



National Institute  
of Geophysics  
and Volcanology



Italian Ministry of  
Foreign Affairs



Intergovernmental  
Oceanographic  
Commission  
UNESCO



Italian Ministry for the  
Environment and Territory



ALMA MATER STUDIORUM  
University of Bologna  
Environmental Sciences  
Ravenna

# **ADRICOSM-EXTension**

## **Kick-off meeting**

### **22-23 September 2005**

## **Report**

*Meeting place:*

*Università degli Studi di Bologna - Corso di Laurea in Scienze Ambientali  
Aula Magna 2nd floor  
Via S. Alberto 163 and Via dell'Agricoltura 5  
48100 Ravenna*

# FINAL AGENDA

## First day: 22 September 2005

- 09:00 **MEET**
- 09:05 - 09:10 **Welcome by National Institute of Geophysics and Volcanology, Giovanni Coppini**
- 09:10 - 09:20 **Welcome by University of Bologna, Prof. Emilio Tagliavini**
- 09:20 - 09:30 **Welcome by the Italian Ministry of Foreign Affairs (to be confirmed)**
- 09:30 - 09:40 **Welcome by the Italian Ministry for the Environment and Territory, Giovanna Agostinelli**
- 09:40 - 09:50 **Welcome by UNESCO-IOC, Desa Ehrlich**
- 09:50 - 10:15 **Presentation of ADRICOSM Partnership**  
Giovanna Agostinelli - Ministero dell'Ambiente
- 10:15 - 10:45 **Presentation of ADRICOSM pilot project scientific results and presentation of ADRICOSM-EXT Project structure**  
Giovanni Coppini - INGV

### WP0: PROJECT MANAGEMENT

- 10:45 - 11:00 **Task 0.1 and Task 0.2: Scientific coordination and Project reporting and meetings**  
Desa Ehrlich, Joannès Berque- UNESCO-IOC  
Giovanni Coppini – INGV
- 11:00 - 11:15 **Coffee Break**
- 11:15 - 11:30 **Task 0.3: Reporting and Dissemination of Project results**  
Luisella Bianco - CLU
- 11:30 - 11:45 **Discussion**

### WP1: ENHANCEMENT OF ADRICOSM OBSERVATIONAL AND MODELLING NETWORK

#### **Task 1.1: Continuation and improvement of the NRT system for remotely sensed data**

- 11:45 - 12:00 **Subtask 1.1.1: SST; Subtask 1.1.2: Ocean Colour; Subtask 1.1.3: Satellite data products for meteorological sensitivity studies**  
Emanuele Böhm, CNR ISAC with the contribution of HEIS, CNR.ISMAR-Ancona, UNIBE

### **Task 1.2: Continuation and improvement of the VOS XBT monitoring system**

- 12:00 - 12:15**    Subtask 1.2.1: Design of the automatic meteorological station for the VOS-XBT system  
Franco Reseghetti, ENEA.CRAM with the contribution of UNESCO-IOC, OGS, IOF
- 12:15 - 12:30**    Subtask 1.2.2: XBT and continuous ship-borne meteorological measurements along the Ploče-Malta and Dubrovnik-Bari transects  
Vanessa Cardin, OGS with the contribution of IOF, ENEA.CRAM
- 12:30 - 12:45**    ***Discussion***
- 12:45 - 14:15**    ***Lunch***

### **Task 1.3: Implementation of new CTD coastal networks and monitoring stations.**

- 14:15 - 14:30**    Subtask 1.3.1: The Bar-Durrës coastal area seasonal data collection  
Mauro Marini, CNR.ISMAR (Ancona) with the contribution of IBM and HI
- 14:30 - 14:45**    Subtask 1.3.2: Extending the measurement area for CTD and inclusion of optical parameters  
Vlado Dadic, IOF with the contribution of HEIS

### **Task 1.4: New sea level stations in the Southern Adriatic Sea**

- 14:45 - 15:00**    New sea level stations in the Southern Adriatic Sea  
  
Ing. Simonetta Piccinini, APAT with the contribution of UNESCO-IOC, HI
- 15:00 - 15:15**    ***Discussion***

### **Task 1.5: Introduction of new measurements in existing observational areas for training purposes**

- 15:15 - 15:30**    Subtask 1.5.1: Add new ADCP on board of two of the four major ADRICOSM CTD network vessels  
Vanessa Cardin, OGS with the contribution of UNESCO-IOC, ARPA.Daphne, NIB.MBS, RBI.CMR, IOF, HEIS, UNIBE, IBM, HI
- 15:30 – 15:35**    ADCP on board a 12-m vessel and the Coastal Oceanographic Station of NIB-MBS, Branko Cermelj, NIB-MBS
- 15:35 - 15:50**    Subtask 1.5.2: Evaluation of innovative sensors in the Gulf of Trieste monitoring station  
Elena Mauri, OGS with the contribution of IBM
- 15:50 - 16:05**    Subtask 1.5.3: Po river Buoy station  
Mariangela Ravaioli – Sara Piconi, CNR.ISMAR-IGM with the contribution of NIB.MBS, HMI
- 16:05 - 16:20**    **Coffee Break**
- 16:20 – 16:30**    HEIS contribution under Tasks: 1.1, 1.3 and 1.5, Igor Palandzic, HEIS

**16:30 - 16:45**    Subtask 1.5.4: Assessment of primary production in the Gulf of Trieste coastal waters  
Fabio Voltolina, OGS-LBM.TS with the contribution of IBM

**16:45 - 17:00**    **Discussion**

**17:00 - 17:15**    **Task 3.2: Organization of a delayed mode data archiving system for the Adriatic Sea Task 3.5: GIS development for coastal areas of the Adriatic Sea**  
Alessandra Giorgetti, OGS with the contribution of ENEA.CRAM, LBM.TS, NIB.MBS, RBI.CMR, IOF

### **Task 1.6: Improvement of coastal hydrodynamic modelling and new implementations**

**17:15 - 17:30**    Subtask 1.6.1: Improve the coastal forecasting activities in the Split area  
Zoran Pasarić, UZ.AMGI with the contribution of INGV

**17:30 - 17:45**    Subtask 1.6.2: Improvement of coastal forecasting activities in marine area influenced by discharge of Neretva River (Croatia and Bosnia-Herzegovina territories)-High resolution coastal model (COAST) and coastal modelling tools  
Vlado Dadić, IOF with the contribution of APAT and FCE-Mostar

**17:45 - 17:55**    Subtask 1.6.2 Ing. Francesco Lalli, APAT

**17:55 – 18:00**    Improvement of coastal forecasting activities in marine area influenced by discharge of Neretva River, Gordana Beg-Paklar, IOF

**18:00 - 18:15**    Subtask 1.6.3: New coastal model for the Rovinj Area  
Nenad Smodlaka, RBI.CMS with the contribution of INGV (Paolo Oddo)

**18:15 - 18:45**    **Discussion**

## **Second day: 23 September 2005**

**09:00 - 09:15**    **Task 1.7: Atmospheric forcing studies**  
Prof. Borivoj Rajković, UNIBE with the contribution of INGV

**09:15 - 09:30**    **Task 1.8: Continuation of ADRICOSM forecasting activities**  
Paolo Oddo, INGV with the contribution of IOF

**09:30 - 10:00**    **Discussion**

### **WP2: INTEGRATED CATCHMENT SIMULATOR SYSTEM - ICSS FOR A RIVER TEST SITE**

**10:00 - 10:15**    **Task 2.1: Definition of pilot area and mobilization and Task 2.2: Data Collection and Database Implementation**  
Kujtim Bicaku, HI with the contribution of SGI

**10:15 - 10:30**    **Task 2.3: Model set-up and implementation**  
Ing. Alessandro Bettin, SGI with the contribution of HI

