Project contract no. 036851
ESONET European Seas Observatory Network

Instrument: Network of Excellence (NoE)
Thematic Priority: 1.1.6.3 – Climate Change and Ecosystems
Sub Priority: III – Global Change and Ecosystems

Periodic Activity Report

Period covered: From 1st March 2008 to 28th February 2009
Date of preparation: April 2009

Start date of project: March 2007 **Duration:** 48 months

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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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REFERENCES
Annex 1 to the contract: Description of Work (DOW) version of February 2009.

EVOLUTION
Version 1.0: 15th of April 2009, sent to the European Commission for yearly reporting.
Version 1.1: 30 June 2009.

PUBLISHABLE EXECUTIVE SUMMARY

During the first year, the main ESONET working groups were constituted at WP level and the core groups of each ESONET node were initiated with varying progress. The related activities were starting in WPs and in some regions but not all.
Consequently the main general objectives of this 2nd reported period were:

- to increase the level of integration on regional nodes by encouraging the involvement of the partners associated with nodes to participate in ESONET activities, for instance by encouraging the submission of proposals for the 2nd call for demo missions.
- to encourage the level of integration across ESONET nodes, for instance by preparing a more formal call for exchange of personnel. WP leaders also made efforts to increase participation in their WP activities.
- to stabilise the constituted groups by starting the preparation of a permanent structure (VISO) and involving core services, stakeholders and private companies…
- to develop long-term strategy on standards implementation.
- to update recent advances in marine research, to garner individual inputs from subject experts with ESONET NoE and elsewhere, as well as to investigate science priorities of various organizations from regional to international levels.

ESONET activities were amplified during these second year. Preliminary results from different working groups were presented during the second General Assembly in FARO (Oct 2008).

❖ Main achievement regarding integration on ESONET regions (nodes):

Jointly WP1 and WP5 created a questionnaire to gather information on existing site survey data, on infrastructure requirements, and on the names of persons in charge of various aspects of planning observatory experiments at each observatory node. Then the compilation of answers and already existing scattered information were used to nominate people into each **regional implementation committee**, in addition to the two node coordinators, which were nominated at an earlier stage. This summarises the second step towards core group constitution for the ESONET nodes. This stage was successful if we consider that 9 nodes react and that other nodes will be further encouraged to react before the Second All Regions workshop (Oct 2009).

This reporting period has seen particular progress regarding the Arctic and Ligurian nodes, and the Call for Demonstration Missions (WP4) has provided an efficient tool for this progress. For the Arctic node, two separate teams had submitted independent Demo-Missions proposals (ARCOONE and MASOX). The ESONET Steering Committee recommended that these two proposals be merged and the resulting project resubmitted to the second call for demonstration Mission (see WP4 report). Following submission and selection of this unified Demo-Mission project, an Arctic workshop was been organised by NIOZ in Texel (Netherlands) the 18-19 Feb. 2009. This workshop involved more than 50 participants and was supported by ESONET. More information can be found on **www.nioz.nl/arctic**

Six demonstrations missions were selected through 2 internal calls (WP4, 2007-2009):

- LOOME is monitoring the Hakon Mosby mud volcano;
- LIDO demonstrates the interest of acoustic monitoring for geophysical and biological issues on Iberian and East Sicily sites;
- MOMAR-DM will implement an autonomous acoustically linked observatory with 2 nodes on active hydrothermal site;
- MARMARA-DM will prepare the implementation of an multidisciplinary observatory in the MARMARA Sea;

- MODOO in conjunction with EuroSITES, will implemented a pseudo real time monitoring of the water column and of the seabed at the PAP site;
- MASOX and ARCOONE were merged and will enhance current monitoring and prepare for the implementation of an Arctic multidisciplinary observatory, which includes the Hausgarten site.

The selection of those 6 demonstrations mission is directly enhancing the integration at seven ESONET nodes.

For the Ligurian site, the calls for Demo-Mission projects also played a positive role for building the community. The project proposed for this node (MOTTO, 2nd Call of WP4) was not selected for ESONET funding, but the community involved at this node is now clear.

Consequently, the regional implementation groups are now defined for each ESONET site and will contribute to the constitution of the Regional Legal Entities planned in EMSO-PP.

❖ **Main achievement regarding integration across ESONET regions**:

A formal call for exchange of personnel between the ESONET members involved in various nodes was launched in September 2008 for a deadline in November 2008. Sixteen proposals were collected. These proposals involve 17 partners altogether, for visits of 2 days to 10 months. Seven projects have a strong methodology and/or technical component. The other projects are focused on observatory science.

The selected demonstration missions also participate to across nodes integration: for instance LIDO is acting on Iberian, Sicilian nodes but also on Ligurian one.

Most of the partners involved in one node for a demonstration mission are also involved in another. In this way, as well as through the relevant WP leaders, communication and standardization issues will be reinforced.

❖ **Stabilisation of the constituted groups: preparation of a permanent structure (VISO)**

The necessity to establish a permanent structure to sustain ESONET NoE is now well understood by the ESONET community and the preparation of a Virtual Institute (VISO) is on the way. Indeed a workshop is organised in June 2009 in Tromsø (Norway). The VISO Steering Committee is formed, the meeting facilities are booked, and the draft agenda is approved. An invitation to the hydrocarbon industry is pending for participation. Norwegian regional observatory initiatives were linked and a national strategy for observatory sites was implemented including a website.

❖ **Development of long-term strategy on standards implementation**

A preliminary structure of the ESONET data management plan is available. The data management group consisting of representatives from ESONET demonstration sites, Ifremer, WDC-MARE, EuroSITES and SeaDataNet continues to refine it. The ESONET data and information portal is opened and will be extended by information inventories from further tasks. The ESONET Spatial Data Infrastructure (SDI), based on OGC standards has an initial design in place and continues to be developed. (WP1b)

The contribution to sensor interoperability (WP2) and to the sensor registry is focussing on electrical interface issues as described in standards like IEEE 1451, CanOpen or other field bus systems. Typically weekly telephone conferences with partners from ESONET and interested institutions in Europe (IFREMER, University of Barcelona, Kiel University, University of

Aberdeen, Bremen University) and from international institutions (MBARI, NIST, OGC, NEPTUNE Canada) are held to discuss and promote developed concepts.

- Specification reports for demonstration actions have been issued concerning sensor interoperability, quality assurance, underwater intervention procedures (WP2).

- Two reports on sharing testing facilities were prepared.

- Some partners of ESONET are participating to GEOSS activities. Use of deep-sea observatories for specific thematic areas will be add to the GEO roadmap.

Many reports were produced (sounds a little vague) and their recommendations will be applied to the six demonstration missions, which are running.

