

Curl of the Bora-Wind and Ekman Pumping in the Southern Adriatic

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Analyzing the vertical distribution of salinity data collected in the southern Adriatic during the October 1985 (POEM 01) cruise, the occurrence of a subsurface salinity minimum at the level of the seasonal thermocline was documented. The layer of the subsurface salinity minimum coincided with the maximum of the dissolved oxygen suggesting that ventilation processes have had probably taken place. A possible explanation was that the ventilation was due to the Ekman pumping produced by the curl in the bora-wind field. From the wind measurement data at one location in the Adriatic it was evidenced that the bora-wind was blowing for about ten days prior to the sampling interval. The bora-wind field reconstructed on the basis of the climatological data, suggested the occurrence of areas of alternating positive or negative Ekman pumping velocities which could generate the subsurface salinity minimum if the area with the downward pumping velocity coincided with the fresh water coastal layer. The nested multilevel model with 25 levels was applied in order to obtain open boundary conditions in Otranto Strait for a 1/24 degree resolution model. The forcing function was steady bora-wind field having a curl of the order of magnitude as obtained from climatological data. Horizontal and vertical distributions of salinity were presented for selected numerical experiments.

Adriatic Sea primary production (Application of Sea-Wifs to a variable primary production system)

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The Northern Adriatic, due to marked eutrophication gradients over a relatively small area, represents a suitable experimental polygon for testing new methods to estimate and monitor primary production. Even if chlorophyll contents in surface water could be inferred from Sea-WIFS, the ultimate long-term goal of the program is to obtain basin-wide estimate of primary production and to assess its fate.

In the years 1978-1986 the spaceborne Coastal Zone Color Scanner (CZCS) made an important contribution, by mapping phytoplankton concentration in the Adriatic Sea. During the same time period numerous series of experimental cruises were carried out in several marine laboratories on the Adriatic coast. The observations, however, were not generally coordinated with the Nimbus transit.

In response to the NASA NRA request for a proposal, a consortium has been formed. It is made up of experts who, in the past, have independently dealt with optical, biological, chemical and physical parameters. They will now carry out a team work for an integrated study of space observations and *in situ* measurements. Details are given below.

The consortium is formed by:

- **Marine Biology Laboratory** represents Osservatorio dell'Alto Adriatico (OAA), and that is formed by: Marine Biology Laboratory (LBM), The International Centre for Theoretical and Applied Ecology (CETA), Institute of Sea Biology - National Research Council (CNR), Marine Biological Station Piran, "The Rudjer Boskovic Institute" Center for Marine Research in Rovinj.

- **Consorzio Ricerche Interdipartimentali di Scienze del Mare (CRISM)**

- the University of Bologna (Departments of Physics and Computer Science)

- the Agusta Systems Company

- the Telespazio Company

In particular, four units of the Osservatorio Alto Adriatico (OAA) formed by: **Marine Biology Laboratory (LBM)** Trieste, Italy; Institute of Sea Biology - National Research Council (CNR), Venezia, Italy; **Marine Biological Station**, Piran, Slovenia; "The Rudjer Boskovic Institute" Center for Marine Research, Rovinj, Croatia; and **Consorzio Ricerche Interdipartimentali di Scienze del Mare (CRISM)**, Bologna, Italy, will be involved in the "Sea-truth" activities. The **Departments of Physics and Computer Science of the University of Bologna**, Bologna, Italy, will develop the bio-optical algorithms. **Telespazio**, Roma, Italy, will be mainly involved in the image processing activities and in providing all the software tools necessary to support this activity. **Agusta Sistemi**, Tradate (VA), Italy will be mainly involved in taking aerial measurement using a Lidar and, if necessary, other airborne instruments. The research project aims at establishing reliable bio-optical algorithms for chlorophyll, suspended and dissolved organic matter based on Sea-WIFS data at estimating primary production of the Adriatic Sea. The Consortium intends to ask the needed endorsement from the Italian Space Agency and the High Authority of the Adriatic Sea.

The following persons have participated at the project:

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