



**MFSTEP WP 1 2 4 5 14 Meeting:**

**REPORT**

**(20,21,22 October 2003)**

**Meeting place:**  
**ENEA Santa Teresa**  
***Forte Santa Teresa, Pozzuolo***  
***Lerici, La Spezia Italy***

*The meeting has been held in the ENEA site in S. Teresa, located in Lerici, Località Pozzuolo.*

*The aim of the meeting was:*

- *present the progress in each observational activity*
- *finalise the observational designs*
- *coordinate the different observational activities*
- *homogenise (as much as possible) data management, data flow, quality control procedures.*

Participants (see appendix)



**20/10/2003**

**9:00-9:15**

**Welcome and local organization information have been given by Giuseppe Manzella  
Partners presentations has been done**

**9:15 –11:00 FULL GROUP SESSION**

**“MFSTEP observing system: Overview”, Nadia Pinardi**

The project coordinator Prof. Nadia Pinardi gave an overview of ADRICOSM-MFSTEP observing system going through the most important learnings from MFSP operational data assimilation system. The structure is composed of two systems: large scale and a shelf scale with same RT dissemination of data and added value products. The requirements for the observational systems are for a high resolution data both in space and time. Additional requirements that can be defined on the base of the combined data analysis - modelling studies are:

- 1 Full resolution XBT transmitted in real time (RT)
- 2 Full resolution CTD also transmitted in RT
- 3 Three days surfacing of ARGO floats and (if possible) full resolution profiles

The data flow has to assure the access to both raw and QC data. For this reason two streams of data have to be implemented: 1) raw real time data 2) QC data in NRT (few days delay). Actually this approach is adopted in the MFS-VOS observation system, the implementation being part of the ADRICOSM project. Ideally the “two stream of data” should have the following characteristics:

- 1) First stream of raw data within 12 hours,
- 2) Second stream with improved QC within 2 days

In the existing MFS-VOS NRT QC still has to be implemented a sea floor automatic detection check.

In MFSTEP it was foreseen to store data both at TEDC (Thematic Expert Data Centers) and ADCC (Archiving and Dissemination Data Center)

RT data collecting at TEDC for MFSTEP:

- ENEA for XBT, multiparametric probes, SAVE
- NCMR for M3A
- OGS for MEDARGO

Connection with GODAE and GTS system has to be achieved for all systems.

MFSP operational system/MFSTEP-ADRICOSM observing system was described. The decimation problem encountered in MFSP VOS may be present also for ARGO data. Coarse resolution in the Mediterranean will not allow to detect the Levantine Intermediate Water.



The MFS-SYS2 operational system (now operational) was described. The QC control and pre-processing of RT data: real time data set collected every week. QC and Pre-processing for XBT and SLA was showed.

### **“WP1 Strategy”, Giuseppe Manzella**

The Ship of Opportunity Program in MFS was presented, with the new strategies developed after MFSPP regarding the data transmission and NRT QC.

In MFSTEP the Sippican probes will be acquired only by ENEA and distributed to the partners. During 2003 ENEA has acquired some probes using fundings external to MFSTEP. On the base of the information sent by the partners, two types of Sippican probes have been selected: T4 and Deep Blue. Actually ENEA has the availability of 288 T4 and 416 DB. Additional 984 Deep Blue probes have been ordered. Sippican offered these probes at a unit price of USD 68.27, instead of USD 74.20 The meeting has also the objective to define the operational way to deliver the XBTs to the partners, without losing the discount benefit. It has been calculated that about 400 XBT every month will be launched in the TOP phase

Technological elements in MFSTEP will be presented in working groups:

- Multiple launcher
- MFS VOS multiparametric probes (temperature, conductivity, fluorimetry)
- SAVE

The new MFS-VOS NRT QC procedures have been presented many times. Actually the data flow system is arranged in the following way:

- data are collected and stored in the computer
- in coastal areas where the GSM signal is present, the operator prepares a zip file that is transmitted by using internet to the e-mail [vosdata@santateresa.enea.it](mailto:vosdata@santateresa.enea.it)
- the edf files are included in the ftp site
- the data are passed through the MFS-VOS NRT QC softwares; the new files in Medatlas format are stored in the ftp site
- the new downloading system is updated.