**10:30 - 10:55**    **Discussion**

**10:55 - 11:15**    **Coffee Break**

### WP3: DATA MANAGEMENT SYSTEM

- 11:15 - 11:30 **Task 3.1: Organization of NRT data management system for the whole Adriatic Sea**  
Franco Reseghetti and Giuseppe Manzella, ENEA.CRAM with the contribution of UNIBO.CIRSA, ARPA-Daphne, LBM.TS, OGS, NIB.MBS
- 11:30 - 11:45 **Task 3.3: Development of a portal system (LAS) for satellite, in situ and model data output**  
Emanuele Böhm, CNR.ISAC with the contribution of ENEA.CRAM, OGS, UZ.AMGI
- 11:45 - 12:00 **Task 3.4: Data sharing protocols for meteo-marine measurements**  
Ing. Simonetta Piccinini, APAT with the contribution of ENEA.CRAM, HI
- 12:00 - 12:30 ***Discussion***

### WP4: TRAINING AND OUTREACH

- 12:30 - 12:45 **Task 4.1: Workshops and seminars in the field of operational forecasting, ICZM, monitoring, modelling and data assimilation**  
Desa Ehrlich, Joannès Berque, UNESCO-IOC
- 12:45 - 13:00 ***Discussion***
- 13:00 - 14:30 ***Lunch***
- 14:30 - 14:45 **Task 4.2: Mapping techniques for coastal data sets**  
Marco Zavatarelli, UNIBO-CIRSA
- 14:45 - 14:55 ***Discussion***
- 14:55 - 15:10 **Task 4.3: Training course for data management**  
Desa Ehrlich, Joannès Berque, UNESCO-IOC
- 15:10 - 15:20 ***Discussion***
- 15:20 - 15:35 **Task 4.4: Meteo-marine station data management**  
Ing. Simonetta Piccinini, APAT
- 15:35 - 15:45 ***Discussion***
- 15:45 - 16:00 **Task 4.5: Training in ICSS**  
Ing Augusto Pretner and Ing Alessandro Bettin, SGI
- 16:00 - 17.00 ***Discussion***
- 17:00 ***End of the meeting***

# ADRICOSM-EXT kick-off meeting

## REPORT

### First day: 22 September 2005

**09:00**            ***MEET***

**09:05 - 09:10**    ***Welcome by National Institute of Geophysics and Volcanology, Giovanni Coppini***

**09:10 - 09:20**    ***Welcome by University of Bologna, Prof. Emilio Tagliavini***

**09:30 - 09:40**    ***Welcome by the Italian Ministry for the Environment and Territory, Giovanna Agostinelli***

**09:40 - 09:50**    ***Welcome by UNESCO-IOC, Desa Ehrlich***

**09:50 - 10:15**    ***Presentation of ADRICOSM Partnership***

Giovanna Agostinelli - Ministero dell'Ambiente

Giovanna Agostinelli presented the characteristics of the Partnership. The ADRICOSM Partnership is based on the ADRICOSM PP lunched in 2001 within the All. In 2002 in Johannesburg ADRICOSM was adopted as a Type II Initiative. The ADRICOSM Partnership is coordinated by the National Institute of Geophysics and Volcanology (INGV) and involves 35 partners from Italy, France, Slovenia, Croatia, Serbia and Montenegro, Albania and Bosnia-Herzegovina. The projects that belong to the Partnership are: Pilot Project, Extension, Pula Bay, Neres and FHAZAB.

FHAZAB will be coordinated by ARPA-EMR and will be dedicated to forecasting hazardous substance spills in the Adriatic and Baltic Seas.

ADRICOSM will continue to involve new partners, financing and territories.

The link with the activities of the Mediterranean Action Plan within the Barcelona Convention. has been shown.

ADRICOSM contributes to the Mediterranean Forecasting System.

ADRICOSM data contributes to the success of the Regional Contingency Plan in case of accidental marine pollution.

The ADRICOSM Partnership is a "building block" in the MED-Component of the EU Water Initiative.

The ADRICOSM Partnership promotes the implementation of the EU Water Framework Directive.

**10:15 - 10:45**    ***Presentation of ADRICOSM pilot project scientific results and presentation of ADRICOSM-EXT Project structure***

Giovanni Coppini - INGV

Coppini presented the Mediterranean Forecasting System and the sub-regional systems and then gave an overview of ADRICOSM implementation and results. Then he gave examples in order to demonstrate the utility of ADRICOSM products outside of the project's official aims. Finally he presented the ADRICOSM-EXT project structure. Presenting MFS he showed the

MFSTEP Bulletin that every day give a snapshot of the ocean currents and relevant variables. He then presented the MFSTEP sub-regional and shelf systems. Among these systems ADRICOSM demonstrated the feasibility of nowcasting/forecasting at weekly time scales in this critical shelf area and developed coupling with river basin management systems for coastal pollution and marine ecosystem health management. The ADRICOSM large scale Observing System contribution was presented in terms of VOS-XBT and satellite data (SST and Colour). The ADRICOSM observing system coastal monitoring networks were also presented (3 buoy stations, CTD stations in 4 coastal areas, complementing the large scale monitoring and using the same real time dissemination network). The Adriatic current forecast that is published weekly on [www.bo.ingv.it/adricosm](http://www.bo.ingv.it/adricosm) was presented. Applications in support of the Integrated Coastal Zone Management System and operational oil spill modeling were described. Another activity was described which consists of a new observing system which is being developed using fishing vessels. The Fishery Observing System will give the first Real Time spatially and temporally resolved fields of fishing effort and commercial catches to be coupled to marine nowcasts/forecasts.

Finally, ADRICOSM-EXT objectives and structure were presented.

## WP0: PROJECT MANAGEMENT

### 10:45 - 11:00 Task 0.1 and Task 0.2: Scientific coordination and Project reporting and meetings

**Desa Ehrlich, Joannès Berque- UNESCO-IOC**

**Giovanni Coppini – INGV**

Coppini presented the main aim of these 2 tasks, which are:

- Facilitating contractual agreements at the start of the Project
- Defining Project reporting mechanisms and scheduling meetings

Within task 0.1 UNESCO-IOC will provide the overall coordination of the Project and scientific aspects will be coordinated by INGV. The actions to be undertaken within this tasks will be:

- Sub-Contract Agreements (DONE)
- Purchasing of durable equipments
- Communication with partners
- Monitoring of scientific and technological activities

Within task 0.2 UNESCO will coordinate the preparation of six-month management and scientific reports; Management and Scientific and Reports will be prepared by partners using a web tool called PROGETTA.

As far as project meetings are concerned, a kick-off meeting has been organized and Workshops with all Project participants will be organized if needed. The technical meetings needed in several Tasks will be coordinated directly by each partners with the help of UNESCO-IOC.

Activities reports will consists of:

1) by 28 August 2005 at the latest, a short report including the Terms of Reference for the subsidiary contract, a comprehensive definition and technical description of each task, including corresponding deliverables (DONE)

2) Intermediate MANAGEMENT and SCIENTIFIC reports:

by 15 April 2006 at the latest an intermediate technical and scientific report on the progress achieved

3) Final MANAGEMENT and SCIENTIFIC reports:

by 30 September 2006 at the latest - a full activity report covering Partner's contribution to the overall project. The report should cover step-by-step all deliverables described in Annex 1 and assess the impact of obtained results in view of the next phase of the Project.

The financial contribution for the execution of the Project shall be distributed by UNESCO-IOC to the Partners according to the following table:

Payment N°	Upon the submission and approval by UNESCO-IOC of the following work	Latest date for submission	Amount
1	Reporting including terms of reference	28 August 2005	30%
2	Intermediate technical and scientific report	15 April 2006	50%
3	Final activity report	30 September 2006	20%

**11:15 - 11:30**    **Task 0.3: Reporting and Dissemination of Project results**  
**Luisella Bianco - CLU**

Bianco presented PROGETTA and showed the web pages concerning the reporting system and the gant production. Progetta allows an easy submission of reports and allows the status of the tasks and of report submission to be controlled.

Desa Ehrlich suggested that a team for report reviewing should be established to help INGV in this task.