- **Update of recent advances in marine research**

In the framework of the WP3 scientific objectives were updated taking in account all major science areas and recent scientific issues in marine science associated to time-series and observatory research. This was performed, in part, in the framework of the scientific objectives workshop held in Faro in October 2008 attended by a prominent group of expert scientists from different EU projects, reporting to the Scientific Council and to the Strategic Committee.

To ascribe the development of generic technology to the scientific requirements ESONET is working to design the science modules: a generic one for commonly used instruments in marine science, like a CTD, and the specific ones that are specific to a research field to be added as needed to meet the science objectives. This year a provisional generic science module was specified so that the specifications could be available to other work packages for data management (WP1), interoperability (WP2) and implementation strategy (WP5) concerns. The availability of rather specialised sensors, sensor systems, and platforms have been investigated and documented, but because there are now many systems being used in deep-sea international research, regular updates will be done.

- **Implementation strategies**

Implementation strategies are now well advanced (WP5). Implementation is considered for 2 kinds of observatories/sites, corresponding to the two WP5 working groups – Generic Cable site and Standalone site. An initial report to EMSO on implementation strategies has been submitted and the first meeting of ESONET NoE and EMSO took place. Other reports are available contributing to the various aspects of the implementation strategies: cooperation between research organizations, cooperation between organizations involved in developing technologies, and links with commercial companies.

A Legal, Ethical & Environmental (LEE) database has been set up to assemble the relevant legal and best practice documents (International, EU, national, local). It also provides a homogeneous atlas describing the ESONET sites and all parameters needed for environmental assessment and permits (WP1 & WP5).

A meeting with the oil industry was held in Brussels on November 26th 2008. The agenda of the meeting was to identify common areas of interests (geographical, scientific or technical domains). Twenty-six participants attended the meeting, including representatives of the EC, ESONET NoE and EMSO PP, Shell, BP, Total, DELOS, including the Coordination Team.

The link between ESONET and MyOcean Marine core services of GMES was enhanced as P. Bahurel was invited to join the ESONET General assembly meeting held in Faro. An outline of activities and links with GMES are incorporated in the Core Services Report. The coordination team wrote a support document that will be presented to the core services: MyOcean project for the Marine core service and PREVIEW project for the Emergency Response Core Service.

WP3 has also begun a dialog with members of the Marine Core Service team focused on working towards identifying the ESONET and EMSO potential contributions to the GMES organization.

- **Communication and outreach**

Three issues of ESONEWS letter were prepared and broadly distributed. Most of the partners are regularly participating in high level conferences and outreach events. A great list of bibliographic references is claimed under ESONET (see annex of the report).

The ESONET-NoE public outreach network consists of 3 aquaria (Lisbon, Brest, Heraklion) that will inform and educate the public with regard to ESONET-NoE goals and scientific and technological achievements. Web cameras are already installed.

A web-portal for school age users is online. Several outreach and training activities are offered: http://mars-srv.oceanlab.iu-bremen.de/eduandoutreach.html.

Outreach pages are translated into 14 EU languages. The system is online and embedded into the ESONET Education pages. http://mars-srv.oceanlab.iu-bremen.de/. The main ESONET web site has been improved: www.esonet-emso.org

- **Main problems met and solutions undertaken**

The importance and diversity of activities carried out within the WP1 led to the split between a new WP1 devoted to regional integration and exchange of personnel and WP9 dedicated to data management.

Conclusion

This report reviews the activities of the Network of Excellence ESONET after two years of existence. More than 381 people (215 researchers, 134 engineers and technicians, 32 students) participated in this second year activities of the network. This number will further grow in the coming months with the selection of two new demonstration missions (MODOO and MASOX-ARCOONE) and the possibility for associate members to participate in the networked activities.

The first year was mainly devoted to the launching of the network and the resolutions of the many administrative and operational issues raised by partners about the operation of a network of excellence. Most of them, despite having participated in projects Europeans were unaware of the specific contract needs of a network of Excellence. This induced some delays in the launching of a limited number of activities while most of the activities were conducted as planned.

Delays, which occurred in the first year have been eliminated and all the deadlines in the contract are met. Indeed, the start of demonstration missions during the first years has greatly boosted the network. All DMs contribute to the activities of all WPs. Exchanges of personnel proposed are mainly related to a demonstration mission.

At a wider level than the ESONET Community, the observatories initiatives are assembling through a word wide International Association of Sub-Sea Observatory Operators (IASSOO) and an agreement is circulating between NEPTUNE Canada, OOI, and DONET for signature.

1 PROJECT OBJECTIVES AND MAJOR ACHIEVEMENTS DURING THE REPORTING PERIOD

1.1 Overview of general project objectives

The long-term monitoring of environmental processes related to ecosystem life and evolution, global changes and geohazards, is now recognized as necessary by the scientific community. To better understand geophysical, biogeochemical, oceanographic and biological active phenomena scientists need long time series of data to identify temporal evolution, cyclic changes and to capture episodic events relating to oceanic circulation, deep-sea processes and ecosystems evolution. In addition, long-term monitoring will detect episodic events such as earthquakes, submarine slides, tsunamis, benthic storms, biodiversity changes, pollution and other events that cannot be detected and monitored by conventional oceanographic sea-going campaigns. To understand the mechanisms involved and to forecast natural events long time series of measurements are needed to feed numerical models.

The implementation of a bi-directional link between an observatory and a control station is fundamental to assure the quality of long data series. Three types of observatories are typically described: acoustically linked to a surface buoy, electrically linked to a surface buoy, and cabled. Technology today allows us to build sophisticated deep-sea observational systems. Considerable engineering development work has been done by the NEPTUNE and MARS projects in North America and the DONET project in Japan. NEPTUNE Canada is implementing one of the first deep sea, cabled networks. However, the costs associated with the construction and operation of these systems are high, and funds usually attributed to oceanography are not related to such investments. The ESONET community is highlighting the importance of such infrastructures to governments so that investment in these research infrastructures can take place.

Figure 1: ESONET sites

At the European level, the goal of the ESONET NoE is the lasting integration of European research on deep-sea multidisciplinary observatories and the creation of a network of excellence. Over the initial 4 years, the approach will be to merge the programmes of member organisations through research activities addressing the scientific objectives and networking activities specially designed for integration and spreading Excellence. Its objective is to produce a practical plan for long-term monitoring of the ocean margin environment around Europe with capabilities in: geophysics, geotechnics, chemistry, biochemistry, oceanography, biology and fisheries. In order to reach this broad objective, it is necessary to organise the deep-sea observatory community around ESONET sites and to unify it around common scientific objectives that must reach the top level of marine research.