All this procedure can be done also remotely. Only an ftp transfer software is necessary.

The data collection system is formed by: Computer, Sippican card (MK12 or MK21) Sippican hand launcher, GPS, phone card.

It was decided that data will be made available soon after the collection and transmission.

VOS download web site system was presented.

### **MFSTEP Tracks presentation:**

#### **“Barcelona-Algeria“ Antonio Cruzado**

Barcelona Skikda track



Aanbela and Isabela from Chemicalien Seetransport GMBH are the two ships that will be used Methan Polar from Osprey Maritime Ltd is the other ship that can be involved in data collection He pointed out that full resolution data are much better than decimated ones. The other problem related to the MFSP used ARGOS software was also related to the calculation of the position, that was not right.

### **“Sete-Tunis” Claude Millot (Presented by Manzella)**

The responsible of the track was unable to be in the meeting since was in Egypt for a possible collaboration, having the aim (among others) to collect data in coastal areas.

### **“Genova-Palermo” Carlo Galli presented by Mario Astraldi**

He showed the ship used, the launcher system modified because the ship was very high. 12 meters tube. 38- 40 probes were launched every time during MFSP. He showed also a statistic of the profiles collected in each trip and the decimated files transmitted by means of the ARGOS system.

### **“Ploce-Malta” Miro Gacic presented by Vanessa Cardin**

I the longest VOS time series in the Mediterranean, lasting 5 years (September 1999 to now). The data were collected in the framework of MFSP, MFSP extension, ADRICOSM. She presented some results that were discussed with the partners.

### **“Bari-Dubrovnik” Giuseppe Manzella**

This track is part of the ADRICOSM project. Measurements started in October 2002 and are still underway.

### **“Pireus-Thessaloniki” Christos Tziavos**

Minoan lines will be used. Route length is 360 miles, 25 profiles will be acquired. The track has been showed in detail. 200 meters should be the minimum depth to launch the probes Transmission may be done twice a track Ships Identification number is important to be transmitted.

### **“Cyprus-Alexandria” George Zodiatis**

Louis Cruise Lines will be used, as during MFSP, but the end port is no longer P. Said, but Alexandria.

### **“Haifa-Messina “ Isaac Gertman**

1020 nautical miles. Upper thermocline General circulation obtained melting the POEM data and model dynamics was showed with the tracks on it. The end port should be Salerno, This could allow an easy delivery of the XBTs.

### **“Alessandria–Istanbul” Emin Ozsoy**

Ship Companies have been contacted; track has to be decided on the basis of ship opportunities and scientific issues. In particular two companies could contribute: Arkas and Turkon. They have no fixed lines.



**11:30 –12:45 FULL GROUP SESSION**

**“WP2 Strategy“, Kostas Nittis**

**“The Mediterranean Multisensor Moored Array system in the Aegean Sea” Kostas Nittis**

The M3A system will be used for:

- Evaluation of basin scale and regional models / assimilation
- Calibration-validation of ecological models
- Study regional dynamics
- Contribution to GOOS open seas system

It consists in Open Sea Systems (mooring > 1000m) collecting different parameters:

- Physical parameters 0-500m
- Bio-chemical parameters 0-100m
- Air-sea interaction parameters at surface
- Real time data transmission of raw data and NRT availability of QC data

Mooring sites were presented

Existing experience (TAO array, BTM, YOYO) were compared with the MFSTEP design.