**WP1: ENHANCEMENT OF ADRICOSM OBSERVATIONAL AND MODELLING NETWORK**

**Task 1.1: Continuation and improvement of the NRT system for the remotely sensed data**

**11:45 - 12:00**    **Subtask 1.1.1: SST; Subtask 1.1.2: Ocean Colour; Subtask 1.1.3: Satellite data products for meteorological sensitivity studies**  
**Emanuele Böhm, CNR ISAC with the contribution of HEIS, CNR.ISMAR-Ancona, UNIBE**

The production of the Sea Surface Temperature will continue and new products will be produced using Optimal interpolation techniques. Examples of AREG gridded data have been given. Concerning Ocean Colour CNR-ISAC has been using SeaWiFS data that will be re-processed using ancillary data. SeaWiFS is no longer available and has been replaced with MODIS data. Case I/II water masks and Water clarity will be new products available. The goal is to have enough in situ measurements to calibrate the algorithms. An algorithm has been adjusted for the Mediterranean and now we are reprocessing the entire SeaWiFS dataset; the same could be done for the Adriatic Sea. Diffuse attenuation coefficient is a new product that represents turbidity and indicates the amount of scattering that is taking place in the water column.

Day and night SST for daily cycle depiction will be prepared with the help of the meteorological team. Quikscat winds has been presented. True colour products have been presented and zoom for the Albanian coasts have been presented.

A comparison with EUMetSAT could be interesting.

**Task 1.2: Continuation and improvement of the VOS XBT monitoring system**

**12:00 - 12:15**    **Subtask 1.2.1: Design of the automatic meteorological station for the VOS-XBT system**  
**Franco Reseghetti, ENEA.CRAM with the contribution of UNESCO-IOC, OGS, IOF**

ADRICOSM VOS tracks were presented:

XBT tracks search for (variability of) the circulation in the Southern Adriatic

1. Track 1= Ploče (HR) – Malta (MT)  
(managed by OGS)
2. Track 2= Dubrovnik (HR) – Bari (I)  
(managed by IOF-Split, and ENEA)

The selected spatial sampling (~ 10 km) is nearly coincident with first baroclinic radius of deformation, the temporal sampling (every month) is larger than optimal, but operational difficulties too forbid regular higher frequency.

ADRICOSM-EXT is providing the opportunity to become a real VOS, adding further physical values to XBT temperature profiles; the selected step includes the acquisition of some meteorological

parameters: two ships will be equipped with air temperature, pressure and humidity sensors, one ship will also have wind sensors. As far as the T-P-H sensors are concerned the on-board location of the recording apparatus is of fundamental importance: it has to be selected so as to measure the atmospheric values minimizing the ship's influence, such as sources of heat and humidity.

Wind Sensor:

- The location of the wind sensors is more dramatic than that of other instruments
- In any case, the ship's structures will influence the measurements.
- Fine tuning of the instrument position will be required
- A long-term study on the measured values and on the significance of on-board wind measurements has to be done

Quality Check:

- Existing protocols will offer the basic contribution:
  - a. Broad range check
  - b. Anomalous values (strong instantaneous variations)
  - c. Stability check (values cannot be constant for a long time)

BUT other q.c. will be developed and added "on the road"

Data Transmission:

- The transmission will be based on satellite telecoms
- The apparatus will be provided by sellers
- ADRICOSM partners MUST provide the SIM to sellers
- The transmission cost will be with partners

Future Plans:

- Th-Provide the transmission strategy:
  - a. every hour? every few hours?
  - b. What kind of data: averaged values and extrema?
  - c. also when the ship is in harbour?
  - d. format?
  - e. what q.c. procedure?
- Exp-Visit the ship → find the best location for instruments
  - a. Electric power connection
  - b. "Sky visibility" for the data transmission

A meeting is suggested to plan the activities.

**12:15 - 12:30 Subtask 1.2.2: XBT and continuous ship-borne meteorological measurements along the Ploče-Malta and Dubrovnik-Bari transects  
Vanessa Cardin, OGS with the contribution of IOF, ENEA.CRAM**

The meteo station will be operative on the VOS ship. 10 cruises will be carried out along the 2 tracks. Comparison with ECMWF data will be performed. Statistics and data availability related to the MFSPP and ADRICOSM pilot project were shown. Results and analysis were presented.

Some Conclusions and Remarks were presented:

- Based on XBT data collected along two transects in the Southern Adriatic in the period October 2002 – July 2003 it was possible to obtain the time evolution of the thermal conditions from the pre-conditioning, through winter convection and then spreading phase;
- Pre-conditioning phase was characterized by the intense Ionian/Eastern Mediterranean water inflow and the strengthening of the South Adriatic cyclonic circulation;
- XBT surveys have shown the vertical convection reaching a depth of 600m;

- In the spreading phase starting from early April, the signal of the cold water vein flowing along the Italian shelf break was clearly evident at the Dubrovnik – Bari transect contributing to the strengthening of the South Adriatic Gyre;
- Decadal increase of the average temperature of the upper 700m layer;
- XBT data combined with basin-wide surveys and satellite data can give the right “picture” of the hydrographic conditions of the basin.

**12:45 - 13:00     Subtask 1.3.1: The Bar-Durrës coastal area seasonal data collection  
Mauro Marini, CNR.ISMAR (Ancona) with the contribution of IBM and HI**

Mauro Marini showed the Mareographic station location in Albania.  
The monitoring design for the campaign was presented. (Physical data, chemical data and biological data as well as pollutants) 2 cruises (November 2005 and spring 2006) will be carried out.

Participants to the cruises will be:

- 4     Italian technicians;
- Montenegrin technicians;
- Albanian technicians;
- 1     People of Montenegrin/Albanian institutions

The boat used will be the R/V Dallaporta.

**Task 1.3: Implementation of new CTD coastal networks and monitoring stations.**

**14:30 - 14:45     Subtask 1.3.2: Extending the measurements area for CTD and inclusion of optical parameters**

**Vlado Dadic, IOF with the contribution of HEIS**

ADRICOSM pilot project cdt network and results were presented:

PROFILING was BI-WEEKLY & WEEKLY, the PERIOD of data collection was October 2002 – September 2003. T and S were collected in 14 CTD STATIONS ALONG 3 PROFILES and two meteo stations collected data in SPLIT-MARJAN and AMOS. A climatology was prepared on the basis of the data collected in the stations: OS1 – NERETVA, RIVER ESTUARY, OS8–HVAR, OS9 – VIS, SPLIT-MARJAN, HVAR. Main feature of the monitored zone were described:

“The relatively small area between Drvenik, Hvar and Ploče is characterized by strong thermohaline and colour gradients, due to the high freshwater input from Neretva and Cetina and from nutrient input from the coast. The area is also under periodic influences from the deeper southern Adriatic. Therefore this particular area covers the whole variety of colours: from the very productive areas closer to the river mouth and near urban centres to almost oligotrophic waters under the influences of southern open waters. “

Salinity measurement and air-surface fluxes climatology were presented in terms of Mean seasonal temperature and salinity cycles for the station OS1 and OS8 obtained based on mean monthly values from the period 1961-2000:

- TWO SALINITY MINIMA
- MAY – SPRING NERETVA RIVER MAXIMUM
- NOVEMBER – AUTUMN PRECIPITATION MAXIMUM
- ONE SALINITY MINIMUM
- MAY NERETVA RIVER
- DISCHARGE MAXIMUM

AIR-SEA SURFACE FLUXES climatology was presented: Mean seasonal cycles of surface heat and water fluxes at Hvar and Split and at 4 ECMWF grid points.

Temporal thermohaline variations were described.

The region can be divided in 3 different sub-regions, Categorization of VPD area due to TS properties:

- Neretva estuary waters,
- Channel waters and
- Waters similar to open sea

New additional profiles are needed because:

- 1) Preliminary analysis of CTD data and results have got by ASHELF2 model in Vis-Peljesac-Drvenik area have shown that measurements on existing CTD stations could not give a full answer to the question of influence of Neretva River discharge and wind on complex current figures in the marine testing area.
- 2) Problem is recognizing wind influence blowing from different directions over the complex orography in the wider area of the Neretva Channel
- 3) These measurements will also serve to characterize water masses optically and define euphotic zone depth.