1.2 Objectives for the reporting period, work performed and the main achievements in the period

- **Objectives of the reporting period**

During the first year the main ESONET working groups were constituted at WP level and the core groups at each ESONET site were identified.

The main general objectives of this reported period were:

- to increase the level of integration at regional sites by encouraging the involvement of the partners associated with ESONET activities, for instance by encouraging the submission of proposals for the 2nd call for demo missions.
- to encourage integration across ESONET sites, e.g. by preparing a more formal call for exchange of personnel. WP leaders also made efforts to increase participation in their WP activities.
- to stabilise the constituted groups by starting the preparation of a permanent structure (VISO) involving core services, stakeholders and private companies.
- to develop a long term strategy on standards implementation,

to update recent advances in marine research, to garner individual inputs from subject experts with ESONET NoE and elsewhere, as well as to investigate science priorities of various organizations from regional to international level.

- **Work performed and main achievements in**

  - **WP1**

- Exchange of personnel formal call opened, 16 proposals received, 14 accepted. (Deliverable D10)
- Core regional groups constituted: questionnaire sent to each node, encouragement to participate in internal call, support to integration meeting (Arctic, Ligurian node) (WP5 deliverable 24)
- Data infrastructure: during the General Assembly meeting in Faro, Portugal, a 1st Data and Management Council Meeting was extended to incorporate project members of SeaDataNet and EuroSITES to explore common interests and experiences. The WDC-MARE data archive which is integrated into the

ESONET data portal via our panFMP software (see D19 for details) was significantly improved by new data warehouse technology which now allows high performance downloads of large amounts of data. The ESONET Spatial Data Infrastructure (SDI) was designed and developed in close cooperation with WP2. The SDI is largely based on OGC standards, in particular those in charge of the Sensor Web Enablement (SWE). The core component is the Sensor Registry, which holds the sensor and observatory description in SensorML format. A graphical web front-end which allows to create SensorML documents has been completed and currently being tested internally.

- Sustainable integration of ESONET community: preparation of the VISO workshop
- Worldwide collaboration: International Level meeting was organised and an agreement for an international association on sub sea observatories (IASSOO) is ready to be signed.

  - **WP2**

- 3 Reports for demonstration actions regarding Sensor interface, Quality assurance and sub-sea interventions have been issued (D 25, 26, 27). Recommendations for ESONET registration in GEOSS have been given (D35). A survey of testing facilities has been issued (D10 and D36).

  - **WP3**

- The Scientific Objectives Workshop were organised and scientific objectives of ESONET updated. Generic Scientific Modules are defined (deliverables 11 and 13)

  - **WP4**

- 1st Call Demonstration Missions started with the fulfilment of the administrative and technical formalities, and corresponding 1st periodical report issued;
- 2nd Call for Demonstration Missions published;
- Collection, check, and selection of the Demonstration Missions approved for funding under the 2nd call.

  - **WP5**

- Two WGs established – Generic Cable and Standalone Site WG led by Jaume Piera and Olaf Pfannkuche
- LEE database established and environmental atlas in preparation
- LEE data collated in conjunction with WP1
- Initial report to EMSO on implementation strategies submitted and first meeting of ESONET NoE and EMSO took place.
- Initial elements of implementation plans for both WGs are available (D5)

- **WP6**

- The stabilization of the core services definition,
- The development of the cooperation with the private sector, in particular of the ESONET Yellow Pages and
- The preparation of 3 new issues of Esonews newsletter."

- **WP7**

- KDM/JUB proceeded with the translation of outreach pages into 14 EU languages, including the recent ESONET brochure. The system is online and embedded into the ESONET Education pages. http://mars-srv.oceanlab.iu-bremen.de/. Different outreach and training activities are offered: http://mars-srv.oceanlab.iu-bremen.de/eduandoutreach.html. For example quizzes are offered: http://mars-srv.oceanlab.iu-bremen.de/quiz.html.
- ESONET School materials are offered: http://mars-srv.oceanlab.iu-bremen.de/schoolmaterials.html.
- KDM/JUB finished the design of a new web portal for school-age users. It will allow grade 8-13 pupils to get an introduction to ESONET research. The web-portal is online. Most pages have animations, showing ocean changes.
- The CNRS IUEM installed the multimedia system provided by the “Jacobs University Bremen” in Océanopolis:
- JUB translated the quiz in French as well as a poster for the presentation of the programme.
- KDM/JUB sent aquarium terminals to the Brest and Heraklion aquaria, including translated posters with introductions to ESONET. The systems will soon be online.

- **WP8**

- An online reporting tool is operating.
- The General Assembly was held in Faro in October 2008.

1.3 Comment on the most important problems during the period including the corrective actions undertaken

In WP4:

The 2nd Call was issued in month 26 instead of 20: this was due mainly to the time needed to amend the text from the 1st call after the 1st annual reporting process, with acceptance by both SC members and the European Commission Officer. This was resolved before the ESONET General Assembly in month 25 (Oct 2008). A slight delay in the start-up of the DMs selected under the 2nd Call has occurred: the start-up was foreseen in month 24 whereas the actual start-up will be in month 26.
The MOMAR DM cruise planned onboard Ifremer vessel in summer 2009 was cancelled. It will be taking place in summer 2010. So, equipment deployed on the

MOMAR site will be recovered only in summer 2011, after the end of the ESONET project, but real time data will be displayed on the ESONET web site before this date.

In WP6:

Concerning ESONET Core Services, the basic specifications, which are included in the "Core Services Report" were defined recently. Interaction with the ongoing main Earth Monitoring initiatives is still below expectations and must be reinforced in the forthcoming months.

Cooperation with the industry is in progress and the participation of PESOS inside the ESONET network in ongoing. However, we need to gather more private partners, not only as suppliers but also as partners for value-added services. Demo mission activities are likely to facilitate this aim.

The Yellow Pages are not completed as was foreseen; input from private companies is still missing in great part. As a corrective action we have decided to organise a PESOS meeting in Bremen during the IEEE OCEANS '09 meeting (May 2009), to present the ESONET yellow pages, to get feedback and update the material.

Management of WP1 'Networking:'

Activities around data management and data infrastructure for 12 nodes increased significantly this year. WP1 become more and more difficult to manage for the WP leader by including the other 4 tasks, which are not dealing with technical topics. To keep the data infrastructure activity at task level does not allow the description of activities task by task and subtasks and to associate a clear time schedule, nor task leaders.