The presentation by Kostas Nittis involved:

- Design of the M3A Systems (in the Aegean, Adriatic, Ligurian)
- Construction of System components
- Deployment of the buoys

Biofouling problems

Main goals for MFSTEP

Underwater modem communication with acoustic link at 5000 bits/sec

Communication system: ORBCOMM LLC, IRIDIUM

Antifouling experiments were done in Saronicos Gulf with the following procedures:

- No antifouling
- Antifouling canister with bromine tablets in parallel with flushing channel
- Copper tubes of 10 cm length in line of flushing channel
- Bromine+copper tubes

The Chlorophyll-a sensor was calibrated before and after the anti-fouling experiment in order to assess the results.

Improvement in NCMR system: underwater communication, new umbilical design, satellite communication, buoy electronics; new buoy instrumentations (pyranometer, compass, cabling system)

WP management

Harmonization of the Quality Assurance procedures

M3A web page and M3A-TEDC were discussed.



**“The Mediterranean Multisensor Moored Array system in the Ligurian Sea” Roberto Bozzano**

W1-M3A features

Functional scheme of the buoy was described as well as the technical design and buoy positions. Platform behavior was described (average speed of 0.03 m/s for the 62% of the time), maximum drifting speed 0.16 m/s

The actual data communication system is based on ETACS system having a relatively high reliability (60% of the data are transmitted within 24 hours). The buoy data have been intercompared with CTD casts

Buoy maintenance was described.

Future work:

Equipments update

Software updates

Buoy maintenance

Intercomparison

Integration of automatic QC

ADCP looking downwards to 300 meters 5 meters of resolution.

**“The Mediterranean Multisensor Moored Array system in the Adriatic Sea” Miro Gacic presented by Vanessa Cardin**

Technical specification was presented. The buoy is large (6 metres diameter) and will contain an autoanalyser for nutrients, conductivity and chlorophyll analysis. A pumping system will bring the water from four different depths to the autoanalyser on the buoy. This system has been designed in the framework of an Italian funded program. The design will be updated in April 2004 in order to fulfill the M3A requirements. The communication system will be based on ETACS

QC procedure was described.

The buoy will be deployed on November 2003

**14:00-18:00 PLENARY SESSION**

**“WP4 Strategy” Pierre-Marie Poulain**

Floater deployment experience was presented. CTD measurements for intercomparison were used.

Statistical simulations, based on in-situ observations of currents versus depth, were presented.

Numerical model was used for choosing the deployment sites

APEX floaters were described.

Data will come as soon as they are transmitted by the floaters.

MEDARGO data center at OGS was described.

Fix the offset problem and increase the resolution in the upper part.

**“PROVOR float developments” Sylvie Le Bras**

The deployment of the Provior floaters was shown and the DMOS System was described. The data transmission is based on the tow way telemetry by ARGOS.



Other telemetry system will be checked:

Midori II (Adeos II) launch in December 02

IRIDIUM:

Promising link test

Iridium-GPS antennae ordered

Field tests programming

**“MFSTEP floats deployment” Jordi Font**

Experiments was described:

2 APEX 1 nm apart (N-S) on 26 Sept. from a small boat

2 PROVOR 1 nm apart (W-E) on 2 Oct. from R/V García del Cid

**“WP5 Strategy”, Pierre Testor**

Glider technology description was done. On the base of the existing capacity, the Ionian section should be covered in 15 days (40 up&down profiles; 12-14 repetition autonomous; 8 km long track)

Present and planned sensor packages

Altimeter

Conductivity, temp, depth

Sampling design:

Around 40 selected levels (instead of 1m resolution)

Vertical velocity control

Upgrade battery

Glider experiments:

TOP 2004 Sept: launching

TOP +20 days: recovery upgrade to lithium batteries

TOP+ 50 days: recovery

**“Multi-observational survey for glider deployment” Giuseppe Zappalà**

An official request to CNR has been done, for the use of the Urania ship. The survey will allow check of new instrumentations, comparison among different systems, check of the multiple launcher, other trials.

3 cruises with 50 days of interval will be performed, if the proposal will be accepted by CNR.

The track: we will follow the glider

The involved institutions are: CNR\_IST, ENEA, DECOS-UNITUS, KIEL University.