Incorrect simulations and predictions in the part of the ASHELF2 domain influenced by Neretva River were shown.

ADRICOSM-EXT new station was shown.

As far as data collection and availability are concerned:

- Measurements will be made under specific weather situations (after Sirocco and Bora) in different part of the year (during period with mixed and stratified water column and max. and min. Neretva river discharge)
- CTD, optical and currents measurements will help for verification of the 200-metre resolution COAST numerical model to be developed in the framework of the ADRICOSM-EXT program.
- Measurements of optical parameters (with Biospherical Profiling Radiometer) will be made at representative CTD stations across the gradient of optical properties.
- The irradiance attenuation for PAR will be available after each cruise in a delayed mode. Based on analysis of all collected data, a full report will be written.
- Validated data will be analyzed and compared with historical data and data collected during the ADRICOSM project. Analysis of data collected in almost identical oceanographic conditions at 23 stations located on 5 profiles will help us in the reconstruction of the Neretva river's influence on the marine area in the research polygon.

#### **Task 1.4: New sea level stations in the Southern Adriatic Sea**

**14:45 - 15:00      New sea level stations in the Southern Adriatic Sea**  
**Ing. Simonetta Piccinini, APAT with the contribution of UNESCO-IOC, HI**

Task 4.1 "New sea level station in Southern Adriatic sea" activities were presented:

- Implementation of a meteo-marine station on the Albanian coast
- Acquisition and collection of meteo-marine data in electronic data archive located in Albania
- Definition of the administrative programs for ordinary and extraordinary maintenance of the meteo-marine station
- Integration of the new station in the APAT meteo-marine network and dissemination of the data within the Project.

Ing. Piccinini then presented the Italian National Tide Gauge network:

#### **History**

- Data collection of sea level observations started twenty years ago in many sites
- The RMN was restructured and upgraded in 1998

## Objectives

- Measuring sea water level variations and influencing meteorological parameters
- Giving continuous time series at the national scale

A brief description of the network was given:

- 26 tide gauge stations, nearly-real time monitoring network (star architecture) of meteorological and marine data;
- during the day the centre is connected by GSM modem to all the stations on a regular schedule;
- centre performs a preliminary analysis of the data and arranges the information in a data-set.

Active sensors at the stations provide:

- Observations of sea level and water temperature
- Atmospheric data:
  - wind speed and direction
  - atmospheric pressure
  - air temperature

The Aims of the data elaboration centre and archive consist of:

- configuring and monitoring the connection with the stations
- retrieving data and checking the values of the parameters
- elaborating, archiving and graphically displaying the observations recorded

Acquisition of data can be done:

- remotely by GSM modem;
- by reading the local recording log or the memory card.

Remote transmission of data can be made:

- through an automatic procedure of request of data from the national centre;
- through the request of the operator of the national centre;
- from the local station after a technical or operative alert signal.

After data are transmitted to the national centre, parameters are arranged and archived in a relational data-base.

Archiving and export of data - information:

- date and hour of the measurement;
- station;
- sensor;
- measurement;
- elaboration interval;
- quality control.

The station configuration was described:

### Equipment:

1. Solar panels
2. Control unit
3. Measuring instruments
4. Archiving system
5. GSM modem for data transmission

Characteristics: Work autonomously, collect measures from sensors, archive them on hard disk and removable magnetic support

Data output were presented. [www.apat.it](http://www.apat.it) [www.idromare.com](http://www.idromare.com) [www.mareografico.it](http://www.mareografico.it)

Data quality and data analysis activities were presented.

Data from the new ADRICOSM-EXT Sea Level Station will be both available in Albania (HI) and Italy (APAT).

**Task 1.5: Introduction of new measurements in existing observational areas for training purposes**

**15:15 - 15:30    Subtask 1.5.1: Add new ADCP on board of two of the four major ADRICOSM CTD network vessels**

**Vanessa Cardin, OGS with the contribution of UNESCO-IOC, ARPA.Daphne, NIB.MBS, RBI.CMR, IOF, HEIS, UNIBE, IBM, HI**

The presentation was prepared together with IOF and ARPA-EMR Training activities will be carried out. ADCP needed characteristics were described. ADCP will be inserted in ARPA-EMR and IOF monitoring system. The R/V that will mount ADCP was presented. The EMR area will be from the Po river to Cattolica. The monitoring designs were described. Data will be collected monthly for EMR

Examples of the usage of ADCP vessel mounted were given for experiment made in the Venetian Lagoon.

Partners will join OGS in the Venetian Lagoon to learn how the ADCP is working. One or two visits will be made by OGS staff to IOF and EMR in order to finish the training.

**15:30 – 15:35    ADCP on board of a 12-m vessel and the Coastal Oceanographic Station of NIB-MBS, Branko Cermelj, NIB-MBS**

ADCP mounted on board the 12-metre Vessel. Monitoring design was shown. The ADCP was shown during its construction. The problem with this construction is that this construction does not permit a velocity higher than 6 NM. Now NIB-MBS will have a new construction that will be able to be put to sea and removed during the cruises. ADCP versus model results were shown.

**15:35 - 15:50    Subtask 1.5.2: Evaluation of innovative sensors in the Gulf of Trieste monitoring station**

**Elena Mauri, OGS with the contribution of IBM**

Add new technology on the Mambo buoy:

- *new controller* to collect the data from different sensors and transmit the measurements in real time to the off-shore station;

- *new sensors.*

- Produce quality-controlled time series of the measured parameters.
- Organize the training courses.

Configuration of the Mambo Buoy was shown. Innovative changes will be added to the buoy: The new onboard **controller** will manage :

- the data acquisition, the geo-referencing and the first step of the data processing;
- the archive and the real time distribution of the data through GSM network;
- the data acquisition of new added **sensors** :

- a hull-mounted ADCP (providing currentmeter data in the water column);

- profiling sensors (providing water property data, every hour).

Example of the web page that will be soon available.

Bio-optical data set was presented:

The bio-optical data will be provided by the Laboratorio di Biologia Marina and analyzed in conjunction with the time series of the OGS mooring data set:

- Radiances at different wavelength;
- PAR;
- Absorption, beam attenuation, back-scatter coefficients;
- Chlorophyll concentration and other biological parameters.

A Training course on sampling techniques, quality control and analysis of the data will be organized with the collaboration of the Laboratorio di Biologia Marina di Trieste.

**16:30 - 16:45    Subtask 1.5.4: Assessment of primary production in the Gulf of Trieste coastal waters**

**Fabio Voltolina, OGS-LBM.TS with the contribution of IBM**

LBM will become part of OGS in January 2006. LBM work in ADRICOSM-EXT was presented. Assessing primary production is one of the scopes of the work that will be carried out.

