

## NORTH ADRIATIC SEA CRUISE 1982: STD TRIDIMENSIONAL STRUCTURE

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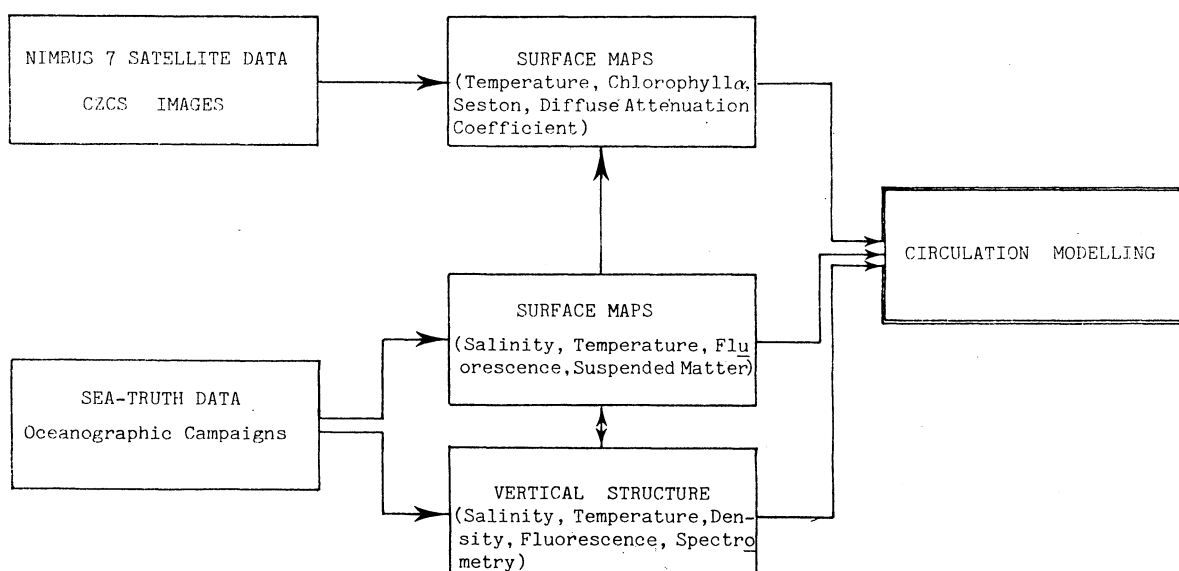
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## Abstract

The procedure used to automatically reconstruct STD structures of the Northern Adriatic with sea-truth data collected during oceanographic campaigns is illustrated.