Multiple launcher operation operate by CNR-IST

MFS-VOS multiparametric probe experiment performed by DECOS-UNITUS

Ancillary measurements will be performed by CNR and ENEA

Luigi Sanzo Boat has been presented and looks as a good alternative to Urania in case of “coastal” and short period cruises.



May be the first cruise will be done with Sanzo boat in spring and then when the glider will be recovered lithium battery will be put on the gliders.  
Discussion about altimeter was done.

**“WP14 Data Management”, Loic Petit de la Villeon**

Data management for NRT flow of information and long term archiving of observing dataset.

ADDC and TEDC will archive the data.

XBT data:

Real time data at ENEA are two kinds: raw data and QC data, twice a day IFREMER automatically connect to the ENEA site, new data are downloaded and then are inserted to GTS (make available also to MERCATOR (weekly) and to SOPRANE (daily))

From GTS could arrive data from other projects to MFS.

M3A:

Meteo data should go to GTS?

Subtask 14720: NRT data dissemination through the GTS

Each site has to have an ftp site and then NCMR collect the data from the three ftp site

Display of the data in real time on the web site?

ARGO:

Argos data sent to OGS and IFREMER

Delay mode data flow

Gliders:

X y z time and parameter

[www.ifremer.fr/mfstep](http://www.ifremer.fr/mfstep) web site was presented.

**“New satellite data transmission possibility”, NEXT Marco Bonfanti and Andrea Pistoni**

Company presentation

gallileo system

communication system

satellite phone (globastar ) satellite communication management software

concentrate all the activities on the laptop: develop XBT/RS232 converter

GPS/EGNOS receivers

Receive store and manage XBT data

**21/10/2003**

**9:00-11:00 WPs GROUPS SESSION**

**11:00-12:45 FULL GROUP SESSION**



**Nadia Pinaridi:**

Temperature anomaly during Summer 2003 from SST data was presented and discussed with the partners.

**“The new VOS data management system”** Giuseppe Manzella

MFSTEP web page data access was shown.

**“Presentation of MFS-VOS multiparametric probe and SAVE”**, Marco Marcelli

**SAVE:**

The design of the general architecture of the SAVE was presented.

Instrument payload and data transmission system

Yo-Yo system allow to have only one kind of drug

2 depressor will be developed:

offshore high velocity and near cost low velocity

Modularity

He gave details on the underwater unit (data transmission system)

OEM C-T sensors have been purchased

Software and firmware details were given

**MFS-VOS multiparametric probe:**

technical specifications for experimentation are finished

The optical filter for fluorimeter measurements have been chosen

Temperature and fluorescence sensors technical specification have been defined

He said that they are design the data transmission system

General structure of the fluorometer was described

Electrical module was described: digital transfer data in wireline

Measuring channel was described

Electronic circuits configurations

Now it will start the Technical/economical investigation

**“Multiple Launcher development”**, Giuseppe Zappalà

Obtain a low weight device, reliable, easy to transport launcher

Data acquisition and transmission system was presented and the general structure of the launcher was described:

GSM/GPRS modems, Satellite Modem

GPS receiver

Control electronics and data acquisition system

Operator console

Laptop/PC

Power actuators

Analog and digital inputs from probes and ship sensors

Launch options: south of/north of/.../now

Data strategy: acquired data will be stored locally, data transmission will occur automatically

**“The MFS-VOS and shipping company: give visibility to collaboration”**, Luisella Bianco

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A first version of the movie that will be delivered to the ship companies was presented and discussed with the partners. The movie will be probably upgraded with music. Other movies to be added will be collected by each partner involved in VOS system and sent to Luisella Bianco.

**“PROGECTA actual functionalities”** Giovanni Coppini and Luisella Bianco  
PROGECTA status was presented to the partners, future upgrades (notification system) was discussed. Christos Tziavos suggested that when a deliverable status is declared concluded by a subtask responsible mails are sent to the WP leaders and Project Director in order to be able to check if the specific deliverable have been released properly. Another suggestion is to add comments when deliverables are released in order to allow other partners to find the deliverables. Deliverables (reports) will be available on the WPs web site in a restricted area.