As far as Subtask 1.5.4: "Assessment of primary production in the Gulf of Trieste coastal waters" is concerned:

- LBM.TS has been involved since 1998 in the application of the Carbon-14 technique (Steeman-Nielsen, 1952) in the Gulf of Trieste.
- Since 2001, the method has been applied "in situ" and a data-set of phytoplankton standing stock, communities and photosynthetic rate is currently studied in a coastal station.
- Even though "in situ" Carbon-14 technique represents the standard analysis for measuring primary production in the water column, the method applied on a basin-scale presents several methodological problems:
  - The method is laborious and time consuming
  - The method is limited in spatio-temporal resolution
  - The method is expensive
- For these reasons one of the aims of our subtask is to compare the Carbon-14 technique with a bio-optical approach for phytoplankton primary production measurements that may be suitable for long-term monitoring programs (Yoshikawa *et al.*, 2004).
- The assessment of "in situ" primary production with Carbon-14 technique will be performed at two depths, 5 and 10 metres, in coastal station C1 (max depth 17 m).
- Sampling and probe vertical profiles will be acquired at the station during 10 cruises performed in winter and spring-summer period.
- Values of nutrients, pigments, phytoplankton absorption coefficient, P vs E curves and phytoplankton abundance will be assessed from the water samples.
- The estimation of local primary production by means of bio-optical parameters requires the development of an algorithm that takes into account: (1) the scalar irradiance and the upward radiance along the water column, (2) the pigment characteristics of phytoplankton and (3) the parameters of Photosynthesis vs. Irradiance (PvsE) curves.
- 1) Measuring optical properties of the water column: During the "in situ" Carbon-14 incubation period, vertical profiles of PAR irradiance, upwelling radiance (683nm), diffuse attenuation coefficient and total absorption coefficient of seawater will be recorded using three optical probes.
- (2) Measuring phytoplankton absorption: Variability in the specific absorption coefficient of phytoplankton ( $a_{oc}$ ) will be investigated using a UV/Vis spectrometer equipped with an integrating sphere (Kirk, 1983).
- (3) Measuring the P vs E parameters: Photosynthetic rate (P) vs Irradiance (E) curves obtained by means of a light-incubator will be investigated to evaluate the effects of environmental changes on algal photophysiology (Jassby and Platt, 1976).
- Assessing phytoplankton biomass: Determination of phytoplankton biomass (chl-a) will be assessed applying a bio-optical model based on the "solar-stimulated fluorescence" measured by the Profiling Natural Fluorometer (PNF-300) (Chamberlin *et al.*, 1990).

Seasonal variation of chl *a* measured from water samples and from PNF-300 “solar-stimulated fluorescence” method were presented. To Assess Primary Production: Daily photosynthetic rate will be estimated applying bio-optical models based on the P vs E curve parameters, the solar irradiation and the pigment profiles. The estimate values will be compared with the “in situ” Carbon-14 primary production data (Renk *et al.*, 2000).

LBM.TS-OGS will provide training field activities (cruise participation) and theoretical courses (20 hours) about optical data collection and primary production estimation using 14C method to Adriatic partners (IBM Serbia-Montenegro).

**15:50 - 16:05     Subtask 1.5.3: Po river Buoy station  
Mariangela Ravaioli – Sara Piconi, CNR.ISMAR-IGM with the contribution  
of NIB.MBS, HMI**

The river mouth was described. The position of the buoy S1 was shown, the S1 station consists of a Monitoring point for marine – riverine interactions and Bottom sediments and water column. Data are available on the ISMAR – CNR – BOLOGNA web site. S1 is a *KEY- STATION FOR THE EVALUATION OF PO RIVER INFLUENCE ON THE ADRIATIC SEA MARINE ECOSYSTEM*:

- Environmental characterization of the area: physical, chemical, biogeochemical and biological components of the water column and sea bottom
- Suspended matter , nutrient and pollutants fluxes, sediment- water interactions
- Destination of Po river sediment load, accumulation rates and mass-balances

The buoy sensors were described:

Meteorological sensors at 2.6 m.

- Wind Speed, Wind Gust and Wind Direction
- Air Pressure
- Air Temperature
- Relative Humidity
- Net Solar Radiation

CTD sensors at 1 m depth

- Conductivity and Temperature Sensor
- pH and Redox sensor
- Dissolved Oxygen sensor
- Fluorescence sensor for Chlorophyll-a
- Turbidity sensor for chlorophyll a compensation
- Mod. AANDERAA DCS 3900 - Doppler Current Sensor

Data acquired by the buoy sensors are automatically relayed to a server and delivered to the S1 web-site:<http://s1.bo.ismar.cnr.it>

An upward-looking ADCP will be mounted and CNR is ready for trying for partners:

Upward looking 600 kHz ADCP with:

- 3D Current profiling
- Multidirectional wave gauge
- Pressure sensor for water level
- Temperature sensor
- Internal back-up battery pack

ADRICOSM – EXT DELIVERABLES were described:

- WITHIN 12 MONTHS:

Set-up of the new sensors  
platform excursion for training

- WITHIN 13-24 MONTHS:

Implementation completed, start of data collection and delivery to NRT (NEAR REAL TIME COASTAL CURRENTS FORECASTING)

Present activities are focusing on:

- Responsibility for the maintenance of the buoy station
- Validation of acquired data in cooperation with ARPA DAPHNE
- Planning the definitive technical asset of the buoy in cooperation with Communication Technology- Cesena, (Italy)

**16:20 – 16:30 HEIS contribution under Tasks: 1.1, 1.3 and 1.5, Igor Palandzic, HEIS Under task 1.1.1 “SST” HEIS will work together with CNR.ISAC. Ocean Colour task HEIS will be trained to use these products. Will participate in task 1.5 related to ADCP.**

Within Subtask 1.1.1: “SST” HEIS contribution will be: During implementation of this subtask important will be experience which HEIS staff acquired within ISOTEIA project. Namely, HEIS staff has been involved in working with GIS and RS technologies and applications, and they have acquired experience in and knowledge of satellite imagery 2D and 3D processing and analysis. Also, their experience in using Esri Arc GIS and Erdas Imagine software will be helpful.

Within Subtask 1.1.2: Ocean Colour HEIS contribution will be based on: HEIS experience of working with GIS and RS technologies and applications which will be important for implementing this subtask.

Within Subtask 1.3.2: “Extending the measurement area for CTD and inclusion of optical parameters” HEIS contribution will be based on: HEIS experience, which may be important in implementing this subtask, which was collected through the MAMA project where HEIS was a partner. During this project, HEIS staff was trained on the oceanographic cruise MedGOOS-6 in the Sardinia Sea and Channel on board the R/V Urania.

Within Subtask 1.5.1: “Add new ADCP on board of two of the four major ADRICOSM CTD network vessels.” HEIS contribution: will be based on HEIS experience acquired through MAMA project, and especially participation of HEIS staff on the oceanographic cruise MedGOOS-6 in the Sardinia Sea and Channel on board the R/V Urania, will be crucial experience for this subtask

**17:00 - 17:15 Task 3.2: Organization of a delayed mode data archiving system for the Adriatic Sea Task 3.5: GIS development for coastal areas of the Adriatic Sea Alessandra Giorgetti, OGS with the contribution of ENEA.CRAM, LBM.TS, NIB.MBS, RBI.CMR, IOF**

The OGS-NODC data archiving system was presented. OGS plays a leading role in hydrological and bio-chemical marine data acquisition, management, validation and archiving, at national and international levels. Since June 2002, OGS has been notified as National Oceanographic Data Centre for Italy within the International Oceanographic Data Exchange (IODE) system of the UNESCO Intergovernmental Oceanographic Commission (IOC).

Intensive collaborative relationships were started up with Italian institutions and with European Data Centres, among others HNODC/NCMR, IFREMER, BODC, RIHMI-WDC, allowing the establishment of standard protocols for data exchange, validation and dissemination.

The reduced MEDATLAS format, used in the first Adricosm phase, includes:

- profile reference (cruise reference + profile name);

- date and time;
- geographic position (Lat. and Long.);
- bottom depth;
- list of parameters with unit of measurement.

Additional fields should be added in the final archiving, to obtain the complete MEDAR/MEDATLAS format.

Data Quality control has been presented:

QC0 – Check of the format: completeness of information;

QC1 - Check of the header: date and position, duplicates;

QC2 – Check of the parameter: automatic and with data point visualization:

- ◆ broad range check (min and max limits),
- ◆ statistical check (reference climatology),
- ◆ check for spikes,
- ◆ vertical stability check.

