dei Processi Ambientali, IDPA-CNR, Dorsoduro, 2137, 30123, Venezia

Presenter e-mail: gambaro@unive.it

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

GASPARINI Gian Pietro¹, SPARNOCCHIA S.², SCHRÖDER K.¹, VETRANO A.¹

1 - CNR - ISMAR, sezione territoriale della Spezia, Forte Santa Teresa, 19036 Pozzuolo di Lerici

2 - CNR - ISMAR, sezione territoriale di Trieste, Viale R. Gessi 2, 34123 Trieste

Presenter e-mail: gasparini@sp.ismar.cnr.it

Key terms: Hydrography; Transport; Sicily Strait

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