**14:00-18:00 WPs GROUPS SESSION**

22/10/2003

9:00-12:45 FULL GROUP SESSION

**“WP1: the final design of the VOS system”**, Giuseppe Manzella

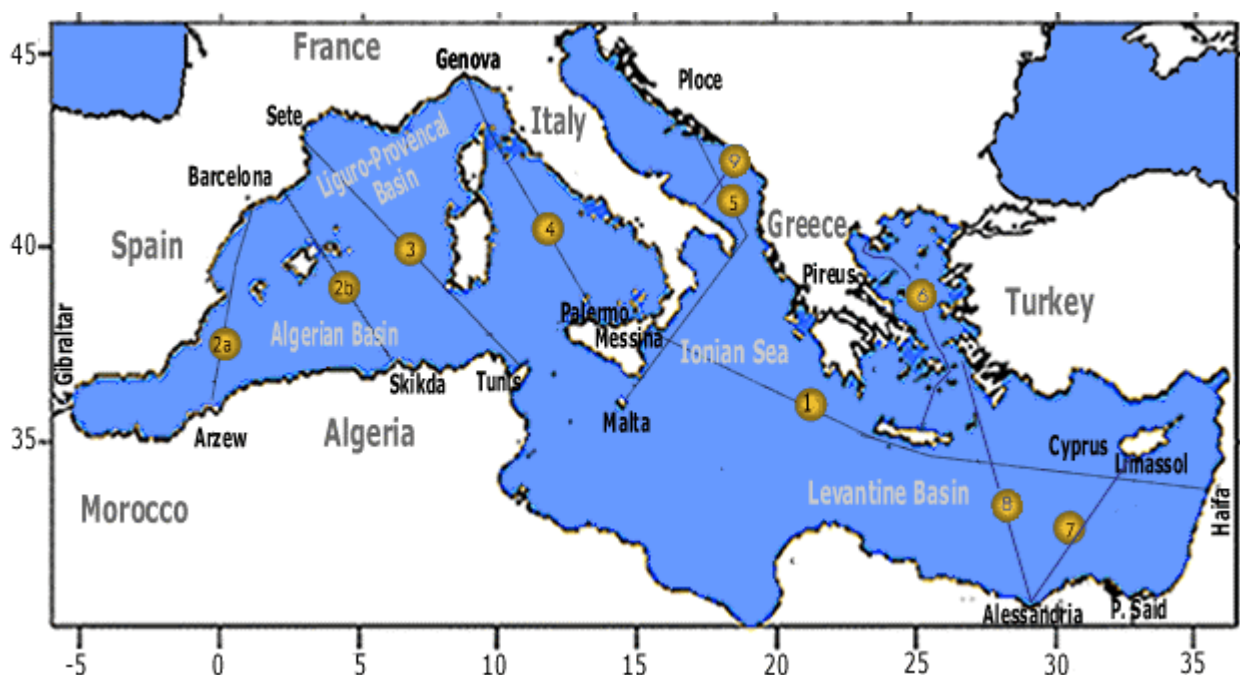
The main conclusion of the working groups of WP1 are:

**1) Hardware for data collection**

Maintain the old Sippican system composed by MK12 (or MK21) and hand launcher LM3  
GPS to be connected to the Sippican card to record the launch position  
GSM transmission

The coordinator was required to contact Sippican and ask if the old system can be used with Pentium >2 and Windows > 98

**2) MFSTEP VOS track design (for the period September 2004 - February 2005 (total 6 trips))**



Track 1 (IOLR) Haifa - Messina - Shipping Company ZIM, length 1260 nm, requires 756 probes. These can be embarked in Salerno. ENEA will provide an Italian SIM card

Track 2 (CEAB) Barcelona - Skikda (or Arzew). Shipping companies Chemicalien Seetransport GMBH or Osprey Maritime Ltd, about 350 nm, 210 probes are required.