Flag scale values proportional to the level of error:

0 – No QC

1 – correct value

2 - value inconsistent with climatology

3 - dubious value

4 – false value

5 - modified value (for QC1 only)

The standard MEDAR/MEDATLAS QC procedure will be adjusted with:

- identification of coastal/open sea areas
- considering MEDAR/MEDATLAS II data base merged with Adricosm data and new data
- computing climatological profiles on 1°x1°box

As far as Task 3.2: “Organization of a delayed mode data archiving system for the Adriatic Sea” is concerned, LBM owns a data bank that works on a Linux server running DBMS MySQL. In the data bank meteorological, physical, bio-geo-chemical and biological data collected in the Gulf of Trieste since 1990 are stored. Biological data are coded following the guidelines of NODC and the meteomarine data classification is in agreement with the WMO code. LBM-OGS will provide the hydrological data to merge in the MEDAR/MEDATLAS data set and the meta-data about biological data to merge in other biological meta-data sets.

As far as Task 3.5: GIS development for coastal areas of the Adriatic Sea is concerned the OGS activities can be described as follows:

OGS/NODC information system

OGS/NODC data and meta-data are organized on relational database under ORACLE. Several routines allow:

- data to be inserted in the database
- queries to be performed on the archived information
- data to be extracted in MEDAR/MEDATLAS format
- quality control to be applied
- archived data to be analyzed
- data to be disseminated on-line.

The GIS interface under ArcGIS will be linked to OGS/NODC Oracle database for multidisciplinary data integration and extraction.

## **Task 1.6: Improvement of coastal hydrodynamic modelling and new implementations**

**17:15 - 17:30**    **Subtask 1.6.1: Improve the coastal forecasting activities in the Split area**  
**Zoran Pasarić, UZ.AMGI with the contribution of INGV**

**Mask and bathymetry** of the ASHELF-2 model were shown. Model simulation results were shown in terms of:

- Climatological: perpetual year
- Interannual: 01/01/2000 – 31/03/2003
- Forecast: 7 days (starting Tuesday)

**Analysis and forecasts** 1 April 2003 – 30 September 2003

Forcing: ECMWF 6-h analysis/forecast & SST (ASHELF-2)

- Wind stress: (Hellerman and Rosenstein, 1983)
- Surface heat flux:  $Q_{net} = Q_{sol} - Q_{up}$   
 $Q_{sol}$ : shortwave radiation (Reed, 1977)  
 $Q_{up}$ : sensible + longwave + evaporative
- Water flux:  $QW = P - QE/L + R$   
 $QE$ : evaporative flux;  $L$ : latent heat  
 $P$ : precipitation (climatological, Legates and Willmott, 1990)  
 $R$ : rivers (climatological)

Initial conditions

- Velocity, temperature and salinity from corresponding AREG runs

Open boundary

- One way nesting with daily averaged values of  $U$ ,  $V$ ,  $T$ ,  $S$  and  $\eta$  from AREG

Modeled vs. measured profiles comparison was shown.

Operational forecasting system is feasible for the area. Problems:

- Surface water fluxes partially taken from climatology
- Influence of low-resolution meteorological forcing on prediction of currents

Next step:

- Closer cooperation with meteorologists: meteorological forcing with a resolution better than 10 km and consideration of a possible feedback of the sea on the atmosphere
- Closer cooperation with hydrologists: real-time information on the outflow of all the rivers influencing the sea and supply of boundary conditions to hydrologic models

ALADIN/HR mesoscale model.

- Spectral, double nested, LAM
- Global model (IFS/ARPA) analysis, 4-D var
- Global model forecast
- Preparation of initial and boundary conditions for ALADIN/LACE (12.2 km)
- ALADIN/LACE forecast
- Preparation of initial and boundary conditions for ALADIN/HR (8 km)
- ALADIN/HR forecast

ECMWF vs ALADIN/HR comparison was presented.

**17:45 - 17:55**    **Subtask 1.6.2** Ing. Francesco Lalli, APAT

Coastal modelling tools were presented. Example in Pescara harbour were shown. Model equations were presented; the model features are:

- Primitive Equations
- Finite Difference (Le and Moin, 1991)
- *staggered grid*
- *time marching: 3rd order Runge-Kutta*
- *spatial derivatives: explicit 2nd order centered schemes*
- *convective terms: SMART scheme (Gaskell and Lau, 1988)*
- Complex Geometries: boundary body forces approach (Fadlun *et al.*, 2000)

Results of the model were described. Laboratory experiments were compared with model results. The model will be applied in the Neretva river mouth.

### **17:55 – 18:00 Improvement of coastal forecasting activities in marine area influenced by discharge of Neretva River, Gordana Beg-Paklar, IOF**

Motivation for the planned activities were given:

- *Strong space- and time- variability of the Neretva River plume was not entirely captured by ASHELF2 model*
- *Wind influence on the Neretva River plume*

Incorrect simulations and predictions in part of the ASHELF2 domain were influenced by the Neretva River.

A possible solution to this problem could be the implementation of a high resolution coastal model (COAST) with a 200-m horizontal resolution.

IOF contribution will be:

- To increase the horizontal resolution (model grid and atmospheric forcing)
- Choice of the vertical coordinate
- Improvement of the river discharge modelling (water flux instead of salinity flux)
- Comparison of the model results with available measurements

### **18:00 - 18:15 Subtask 1.6.3: New coastal model for the Rovinj Area Nenad Smodlaka, RBI.CMS with the contribution of INGV (Paolo Oddo)**

The Centre for Marine Research was presented in terms of facilities and activities.

Within Subtask 1.5.1: Addition of new ADCPs on board for two of the four major ADRICOSM CTD networks RBI will:

- Deploy ADCP for observation and training
- Enhance activities using local currentmeters and CTD

Within task Subtask 1.6.3: a new coastal model for the Rovinj Area will be developed:

- Based on the A-Shelf model
- Modified by local characteristics, fine resolution
- Validated with CTD data
- Nested within A-Shelf and AREG models

Within Task 3.2 Organization of a delayed mode data archiving system for the Adriatic Sea, RBI will perform the following activities:

- Evaluation of existing MEDAR / MEDATLAS data for local coastal areas
- Enlargement of MEDAR / MEDATLAS for local areas
- Expansion of data base with historical data

- Establishment of a new biological data base

RBI-CMR data bases were presented:

- Physical Oceanographic Parameters (Temp., Sal., Dens., Oxygen etc.) 1966-2005
- Biological Data (Phytoplankton, Chl.- a, Primary Production etc.) 1968-2005

RBI will participate in the Training courses and workshops.

Problem related to the work overload and small amount of money was raised.

## Second day: 23 September 2005

**09:00 - 09:15**    **Task 1.7: Atmospheric forcing studies**  
**Prof. Borivoj Rajkovic, UNIBE with the contribution of INGV**

Prof. Rajkovic presented the people working at the University:

- Bora Rajković,a (IM), bora@ff.bg.ac.yu
- Vladimir Djurdjević, (IM), vdj@ff.bg.ac.yu
- Zlatica Popov, (RHMI),
- grad. students
- Ana Vuković, (IM)
- Zorica Podračanin, (UNS)
- Mirjam Vuajdinović, (IM)

The main tasks of UNIBE will be:

- Central theme: air-sea interaction parameterizations for coastal ocean forecasting .
- Ocean forcing from high-resolution atmospheric model. How much do we gain if we have quite high resolution fluxes ?
- Verification: comparison with satellite SST, scatterometer and VOS meteo data
- Test of different GCM as sources of the boundary conditions
- Analysis of the difference in the PBL parameterizations that are currently proposed by the NCEP (Janjić) model and Mellor-Yamada-Galperin model
- If meteo data allows (strog winfields and air and sea surface temp.) viscous sub-layer parameterization will be re-examined.

Possible extentions

- From the various data collected within the poroject test model fluxes agains mesured data that can be used to calculate fluxes independently. Emphasis on the data from the coast-sea line
- Connecting domains of ocean models in the area of Southern Adriatic

Results on air-sea interaction, were presented in terms of:

Mom. flux

latent heat flux

SST

Mean SST for the Mediterranean (2002)

There may be a problem for the Computer: we need to ask if INGV machine might be available?