During the third year of ESONET NoE, integration at regional node level will be critical in the preparation and the launching of legal integration bodies (RLEs) by EMSO PP. This task will be closely linked to the Second All Regions Workshop during which, main achievements per node will be presented, expressing the maturity level of each ESONET region and to the Virtual Institute preparation (VISO). This will demonstrate the increasing integration and networking for the next 18 months

Consequently the previous named task 1b "Data infrastructure" has been moved from WP1 to a new work package: WP9, titled "Networking Data management" led by KDM/UNIHB. This has enabled a clearer program of work to be established with a more clearly defined set of associated tasks and responsible persons.

WP1 "Networking" is now more focussed on integration of regional core groups and the sustainable structure of ESONET NoE.

Delayed payment to partners:

The coordination team had difficulties in gathering all requested budgets for "the second 18 months period" for WPs activities after the first yearly review. This was partly due to the fact that some partners delayed submitting budgetary requests, which were requested in June 2008. In addition the coordination team was involved in the 1st reporting process for a period longer than was initially foreseen (until September2008). Consequently, it was not possible to consolidate all of the requested information before September 2008. The fund attribution was voted on during the SC meeting held during the General Assembly in Faro (Oct 08).

2 WORK PACKAGE PROGRESS OF THE PERIOD

Table 1 – ESONET JPA : Work packages (WPs)				
Work Packages (WPs)	**Integrating Activities (IA)**		**Persons in charge of Task Teams**	
	WP1 Networking		**M. Diepenbroek**	KDM (DE)
		I.a Integration of regional observatory infrastructure	M. Cannat	IPGP (FR)
		I.b Data infrastructure	M. Diepenbroek	KDM (DE)
		I.d Scientific integration	J. Mienert	UiT (NO)
		I.e International cooperation	I.G. Priede	Univ.Aberdeen (GB)
	WP2 Standardisation and interoperability		**C. Waldman**	KDM (DE)
		II.a Sensors and scientific packages	C. Waldman	KDM (DE)
		II.b Quality assurance, Quality control	A. Holford	Univ.Aberdeen (GB)
		II.c Underwater intervention	J.F. Drogou R. Papaleo	Ifremer (FR) INFN (IT)
		II.d Sharing testing facilities	J. Marvaldi	Ifremer (FR)
		II.e Contribution to GEOSS standardisation and implementation activities	E. Delory	DBSCALE (ES)
	WP5 Implementation strategies		**M. Gillooly** **F. Grant**	Marine Inst. (IE)
		V.a Science, engineering and business plan for generic sites	J. Piera O. Pfannkuche	CSIC (ES) KDM (DE)
		V.b Legal, Ethical and Environmental	M. André G. André	UPC (ES) ALTRAN (FR)
		V.c Comparative work – Both working groups		
		V.d Reporting to EMSO	R. Person	IFREMER (FR)
	Jointly Executed Research (JER)			
	WP3 Scientific objectives and observatory design		**H. Ruhl**	NOCS (GB)
		III.a Science objectives	H. Rulh	KDM (DE)
		III.b Generic science modules	G. Greinert	NIOZ (NL)
		III.c Specific science modules	L. Geli	Ifremer (FR)
	WP4 Demonstration missions		**L. Beranzoli**	INGV (IT)
		IV.a Call for proposal	M. Cannat	IPGP (FR)
		IV.b Demonstrations		CSIC (ES)
	Spreading Excellence (SE)			
	WP6 Socio-economic users		**J.M. Miranda**	Univ. Lisboa (PT)
		VI.a Core services stakeholders	J.F. Rolin	Ifremer (FR)
		VI.b Regional services stakeholders	N. O'Neill	CSA (IE)
		VI.c Promotion and SME policy		
		VI.d ESONEWS		
	WP7 Education and outreach		**L. Thomsen**	KDM (DE)
		VII.a Educational tools	T. Tselepides	HCMR (GR)
		VII.b W web portal with real time web interface	A. Colaço	Univ.Azores (PT)
		VII.c Communication of results		
	WP8 – Management Activities (MA)		**R. Person**	Ifremer (FR)
		VIII.a General Assembly	I. Puillat	
		VIII.b Meeting organisation	JF. Rolin	
		VIII.c Information management and yearly reporting	V. Le Guen C. Desbois	
		VIII.d Link with European Commission		
		VIII.e Link with European projects		
		VIII.f ESONET label		

2.1 WP 1 – Networking

Persons in charge: **Michael Diepenbroek** (mdiepenbroek@pangaea.de)
Contact: +49 421 218 65590
Institution: KDM/Universität Bremen (KDM/Uni-HB)

Names and institutions of the participating persons:

Task	**Persons in charge of Task Teams**	
WP 1 NETWORKING		
1a) Integration of regional observatory infrastructure	M. Cannat	IPGP
1b) Data infrastructure	M. Diepenbroek	UNIHB
1d) Scientific integration	J. Mienert	UiT
1e) International cooperation	I.M Priede	UniABDN
Names of other participants (and institutions names): See after each task		

2.1.1 Work package objectives and starting point of work at beginning of reporting period

Task 1a: to develop strong links between regional nodes of a European network of subsea observatories and to promote multi-disciplinarity and transnationality within each node

Task 1b: standardized data flow and services in a commonly usable network

Task 1d: integration of ESONET into the international earth observation framework

Task 1e: international cooperation at a worldwide level

2.1.2 Progress towards objectives – tasks worked on and achievements made

Task 1a) - Integration of regional observatory infrastructure

Activities 1a1&2: exchange of personnel

(refers to D10 for details).
We prepared, posted and processed a formal call for exchange of personnel between the ESONET members involved in various nodes. The call was launched in September 2008 for a deadline in November 2008. We collected sixteen proposals. These proposals involve 17 partners altogether, for visits of 2 days to 10 months. Seven projects have a strong methodology and/or technical component. The other projects are focused on observatory science. The requested budget for each proposal is between 3,200 and ~40,000 euros, and the total requested budget is

233,463 euros. A summary of each proposal was prepared for the ESONET Steering Committee, whose members met electronically in December for an initial ranking of the proposals. Following this electronic meeting, requests for additional information were sent to the proponents of 4 projects, with recommendations to coordinate and merge for 2 projects. Upon receiving this additional information, the Steering Committee met in January 2009 and decided to fund 13 projects. This decision was announced to the proponents by letter in March 2009. This letter contained an explanation of the reporting procedure expected upon completion of the exchange, as well as a reporting form.

Activity 1a3: All Regions Workshop

The **second ESONET All Regions Workshop** will be held in Paris from October 5th to 7th 2009 at the CNRS headquarters. The date and locations were announced to the ESONET work package leaders and node coordinators. The nominations for the organizing committee are being completed and first contributions by partners are being collected.