Track 3 (LOB COM) Sete - Tunis - Shipping Company Delom, about 500 nm, 270 probes required



Track 4 (ISMAR Sez. SP) Genova - Palermo, Shipping Company Grimaldi, about 400 nm, 240 probes required

Track 5 (OGS) Ploce - Malta, supported by Adricosm

Track 6 (HCMR) Irakleion - Thessaloniki, Shipping Company Daedalos, about 190 nm, 120 probes required

Track 7 (DFMR) Limassol - Alexandria, LouisCruise Line, 260 nm, about 156 probes are required

Track 8 (METU) Izmir - Alexandria or Izmir - Haifa. This track has not yet a final definition. Shipping companies could be Arkas and/or Turkon. About 300 probes could be required

Track 9 (IOF - ENEA) Dubrovnik - Bari, supported by ADRICOSM

In total 2052 probes are required, composed by 240 T4 and 1812 Deep Blue. To these, 10% additional probes have to be added (in case of wrong launches) for a total of 2004 DP (corresponding to 167 boxes) and 264 T5 (corresponding to 22 boxes). Actually 416 DP are in ENEA, 288 T4 are in ENEA and 984 DP have been ordered. Other 604 DB are required.

**No probes will be launched in territorial water**

**Second WP1 meeting in May or June**

### 3) MFS-VOS multiparametric probe

Although some important developments have been seen in the design, there is still a need to better define the sensors characteristics. The general target is:

- Detect the deep chlorophyll maximum (80 - 200 metres depth)
- Detect the minimum temperature at depth (150 - 300 m)
- Detect the LIW core (350 - 450 m)

This target is very ambitious and requires a more precise calculation of the dimension fluorimeter sensor (and calculation of water flow), the more accurate location of temperature and conductivity sensors, a new calculation of the probe falling speed.

**“WP2: state of art of the 3 sub-systems, common QC procedures, access to data”, Kostas Nittis**

**From the WP2 separate session:**

Data transmission to TEDC (NCOM):

Quality controlled data go daily from the 3 centres to M3A TEDC

The data that will be sent are concerning the last 24 hours measurements

ADDC will collect from NCOM



Transmission from the buoy to each center each 3 hours, 3 hourly data  
METEO data standard has to be used?  
Wind velocity measurements are measured at different height  
Do we have to standardize the data before transferring to the GTS

The 3 centres will think about graphical representation on the M3As web page

#### **ANTIFOULING/CALIBRATION**

Antifouling experiment was presented.

Pending issues:

The experiment will be repeated during the next spring bloom

Introduce longer copper tubing

Control bromine diffusion rate

Add copper plates beneath PAR sensors

Calibration of the sensors to each zone range

The experiment of antifouling will be enlarged to the other two buoys systems

#### **DATA TRANSMISSION**

iridium and orbcom systems were presented

Data flow:

E1M3A1:

Sample 3 hours

Transmit 3 hours

E2M3A2:

Sample 3 hours ocean

1 hours

transmit: 24 hours

E2M3W1:

Sampling 1 hours

Transmit 8 hours

Data to ftp at TEDC daily and then to ADDC

Data Flow Quality control

Web pages to be developed and linked to WP2 web page

Reports (deliverables and managements) + data available through WP2 web. PWD protected

Visualization. To be decided by partners

Questions:

Meteo data: at what level? Do we have to convert?



Hourly meteo data have to be transmitted?  
ADCP data. Format? QC?