**09:15 - 09:30**    **Task 1.8: Continuation of ADRICOSM forecasting activities**  
**Paolo Oddo, INGV with the contribution of IOF**

The *The Adriatic REGIONal operational system (AREG)* was described. Model results were shown and model validation was presented:

- Time series of basin averaged surface temperature for 2003 from satellite VS AREG hindcast
- Time series of RMS error between satellite and AREG surface temperature for 2003
- *Annual averaged RMS between Satellite and model surface temperature for 2003*
- *Time series of RMS computed using persistence VS AREG forecast for surface temperature and salinity*

Data Assimilation of coastal CTD and open ocean XBT was described and the data assimilation performance was presented.

EOF have been computed for several Adriatic regions

EOF have been calculated from model results and for the following seasons:

Winter (January-April)

Spring (May-June)

Summer (July-October)

Autumn (November-December)

The regional model will be improved and the new configuration of the model has been described:

Same Code :	POM
Different grid hor.:	5 to 2.2 km
Different grid vert.:	21 to 41 sigma
Different river run-off:	reduced Croatian and Istrian
Different advection scheme:	Smol. to old POM scheme
Different initial condition:	Clim POM to intern. OPA
Different boundary condition:	MFS PP(MOM) to STEP(OPA)

Results from the new model were compared with the old set up and data.

Conclusions were presented:

- AREG forecasting activities have been implemented successfully and development continues (Operational from April 2003).
  - Long-term nesting of large shelf models seems to work without re-start and without model drift.
  - The model results show a strong inter-annual variability, also confirmed by observed data.
  - Data assimilation implemented for coastal CTD and open ocean XBTs
  - The AREG 2.2km 41 sigma layers has been implemented.
  - A preliminary comparison between model results has been carried out
- 
- Sensitivity experiments on vertical resolution
  - Improve the resolution of surface forcing (atmospheric and rivers run-off).
  - Support the activities for a high resolution coastal models.

**09:30 - 10:00 Discussion**

**Hydrological forecast is needed for coastal region forecast. (Three hours' resolution is the minimum)**

Discussion on Training:

3 options such as workshop, training course and training period were analyzed.

**Task 4.1: Workshops and seminars in the field of operational forecasting, ICZM, monitoring, modelling and data assimilation**

**Desa Ehrlich, Joannès Berque, UNESCO-IOC**

Concerning Operational forecasting: **coastal** modelling tools, (monitoring of real time data), data assimilation objective analysis, operational product usage, visualization for decision-makers, GODAE/MFS

Instructors principally from old and new partners in ADRICOSM community – emphasis on local experts. Attendants from new partners with priority, size limit 16-25. Host institution in location that maximizes cost/benefit.

Experts from other communities could be invited if funds available

Different format may be available:

- Workshop/summer school: 1 week?
- Or training period – more individualized visits of a month or more?
- Training courses: 3-4 days and very practical on specific task?

Discussion:

We decided who needs the training.

**Task 4.3: Training course for data management**

**Desa Ehrlich, Joannès Berque, UNESCO-IOC**

Desa Ehrlich presented the IODE program. Ocean Teacher and ODIN-MEX. ODINAFRICA III were presented.

ADRICOSM-EXT data management training course:

Data Collection & QC Protocols: extend from XBT to CDT – offer from ENEA: organize meeting

Real-time data management:

Data management networking:

Data rescue: GODAR support ? But keep focus on operational – useful for hindcast and assess changes – cost effective

Harmonize format and extraction software – netCDF, develop DODS (OpenDAP) server

Training on GIS??

Dadic underlined the importance of Data management networking,

Smoldlaka underlined the importance of data rescue

Reseghetti proposed a meeting on establishment of protocols for data collection and

Vlado Malacic said that this program has to be focused on operational oceanography

Oddo underlined that historical data are important for the development of the model.

**WP2: INTEGRATED CATCHMENT SIMULATOR SYSTEM - ICSS FOR A RIVER TEST SITE**

**10:00 - 10:15 Task 2.1: Definition of pilot area and mobilization and Task 2.2: Data Collection and Database Implementation, HI with the contribution of SGI**

Hydrometeorological institute was described. HI is responsible for the monitoring of Hydrological and meteorological data, surface waters.

HI activities in ADRICOSM-ext were presented:

Integrated catchment simulator

Pilot test site has been decided: ISHMI river: 6 hydrological stations, 6 points of water quality and 8 meteo stations.

Data collection and database implementation:

- Collection of all existing data for the pilot site
- Organize these data into a relational database and GIS

Discharge values are available.

**10:15 - 10:30**    **Task 2.3: Models set-up and implementation**  
**Ing. Alessandro Bettin, SGI with the contribution of HI**

### **WP3: DATA MANAGEMENT SYSTEM**

**11:15 - 11:30**    **Task 3.1: Organization of NRT data management system for the whole Adriatic Sea**  
**Franco Reseghetti and Giuseppe Manzella, ENEA.CRAM with the contribution of UNIBO.CIRSA, ARPA-Daphne, LBM.TS, OGS, NIB.MBS**

Malacic is proposing to include the buoy data

**11:30 - 11:45**    **Task 3.3: Development of a portal system (LAS) for satellite, in situ and model data output**  
**Roberto Sciarra, CNR.ISAC with the contribution of ENEA.CRAM, OGS, UZ.AMGI**

The GOS website and its contribution to Adricosm were presented. MODIS/Aqua Chlorophyll concentration data were presented and described and compared with MODIS/Aqua Flags data. AVHRR/NOAA17 SST data were presented. DATA Access for: SST on AREG Grid and SeaWiFS on AREG Grid data are delivered in RT plus an Offline production of Optimal Interpolated SST is performed.

#### **In ADRICOSM:**

##### SST daily products for the Adriatic Sea

SST data (AVHRR) on AREG model grid  
gif images of SST at 1 km resolution

##### Ocean Colour daily products for the Adriatic Sea

Chlorophyll data (SeaWiFS) on AREG model grid  
gif images of SeaWiFS chlorophyll at 1 km resolution  
gif images of SeaWiFS case I / case II / clouds masks

#### **In ADRICOSM-EXT:**

##### SST daily products for the Adriatic Sea

AVHRR on AREG GRID  
Operational OI SST on AREG GRID  
AVHRR png image at 1 km  
MODIS png image at 1 km  
High Resolution SST data distribution

##### Ocean Colour daily products for the Adriatic Sea

Chlorophyll data (MODIS) on AREG GRID  
Png image of MODIS Chlorophyll 1 km  
Png image of MODIS Flags 1 km  
Png image of MODIS Water Clarity K(490) 1 km  
Historical SeaWiFS web images implementation

The activities related to the preparation of the portal that will be developed for the satellite data distribution will consist of:

The upgrade of the existing web portal with the new satellite products.

Ensuring a secure access to data.

Different options of data distribution systems will be considered.

After the above mentioned activities have been carried out CNR-ISAC will try to prepare the LAS portal, which will probably be done in a next phase of ADRICOSM.

Some information on specific new products were presented:

High Resolution MODIS True Colour 250 m: From 1 to 2.8 GB disk space per day; 2 to 5.6 GB per day Aqua+Terra; 60 to 168 GB per month

Data policy:

DATA Access with password for: Historical SeaWiFS on AREG grid

Data access without password for: Modis Chlorophyll on AREG grid; Optimal Interpolated SST(AREG)

**11:45 - 12:00     Task 3.4: Data sharing protocols for meteo-marine measurements  
Ing. Simonetta Piccinini, APAT with the contribution of ENEA.CRAM, HI**

APAT has developed and maintains a system for meteo-marine data transmission and collection. In order to integrate this system with others, technical requirements for free data dissemination must be defined.

APAT will coordinate the task for fixing and sharing with the definition of data format, protocols for data exchange procedure, system architecture, software platform.

This task will be followed by the implementation of the technical requirements, according to two specific criteria:

- (1) use of open source technologies
- (2) use of Internet as data transmission and information fruition.