Activity 1a4: Constitution of Regional Implementation Groups

During the first ESONET "**All Regions Workshop**" in Barcelona in fall 2007, we identified two persons per prospective ESONET node to act as "node coordinators". With the help of the Atlantide team of Altran partner, and in coordination with WP5, we then elaborated a questionnaire to gather information on existing site survey data, on infrastructure requirements, and on the names of persons in charge of various aspects of planning observatory experiments at each observatory node. This questionnaire was advertised and posted online.

This table shows the updated list of ESONET node coordinators:

Node #	Node name	Contact persons
1	Artic	T. Soltwedel (AWI), M. Klages (AWI)
2	Norwegian Margin	J. Mienert (Univ. Tromso), D. de Beer (MPI-MM)
3	Nordic Sea	P. Sigray (Stockholm univ.)
4	Porcupine	F. Grant (IMI), M. Gillooly (IMI), O. Pfannkuche (IFM-GEOMAR)
5	Azores	A. Colaco, R. Santos, Maria Gabriella Queiroz (Uaç), Miguel Miranda (FFCUL), Mathilde Cannat (IPGP), Pierre Marie Sarradin (IFREMER)
6	Iberian Margin	L. Matias, M. Andre (UPC-CSIC), N. Zitellini (ISMAR)
7	Ligurian Sea	J.J. Destelle (CPPM), S. Escoffier (CPPM), G. Gorsky (LOV)
8	East Sicily	L. Beranzoli (INGV), P. Favali (INGV), R. Papaleo
9	Hellenic	V. Lykousis (HCMR), T. Tsellipides (HCMR)
10	Marmara Sea	N. Cagatay (ITU), L. Géli (IFREMER)
11	Black Sea	L. Dimitrov (IO-BAS), H. Sahling (Univ. Bremen)
12	Koster Fjord	L. Thomsen (Jacobs Univ.), L. Lundalv (Goteborg Univ.)

During this reporting period, we compiled the answers and used them to nominate more people in each **regional implementation committee**, in addition to the two node coordinators, which were nominated at an earlier stage. This stepwise approach to the constitution of these committees is justified by the fact that planning

at most nodes is currently ongoing, so that our action is not just to collect information, but also to promote further structuration at each node.

In this respect, this reporting period has seen particular progress regarding the Arctic and Ligurian nodes, and the Call for Demonstration Missions (WP4) has provided an efficient tool for this progress. For the Arctic node, two separate teams had submitted independent Demo-Missions proposals (ARCOONE and MASOX). The ESONET Steering Committee recommended that these two proposals be merged and the resulting project resubmitted to the second call for demonstration Mission (see WP4 report). Following submission and selection of this unified Demo-Mission project, an Arctic workshop was been organised by NIOZ in Texel (Netherlands) the 18-19 Feb. 2009. This workshop involved more than 50 participants and was supported by ESONET. More information can be found on **www.nioz.nl/arctic**
Concerning the Ligurian side, the calls for Demo-Mission projects also played a positive role for the building the community. The project proposed for this node (MOTTO, 2nd Call of WP4) was not selected for ESONET funding, but the community involved at this node is now clear.

In more detail, the activities concerning this task during this reporting period were:

- Creation of a data mining questionnaire,
- Transmission of the questionnaire to the identified ESONET node coordinators, and broader diffusion through the WPs structure and on the ESONET website
- Analysis and display of information returned by the ESONET members
- Presentation of intermediary results during the ESONET General Assembly
- Writing of a draft report distributed to members during the ESONET General Assembly
- Compilation of a list of people in charge of various aspects of planning and implementation at each ESONET node.
- Transmission of these lists to the node coordinators for modifications and approval. At this point, only Sicilian and Iberian nodes did not answer. Once approved, these lists will form the basis for nomination of members of Regional Implementation Groups. We plan to effect these nominations over the next few months.

As an example, this table shows the preliminary list of persons in charge of the Iberian node. This list must now be verified and amended by the Iberian node coordinators.

Iberian Margin NODE					
Function	**Name**	**Institution**	**Discipline**	**email**	**Address**
Coordinator	Michel André	UPC	Bioacoustics	Michel.Andre@upc.edu	Universitat Politècnica de Catalunya 08034 Barcelona Spain
Contact persons	Michel André	UPC	Bioacoustics	Michel.Andre@upc.edu	Universitat Politècnica de Catalunya 08034 Barcelona Spain
	Luis Matias	FFCUL	Seismology	lmatias@fc.ul.pt	Campo Grande ED C4-3O Piso Lisboa Portugal

Iberian Margin NODE						
Function		**Name**	**Institution**	**Discipline**	**email**	**Address**
		Nevio Zitellini	ISMAR	Geology/Geophysics	nevio.zitellini@bo.ismar.cnr.it	ISMAR Istituto di Scienze Marine, Geologia Marina, Via Gobetti 101, 40129 Bologna
Principal Investigators		Michel André	UPC	Bioacoustics	Michel.Andre@upc.edu	Universitat Politècnica de Catalunya 08034 Barcelona Spain
		Christoph Waldmann	Univ. Bremen	Marine and Coastal Engineering	waldmann@marum.de	Bremen University, MARUM Leobener Str. 28359 Bremen Germany
		Jorge Miguel Miranda	FFCUL/CGUL	Geosciences	jmiranda@fc.ul.pt	Campo Grande ED C4-3O Piso Lisboa Portugal
		Paolo Favali	INGV	Geophysics	paolofa@ingv.it	INGV Via di Vigna Murata 605 00143 Rome Italy
		Nevio Zitellini	ISMAR	Geology/Geophysics	nevio.zitellini@bo.ismar.cnr.it	ISMAR Istituto di Scienze Marine, Geologia Marina, Via Gobetti 101, 40129 Bologna
		Giorgio Riccobene	INFN	Physics	riccobene@lns.infn.it	INFN Via Enrico Fermi 40 - 00044 Frascati Rome Italy
		Juan Josè Danobeitia	CSIC	Marine Geophysics	jjdanobeitia@cmima.csic.es	
		Eric Delory	dBScale	Acoustics	eric@dbscale.com	C/Leon y Castillo 25, 35200 Telde - Spain
		Gianni Pavan	CIBRA	Bioacoustics	gpavan@cibra.unipv.it	Via Taramelli 24 - 27100 Pavia - Italy
		Hans W. Gerber	TFH Berlin	Mechanical research and development	hwgerber@ism.tu-berlin.dr	Technische Fachhochschule Berlin Luxemburger Straße 10 - 13353 Berlin Germany
		Francesco Gasparoni	Tecnomare	Electronics	francesco.gasparoni@tecnomare.it	Tecnomare SpA - San Marco, 3584 - 30124 Venice, Italy
		Eulàlia Gràcia	CSIC	Sedimentology	egracia@utm.csic.es	
Technical STAF						
Data managers contact						
STRAC referents	**Portugal**	Mario Ruivo	University of Lisboa	Biological Oceanography and management of living resources	cointersec.presid@ftc.mctes.pt	Faculdade de Ciências, Universidade de Lisboa Campo Grande, Edificio C8, Piso 3 1749-016 Lisboa Portugal
	Italy	Angela Vulcano	INGV/ Ministry of University and Research	Administrative	angela.vulcano@miur.it	INGV Via di Vigna Murata 605 00143 Rome Italy
	Germany	Sören Düerr	KDM	Geology and Palaeontology	Soeren.Duerr@dfg.de	Kennedyallee 40 53175 Bonn, Germany
	Spain	Beatriz Morales Nin	CSIC		beatriz.morales@uib.es	
	France	Bruno Goffé	CNRS-INSU	Directeur adjoint scientifique science de la terre	bruno.goffe@cnrs-dir.fr	INSU 3 rue Michel-Ange, 75794 Paris Cedex 16