Antifouling methods experiment  
Calibration of the sensors experiments  
QA procedures: antifouling  
Light sensors well response to antifouling methods

Conclusion:  
Repeat the experiments, introduce longer copper tubing, control bromine dissolution rate, add copper plates beneath PAR sensors,  
All partners follow calibration procedures for chl-a before deployment  
Rabbit the tubing system because they are transparent in the seabird

Telecommunication system was presented

Protocols for calibration procedures will be available through the web

**“WP4: final design of the MedArgo system, links with other observing systems”, Pierre-Marie Poulain**

Do list:  
Write a CIESM abstract about floats test  
Recoveries of the 4 floats (with CTD)  
Improvements of MEDARGO/TEDC products  
Finish design simulation  
Assessment of results and fix problems  
Buoy 16 floats, hopefully including the IRIDIUM and one Argos-two way prototypes  
Define their cycling and sampling characteristics (5 day cycles, higher vertical resolution in the upper water layer)  
Coordinate deployments along VOS-XBT lines with WP1 and a few deployments during glider exercise (WP5)

Deployment of the 16 floats will be August-September: lines of deployment (Haifa messina container ship (OGS team), two tracks from Spain (Barcelona to Skikda) Jordi will ask to people from Malaga for a deployment in the Alboran Sea

In the middle of the TOP phase the other four floats will be deployed

Winter 2003/2004: assess the floats and design simulation.  
Spring 2004: procurements of the floats  
MFSTEP annual meeting (March 2004)  
WP4 meeting in June 2004 (CIESM?) (Final details before Top deployments)

**12:45-14:00.....LUNCH BREAK**



**14:00-15:30 FULL GROUP SESSION**

**“WP5: initial design of the glider”, Pierre Testor**

2 weeks of test in June using R/V Sanzo

data collection:

goal: 10 minutes at the surface for data transmission 40 levels of T and S

radio waves transmission 30 km transmission

three kind of files: log file, data file, short data file.

Mission:

700 meters deep:

40 levels during the dive down (NRT)

1 m resolution in the data file

the glider will not go to the surface were boat are expected

MFSTEP forecast will be used to have a strait line of sampling

**Data Management**

VOS SYSTEM

Metadata also at TEDC

XBT full resolution to the GTS

Maximum depth of deep blue is 900m

There will not be any more decimated profiles

The data are already at the ftp

Multiparametric data may not go to the GTS

Down load will not be monthly but continuously

**M3A SYSTEM**

M3A ftp at TEDC and 3 centres, www at TEDC and at the 3 centres and ADDC

Timing for delay mode is two months but it should be maintenance cruises timing

**MEDARGO SYSTEM**

ARGO data in delay mode are different from real time because they may be corrected at the end of the project. If IRIDIUM transmission is apply the data will may be transferred to OGS and then to ADDC, possible problem to maintain the operational standard

**GLIDER**

Glider data (only TS in real time) will be delivered to TEDC and then to ADDC

**Data dissemination policy**

RT data collected in MFSTEP should be:

–Free for the world from ftp/web sites:

- For XBT data
- For ARGO data

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- For M3A data
- Maintenance cruise data

–Free only to project partners (since validation is still to be carried out):

- Multiparametric
- SAVE
- GLIDERS

Scientific publication of the data from somebody different from the data originator, should be done with the participation of or at least in agreement with, the data originators

Fill the questionnaire were they ask for the password

**15:30-16:00.....CLOSING REMARKS**

*Sono passati diciotto anni da quando cominciai a disegnare La ballata del mare salato, ma ne sono passati molti di più da quando iniziai a leggere Henry de Vere Stackpoole, scrittore poco conosciuto recuperato dalla «romantica» Sonzogno, una collana di letteratura popolare italiana. Figlio di un prete, nacque a Dublino, studiò medicina e fu anche giudice di pace per casi minori. Fece tutto malvolentieri, ma riuscì a scrivere una buona novella nel 1909: La laguna azzurra. È la storia di due ragazzi che non sapevano di dover morire e di un vecchio marinaio ubriacone che lo sapeva benissimo. Fu questo scrittore, e non Robert Louis Stevenson, non Conrad e neppure Melville, che per primo mi fece amare i mari del Sud. È a lui che dedico questa ballata, dove appare per la prima volta Corto Maltese il marinaio.*

A stylized signature of Hugo Pratt in black ink.

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A stylized signature of Hugo Pratt in black ink, located in the bottom right corner of the watercolor illustration.

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