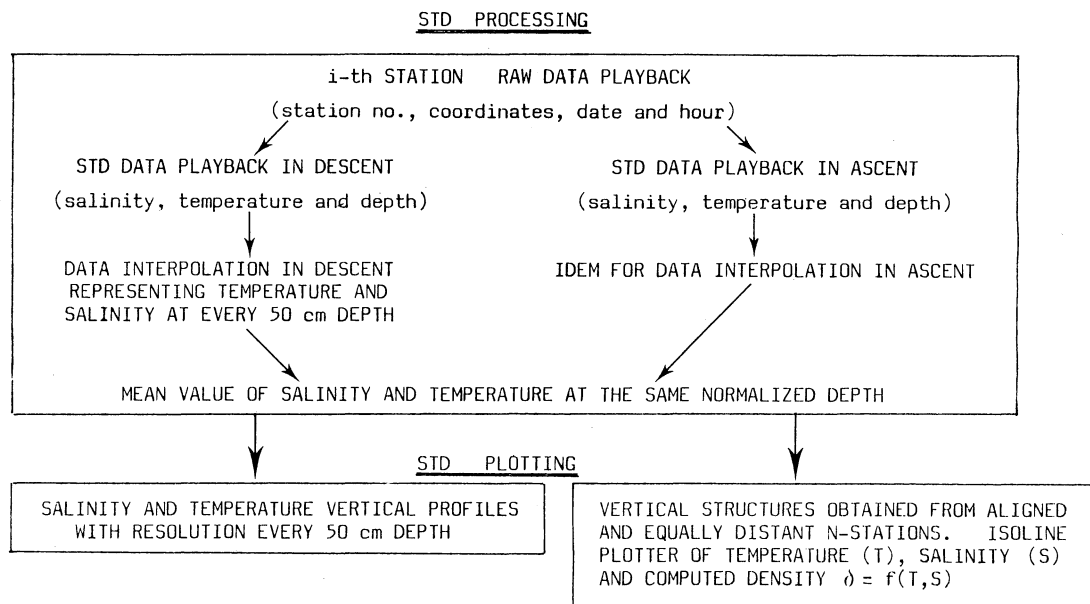
## Introduction

Within the framework of the research program of I.S.D.G.M.-C.N.R., Venice, and in collaboration with J.R.C., Ispra, the CZCS data from Nimbus 7 are used in modeling circulation patterns of the Northern Adriatic Sea. This poster synthesizes a methodology which automatically reproduces marine vertical structures of salinity, temperature and density: the parameters of fluorescence, transmissivity, and underwater downwelling and upwelling irradiance, not shown here, are computed in the same way. The sea-truth data used were recorded during seasonal oceanographic campaigns carried out in 1979 and 1982 and during which the skin layer was continually detected. Distribution maps of the surface are reproduced from the collected data and used in calibrating satellite images. Ship and satellite surface maps and vertical physiochemical structures are the data used in Northern Adriatic circulation models and according to the needs as initial, updated and verification of output data following the scheme below:



### Operation

From an operational point of view, a simple grid with points every 5 miles is used (Fig. 1). At intersecting grid points, continual vertical profiles of STD, fluorescence, turbidity and optical measures with an underwater radiometer are made from an oceanographic ship. To complete the series of measurements, discrete samples are taken to measure chlorophyll *a*, seston and yellow substance. At each station, STD data are collected using an Interocean probe, recorded on magnetic tape and pre-processed according to the following scheme:



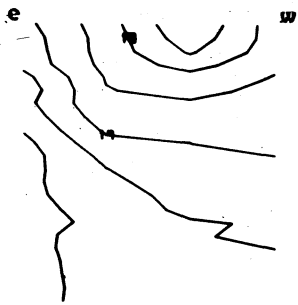
### Application

- Final images give immediate basic information relative to the observation periods in which seasonal layers and frontal systems due to river runoff are quite evident (Figs. 2 and 3).
- A comparison to verify continually measured surface data necessary to interpret remote sensed data, which due to their particular characteristics, are limited to the skin surface.
- Input data to update the circulation model and the final output verification (Fig. 4).

### References

- Malanotte Rizzoli, P., A. Bergamasco, L. Bertotti and L. Cavaleri, 1980. La regione sottocostiera del Nord Adriatico: fenomenologia. La regione sottocostiera del Nord Adriatico: metodologia, In: Atti del IV Congresso A.I.O.L. (Chiavari) 3 dic.
- Malanotte Rizzoli, P. and A. Bergamasco, 1981. Hydrodynamics of the Adriatic Sea, The 13th International Liège Colloquium on Hydrodynamics (ed) J.C.J. Nihoul, Elsevier Scientific Publ. Co., Vol. 34.
- Alberotanza, L. and G. Aldighieri, 1981. 1979-1980 Oceanographic campaigns in the Northern Adriatic, C.N.R.-J.R.C. Report (in press).

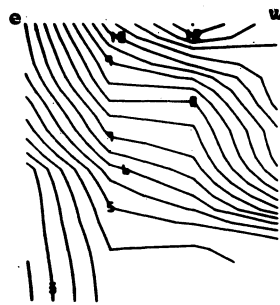




VERTICAL STRUCTURE OF  
SALINITY g/kg  
TRANSECT 7 - 11

CONTOUR

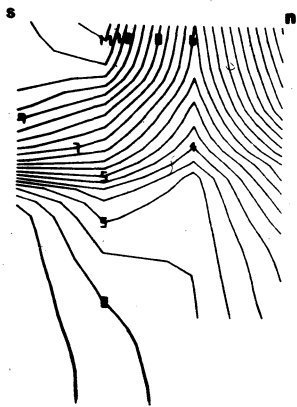
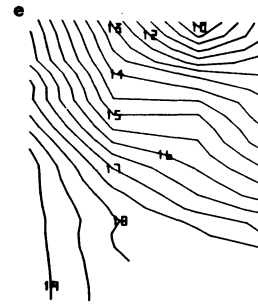
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VERTICAL STRUCTURE OF  
TEMPERATURE C  
TRANSECT 7 - 11