Information relating to the integration progress in the ESONET node is detailed in WP5 Deliverable D24 led by IFREMER.

Remark: The milestone M18 “Constitution of All RLE (Regional Legal Entities)” should be read as “Constitution of Regional Group” (Done). Indeed, the constitution of the Legal Entities associated with these groups is no longer an ESONET task but an EMSO PP task. EMSO PP, led by INGV, started in mid-April 2008, after the first yearly report of ESONET and the establishment of the next ESONET programme of Activities.

Person in charge: **Mathilde Cannat**, IPGP
Involved partners: IFREMER, CNRS-CEREGE, CNRS-LMGEM, CNRS-CPPM, CNRS-IUEM, KDM/IFM-GEOMAR, KDM/AWI, KDM/Uni-HB, INGV, ISMAR, NERC-NOCS, HCMR, IMI, Uaç, UPC, UGOT, MISU-SU, IO-BAS, ITU, KOERI, DEU-IMST, ALTRAN

Task 1b) – Data infrastructure

Activity 1b1: Data management plan

A preliminary structure of the **data management plan** is available online: (http://wiki.pangaea.de/wiki/Data_and_information_management_plan) and will be extended with demonstration missions specific information. During the General Assembly meeting in Faro, Portugal, a **1st Data and Management Council Meeting** extended to project members of SeaDataNet and EuroSITES took place to explore common interests and experiences.
The **data management group**, constituted the previous year, is working closely together with the **data management council**. The group consists of representatives of ESONET demonstration sites, IFREMER, WDC-MARE, EuroSITES and SeaDataNet. The first report of the data management group was issued after the Data management meeting held in Faro and is included in Deliverable D31 (Milestone M1-21)
The participation of partners in large programs such as MERSEA, HERMES-IP, KM3Net, SEAHELARC, EUR-OCEANS, MARBEF, SEASAME-IP, TRANSFER, HERMIONE, which all have substantial data management activities, provides important relevant data and scientific information and experience.

Data management issue regarding tsunami warning system was addressed by several teams (including ESONET partners) in various projects, a strong link is planned with their achievements.

Activity 1b2: ESONET knowledge base

The knowledge base is an extension of the topology of existing regional observatories (http://dataportals.pangaea.de/esonet/index.php/map). It was developed as a generic system to store any available information on the ESONET project, e.g. data on observatories, institutions or persons in charge.

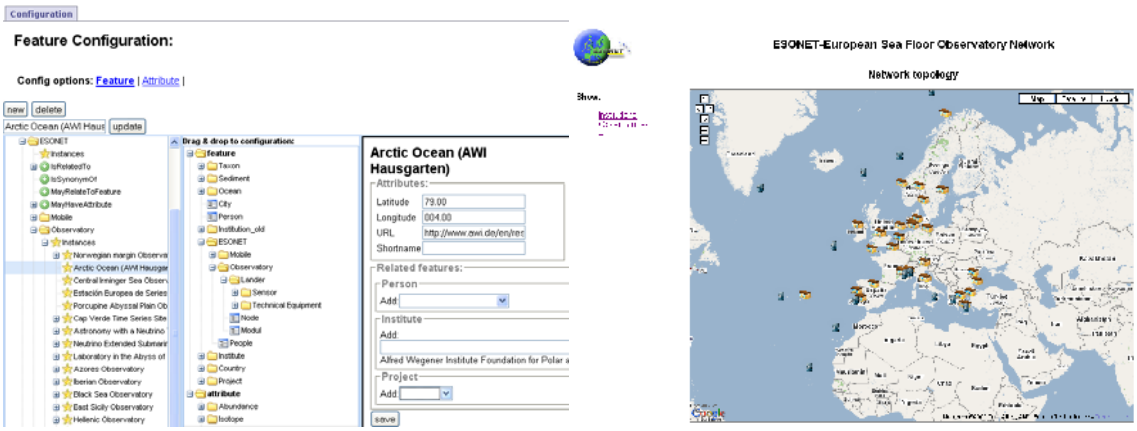

Fig 1.1. The knowledge base entry module (left) and the ESONET topology of institutes and observatories as example output

It further allows relating these pieces of information to each other as well as to external data sources. Its structure was designed according to OGC standards for feature cataloguing using most up-to-date Web 2.0 technologies such as Ajax.
The WDC-MARE data archive which is integrated into the ESONET data portal via our panFMP software (see D19 for details) was significantly improved by new **data warehouse technology** which now allows high performance downloads of large amounts of data. This service is available at http://www.pangaea.de for registered users.
In cooperation with WP2 the topology, data and information plan, sensor registry and QA/QC methodology were comprised in a common web structure, the **ESONET data and information portal**. This portal can be extended by possible information inventories from further tasks. Data mining in collaboration with activity 1a3 will bring up additional knowledge, in particular site survey information and the different sites. Merging the sensor registry input with a database on science objectives and sensors was suggested and is being discussed.
Furthermore, we added our newly developed **panmetaworks** to the ESONET portal. Panmetaworks is an online collaboration tool to upload and share documents and data among project members.

Activity 1b3: ESONET Spatial Data Infrastructure

The ESONET **Spatial Data Infrastructure (SDI)** was designed and developed in close cooperation with WP2. The SDI is largely based on **OGC** standards, in particular those in charge of the **Sensor Web Enablement** (SWE). The core component is the Sensor Registry, which holds the sensor and observatory description in SensorML format.
A graphical web front-end which allows to create SensorML documents has been completed and currently internally tested. SensorML documents are stored in a native XML database (eXist), which will also be used as the base repository for the sensor registry's catalogue service (**CSW**). Several available CSW servers tools have been tested but these do not sufficiently support SensorML. Therefore, we started to develop a new eXist based CSW. Initial steps towards a OGC conform CSW application profile have been defined.