**Data Gathering and Management Service**

Activities in the framework of the project

- Integration of meteo-marine network already operating in the Adriatic Sea within the project;
- Definition of technical requirements for the free dissemination of the Adriatic meteo-marine data;
- Set-up of the Adriatic meteo-marine data sharing network and protocols.

Main subjects of the training courses

- Peripheral Stations: Data acquisition, Analogical/digital conversions, Spike correction and Short gap covering.

Two options may be foreseen for the data management system:

OPTION n. 1:

Network integration as Centralized DB

Free data dissemination for Centralized DB

OPTION n. 2:

Network integration as Distributed DB

Free data dissemination for Distributed DB

## WP4: TRAINING AND OUTREACH

### 14:30 - 14:45 Task 4.2: Mapping techniques for coastal data sets Marco Zavatarelli, UNIBO-CIRSA

Objective of the training course will be to disseminate technical tools and build capacity for a statistically sound analysis of oceanographical data. The Approach will be Theoretical/practical training course/stage to acquaint attending people with the theory of objective analysis and to provide the “mastering” of the related technical (computer code) tool.

The course will focus on Coastal (hydrological) data sets.

The Methodology was presented:

Estimate of oceanographic properties fields on a regular grid

Starting from irregularly distributed observations.

Based on the Gauss Markov theorem

Application to meteorological fields Gandin (1967)

Oceanographical application Bretherton *et al.* (1976), Carter and Robinson (1987)

Allows “optimal estimation” (minimized interpolation error) of the property at a given point in space on the basis of the Surrounding observations

An Adriatic Example was given: The analysis of the ATOS data set (Artegiani *et al.*, 1997)

Objective mapping of basic hydrological properties and Dynamic height (geostrophic method) was presented.

Objective mapping applicable also to non-conservative (biogeochemical) properties (ABCD data set (Zavatarelli *et al.*, 1998))

THE DAPHNE historical dataset was presented. QUALITY CONTROL PROCEDURE ESTABLISHED was described:

1. Identification through
  - Station code
  - position
  - date
  - time
2. Duplicate elimination
3. Monotone increase of depth
4. Gross Range check
  - $4^{\circ}\text{C} < T < 30^{\circ}\text{C}$      $16 \text{ psu} < S < 39 \text{ psu}$
5. Linear interpolation at each meter
6. Statistical check

All data for each standard level for each month were averaged to estimate the mean and the standard deviation, if data were more than 3std from the mean they were flagged and eliminated from further use. QC procedure was applied twice.

MONTHLY MEAN climatological PROFILES (T, S) were prepared to underline the seasonal variability. Po river runoff was calculated in terms of daily means.

Mapping of CLIMATOLOGIES consists of the following steps:

Climatological values are computed station by station at each meter -> T and S fields -> DYNAMIC HEIGHT FIELD and GEOSTROPHIC VELOCITIES. Linear interpolation through a least square technique : OA.

CLIMATOLOGY (1995-2002) of TEMPERATURE and SALINITY were computed for the Emilia-Romagna coastal data as well as for the DYNAMIC HEIGHT AND GEOSTROPHIC CURRENTS.

### 15:20 - 15:35 Task 4.4: Meteo-marine station data management

## **Ing. Simonetta Piccinini, APAT**

In the framework of task 4.4 APAT is responsible for the developing and coordination of the following themes:

- Training programs concerning the management of the meteo-marine station;
- Training programs concerning data collection, management and networking;
- Programs concerning technical visits to meteo-marine stations, informatics and telematic centers.

APAT developed a high experience in Installation and Management of meteo-marine networks, Data collection and Data Management, Modelling and Forecasting systems participating to several National and International projects such as:

- IDRO-METEO-MARE System (SIMM): for numerical forecasting of the sea state on the Mediterranean scale
- VENICE LAGOON System (SNLV): for observation, signaling and forecasting of the meteo-marine events and management of the Lagoon Hydraulic System
- ESEAS: European Sea Level Service
- RON and RNM: Real Time National Sea Wave Measuring Network (RON) and of the Real Time National Tidal Measuring Network (RMN)
- ARCHIMEDE: provides an "electronic meteo-marine data archive"

APAT will contribute to the ***Meteo-Marine station Data Management*** through a consistent exchange of experiences. Such experience will be transferred in the framework of one or more training courses

APAT's services making their contribution to the project are:

- Marigraphic Service
- Environmental Modelling Area
- Data Gathering and Management Service
- Coastal Defence Service

Each service will develop areas of activities related to the assigned task.

### ***Coastal Defence Service***

#### Activities in the framework of the project

The Coastal Defence Service will make its contribution to Adricosm Projects coordinating the activities of the other Services, the relations with the other partners of the project and the organization of courses and technical visits for Albanian partners.

Main subjects of the training courses

- Tide data elaboration system
- Tide Analysis and Forecast: Registration, Processing and Representation of sea and weather stored data
- Warning Management
- Meteo-marine modelling and statistical processes

### ***Marigraphic Service***

#### Activities in the framework of the project

- Implementation of a meteo-marine station
- Acquisition and collection of meteo-marine data in electronic data archive located in Albania
- Definition of the administrative programs for ordinary and extraordinary maintenance of the meteo-marine station

- Integration of the new station in the APAT meteo-marine network and dissemination of the data within the Project.

#### Main subjects of the training courses

- Study of the main meteo-marine parameters, meteo-marine station, buoys, instruments, etc.
- Study of the National Marigraphic Network of the Mediterranean and the Adriatic Sea:
  - Configuration and monitoring of interrelated marigraphic stations;
  - Acquisition, representation and validation of the collected data.
- Sensors and installation accessories
- Alarm management

#### **Environmental modelling area**

##### Activities in the framework of the project

- Improve the coastal forecasting activities in several coastal areas
- Add new coastal modelling sites and introduce innovative modelling activities

#### Main subjects of the training courses

- Hydrodynamic modelling
- Meteo-marine modelling and forecasting activities

#### **Data Gathering and Management Service**

##### Activities in the framework of the project

- Integration of meteo-marine network already operating in the Adriatic Sea within the project;
- Definition of technical requirements for the free dissemination of the Adriatic meteo-marine data;
- Set-up of the Adriatic meteo-marine data sharing network and protocols.

#### Main subjects of the training courses

- Peripheral Stations: Data acquisition, Analogical/digital conversions, Spike correction and Short gap covering

#### **15:45 - 16:00 Task 4.5: Training in ICSS**

**Ing Augusto Pretner and Ing Alessandro Bettin, SGI**

##### Training Course – List Of Items

- Modelling of sewer system with MOUSE
- Modelling of river basin with MIKE11
- Flow, WQ and rain survey in the integrated system
- Performance analysis – evaluation of results

##### Training Course – MOUSE

- General overview of the model
- Basic Concepts of Data Handling – Nodes, Links, basins
- Data Input, Horizontal Plan Graphics, data importing and editing
- Working in Graphical Windows
- Communication with Outer World, Time Series, background maps
- Dry weather flow calculation
- Boundary conditions, model parameters
- Computations of Runoff Model and Hydrodynamic Model
- Result Presentations and Printing (MIKE View)

##### Training Course – MIKE11

- Introduction to the MIKE 11 modular structure
  - - Hydrological and hydrodynamic modelling
  - - Hydraulic structures
- Dynamic modelling with MIKE 11 HD
- MIKE 11 Graphical User Interface (GUI)
  - Simulation editor, Network editor
  - Cross section editor,
  - Boundary and Time-series editors
- Model schematization with MIKE 11 HD
- MIKE 11 Advection Dispersion (AD) module
- MIKE VIEW – the result presentation tool for MIKE 11

Sewer Flow Monitors:

- Pressure Level meter
- Velocity Ultrasonic Meter
- Ultrasonic Level Meter
- Data Logger
- Rechargeable battery

**IOF plans and problems were presented:**

Problem of meteo station data transmission costs (satellite transmission)

Maintenance costs and repair costs in case of damage

2 cruises with ADCP + optical measurements + ctd (one on maximum NERETVA discharge)

10 cruises