CONTOUR

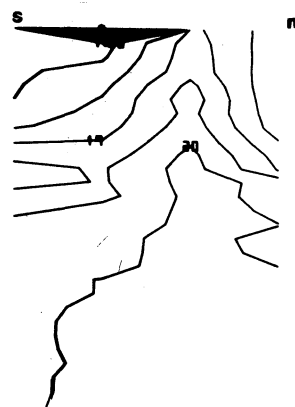
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17	26.00	18	27.00
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21	30.00		



VERTICAL STRUCTURE OF  
TEMPERATURE C  
TRANSECT 5 - 21

CONTOUR

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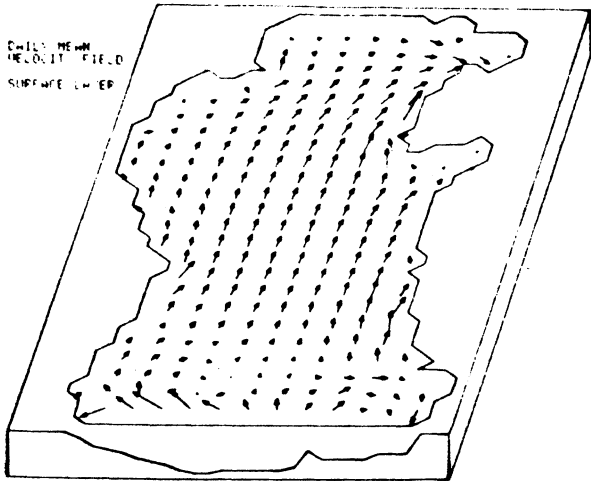
VERTICAL STRUCTURE OF  
SALINITY g/kg  
TRANSECT 5 - 21

CONTOUR

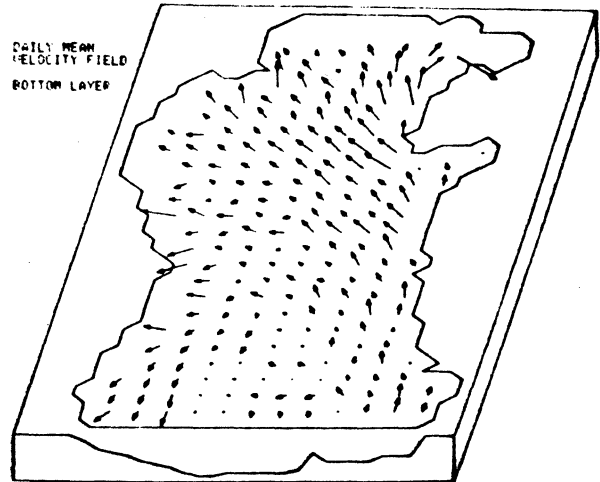
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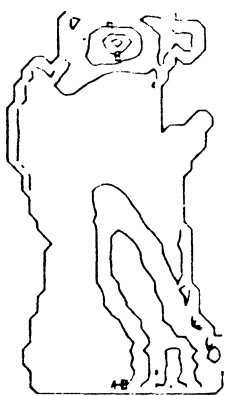
Fig. 3. STD plotting. Temperature, salinity and density (computed) vertical structure computer processed. a) E-W transect, station 7-11, June 1982 oceanographic cruise b) S-N transect, station 5-21, June 1982 oceanographic cruise



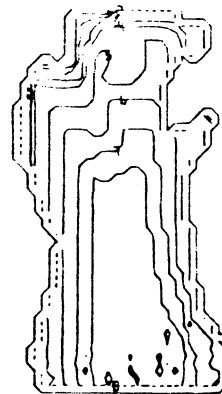
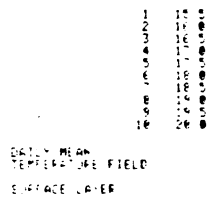
(a)



(b)



(c)



(d)

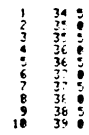


Fig. 4. North Adriatic Sea. A two-layer baroclinic model during the summer period.  
 (a) surface circulation (b) bottom circulation  
 (c) surface temperature distribution (d) surface salinity distribution