Additionally, an OGC conform **SOS** server will serve as a data access standard for observatory data. A first demo was set up by Ifremer and tested, focusing on a first step for time-series observations.
Open Source software will be used as much as possible for the ESONET SWE implementation. This is a common approach with the German *Tsunami Early Warning System* which for example uses the 52°North (http://52north.org) SOS server software we are currently also testing for ESONET suitability.

In September 2009, the **Tempo-Mini** station was deployed on the VENUS observatory in Canada. Since then, every 30 minutes, a 3-minute video of Canadian seafloor is remotely activated from Brest and broadcasted in real-time. Tempo-Mini is an instrument developed by IFREMER that includes e.g. a video camera, thermistance chain and oxygen sensor.
Images and data are transmitted in real-time to the onshore cable station in Saanich Inlet, then to the University of Victoria (UVic). A VPN (virtual private network) set-up between IFREMER and UVic allows a continuous recording of the Tempo-Mini instruments' data flow.
A server dedicated to the management of these data was set up in IFREMER. The server remotely enables/disables the projectors in Canada and performs a video acquisition every 30 minutes. The video streaming (3 minutes) is recorded on the IFREMER server. The server is a Linux Debian virtual machine managed by a XEN hypervisor. Up to now, 5 months of observation were collected in real-time. Everyday, a video snapshot is distributed through a mailing list**.** The oxygen observations are collected once a day. They should be available in the near future through the OGC-SOS protocol cited above.

The possible standardization of data acquired by the **sub sea observatory station SN1** (LIDO) for the presentation and distribution of acquired data to other partners was analysed and a detailed data management concept and work flow was developed for the **LIDO mission**. In order to achieve this, data were analysed on recorded samples from previous deployments and the analysis codes developed accordingly. The codes will be ready in spring 2009. The proposed data processing work flow is as follows:
Raw data will be streamed from four channels to local servers for RT analysis: sea noise will be discarded (except for low frequency components which would be of use in oceanography) and the resulting acoustic events will be RT classified into different categories (Biological, e.g. dolphins, whales, etc.; Natural, e.g. seismic events, etc.; Artificial, e.g. shipping, etc.), stored locally and made available to third parties (registered users only). Raw data from one channel will be compressed and stored. One channel will also be devoted to real-time public access in mp3 format. A sound library will allow the public to go back in time to stored events with interesting acoustic information. Statistical analyses will be extracted from time series and made immediately available to the public. An autonomous hydrophone acoustic data archive and dissemination system with specifications of possible data and request formats is being developed.

Person in charge: **Michael Diepenbroek**, KDM/Uni-HB
Involved partners: IFREMER, CNRS-IUEM, KDM/JUB, NERC-NOCS, HCMR, UPC, SEND

Task 1d) – Scientific integration

Activity 1d1&2: organisation of Virtual Institute (VISO) workshop and its reporting

A workshop to start the implementation of a **virtual institute** named **VISO** is being organized for June 2009. The VISO steering committee was formed, the meeting facilities were booked, and the draft agenda was approved. An invitation to the hydrocarbon industry is pending for participation. Norwegian regional observatory initiatives were linked and a national strategy for observatory sites was implemented including a website.
Various workshops and meetings with the aim of reaching technical and scientific integration among the interested parties took place. An important discussion item in these meetings was how to organize VISO so that it can meet the many science themes and program interests that are likely to be part of the ESONET NoE VISO and EMSO as well.

The VISO Steering Committee is composed of :

- Jürgen Mienert Prof, UiT, Norway
- Bénédicte Ferré PhD, UiT, Norway
- Peter Haugan Prof, UiB, Norway
- Stein Kaartvedt Prof, UiO, Norway
- Anne Hageberg, CMR, Norway
- Carlo Heip Prof, NIOZ, The Netherlands
- Kate Larkin PhD, NOCS, United Kingdom
- Ian Wright Prof, NOCS, United Kingdom
- Michael Diepenbroek PhD, MARUM, Germany
- Antje Boetius Prof., AWI, Germany
- Roland Person PhD, IFREMER, France
- Ingrid Puillat PhD, IFREMER, France
- Monty Priede Prof, UNIABDN, United Kingdom
- Paolo Favali Prof, INGV, Italy
- Laura Beranzoli PhD, INGV, Italy
- Ståle Johnsen PhD, StatoilHydro, Norway

The VISO preparation document is Deliverable 37 delivered in March 09

person in charge: **Juergen Mienert**, UiT
involved partners: CNRS-IUEM, KDM/AWI, KDM/Uni-HB, NERC-NOCS, HCMR, IMI

Task 1e) – International (worldwide) cooperation

Activities 1e1&e:2

- Cooperation was initiated with the **Lamont Doherty Earth Observatory (LDOE)** and the **Scripps Institution of Oceanography (SIO)**. Long lasting cooperation was also initiated with the **Pacific Marine Environment**

Laboratory (NOAA & Oregon State University) at Newport OR, regarding the development and deployment of autonomous hydrophone arrays in the Atlantic and Indian oceans.

- ESONET partners were invited to test the deep-sea magnetic observatory (OMFM) on **MARS in California**, but MARS was at that time out of order. Implementing the OMFM on **ANTARES** proved to be difficult: no node is yet available, adapting and installing the OMFM is very costly, particularly with respect to the low scientific return (it is much cheaper to install a magnetic observatory on-shore nearby). This project will not be pursued.
- Collaboration with **VENUS** and **NEPTUNE** to implement the Real-Time Acoustic Data Management Architecture and software developed in LIDO. However, this network is not yet operational.
- ESONET partners participated in the data management workshop at **NEPTUNE Canada**, further collaboration with Neptune Canada is planned (MOU planned). They will be one of the data providers for the ESONET data portal. ESONET partners are participating in the Neptune Canada project and actively participate in the preparation of the US cabled observatory. Tests with EU equipment were performed off Vancouver Island and a new ROV transport technology was tested with Jacobs Universities Crawler.
- Links to the **Q2O project** were built up.
- ESONET partners participated in several **GEOSS** related meetings and workshops.
- Frequent telephone conferences with **Mbari** took place, subsequently leading to interoperability experiments (**OGC** organized).
- Participation in a kick off meeting of the **ION successor** project in Vienna (see activity 1e3 below).
- The **Ridge 2000** community invited the MoMAR-D coordinators to participate in the RIDGE2000 workshop in order to present the initiative.

Deliverable D 34 gathers MOUs signed within the framework of ESONET.

Activity 1e3: follow-up of the international network for observatory development, signature of MoU

- In order to set up an official worldwide observatory network several meetings involving participants of other observatories' initiatives in the world were organized and reported in deliverable 33:
  - a meeting in Tokyo on the International Association of Sub-Sea Observatory Operators (IASSOO) organized by JAMSTEC on March 10-11th, 2008 (NEPTUNE Canada, IOO, MACHO, ION were represented).
  - a meeting in Vienna on April 18th with ESONET, EUROSITE and DONET on the same subject
  - a meeting in San Francisco with NEPTUNE Canada, OOI, MACHO on December 18th.
- A MoU has been prepared and should be signed mid 2009 (deliverable 33):

UNIABDN prepared a first proposal for an International Association of Sub-Sea Observatory Operators, IASSOO. This was circulated worldwide and discussions were held at the Scripps Institution of Oceanography, California, with representatives from Japan, 8-15 September 2008, and it was agreed that the proposal from ESONET NoE should be aligned with an existing parallel proposal from Japan. With help from IFREMER, a modified IASSOO proposal was circulated among partners in Europe, USA, Japan, Canada and was accepted as a working framework for future co-operation. Regular IASSOO meetings are being scheduled between the co-ordinator of ESONET NoE and other parties. Participation in IASSOO has now been transferred to WP8 as a management activity of ESONET NoE for the third ESONET period.This Agreement for International Workshops is presented in Deliverable D33.

Person in charge: **Imants G. Pride**, Univ. Aberdeen
Involved partners: IFREMER, CNRS-CEREGE, CNRS-IUEM, KDM/Uni-HB, KDM/JUB, INGV, ISMAR, NERC-NOCS, HCMR, FORTH, Uaç, LAB-UPC, UGOT, IO-BAS, ITU, DEU-IMST

2.1.3 Deviations from the project work programme, and corrective actions taken

Deliverable D10 was slightly delayed due to the delay in opening the Call for exchange of personnel.
Agreement for an international network was ready in month 23 as foreseen (Deliverable 33) but the signature is delayed due to the non-availability of persons involved. The signatures should be done in May 2009 with the IEEE OCEAN'S 09 meeting, in Bremen. (Milestone M18).

2.1.4 Deliverables list

Del. no.	Deliverable name	Work package no.	Date due (proj.month)	Actual/ Forecasted delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
D10	Report: exchange of Personnel; common schedule and methodology of tests	WP1	18	23			IFREMER
D19	Data infrastructure prototype	WP1	18	18			KDM/UNI HB
D33	Agreement on an International network	WP1	23	23			UniAB DN
D34	Plan for signature of MOU and contracts at international level. First signature of an agreement for testing of a prototype on NEPTUNE Canada (or Arena Japan or MARS USA)	WP1	23	23			UNIABDN

Del. no.	Deliverable name	Work package no.	Date due (proj.month)	Actual/ Forecasted delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
D37	VISO Workshop preparation report	WP1	24	24			UiT

(*) if available

2.1.5 List of milestones:

Milestone no.	Milestone name	Work package no.	Date due (month)	Actual/Forecasted delivery date	Lead contractor
M1-18	First evaluation of staff exchange	WP1	18	23	IPGP
M1-18	Constitution of all RLE	WP1	18	18	IPGP
M1-18	Portal for Data infrastructure prototype on ESONET website	WP1	18	18	KDM/UNIHB
M1-21	First report of the data management group	WP1	21	21	KDM/UNIHB
M1-24	Evaluation of virtual institutes	WP1	24	24	UiT
M1-24	Plan for signature of MOU or contracts at international level. First signature of an agreement for testing of a prototype on NEPTUNE Canada (or ARENA Japan or MARS)	WP1	24	24	UNIHB
M1-24	Agreement on an International network	WP1	24	26	UNIHB

2.2 WP 2 – Standardization and Interoperability

Persons in charge: **Christoph Waldmann** (waldmann@marum.de)
Contact: +49 421 218 65606
Institution: Universität Bremen (UNI-HB)

Names and institutions of the participating persons:

Task	Persons in charge of Task Teams	
WP 2 STANDARDIZATION AND INTEROPERABILITY		
2a) Sensor interoperability	Christoph Waldmann	KDM-UniHB
2b) Quality assurance, Quality control	Anne Holford	UniAbdn
2c) Interoperability for underwater intervention	Jean- Francois Drogou	IFREMER
2d) Sharing testing	Jean Marvaldi	IFREMER

facilities		
2e) Contribution to GEOSS standardization and implementation activities	Eric Delory	dBScale
2f) Organization of the second Best Practices Workshop at IFREMER	Christoph Waldmann	KDM-UniHB
Names of other participants (and institutions names): Jesper Zedlitz, Norbert Luttenberger University of Kiel, Germany Yves Auffret , IFREMER		

2.2.1 Work package objectives and starting point of work at beginning of reporting period

Task 2a: to develop a strategy for evaluating sensor interface standards and demonstrate the applicability

Task 2b: to set up a quality management framework in regard to operational considerations within the framework of ocean observatories

Task 2c: to come up with recommendations on underwater intervention procedures within the framework of ocean observatories

Task 2d: increased capabilities and shared usage of existing facilities (moved from 1c)

Task 2e: to find links to GEOSS activities

Task 2f: to evaluate results from the first ESONET Best Practices Workshop to plan for the goals and implementation of the second Best Practices Workshop

2.2.2 Progress towards objectives – tasks worked on and achievements made

Task 2a) – Sensor interoperability

Activity 2a1: **Specification report for demonstration actions-sensor interface**
The report for the demonstration actions-sensor interfaces, Deliverable D25, is based on a template document, the so-called interface control document (ICD), that is also used in software development projects. It was adapted for the current task by adding hardware-related descriptions. The report helps in achieving interoperability between different installations, which in a first step means a comprehensive description of mechanical and electrical interface specifications. This document is understood as a living document that will undergo future revisions.

Activity 2a2: **Contribution to ESONET sensor registry: standardised hardware implementation concepts**
This activity's contribution to the sensor registry focuses on electrical interface issues as described in standards like IEEE 1451, CanOpen or other fieldbus systems. Similarities in the standard schemes were extracted allowing for recommendations as regards converter modules that convert between the proprietary interface protocol of a sensor system and the according standards. As a result it was found that IEEE 1451 concepts are sufficiently generic and allow for the integration of most existing non-standard processing schemes. This also applies to the metadata description that

allows for a mapping between IEEE 1451 and concepts like Sensor Web Enablement (SWE). However, there is still a gap to higher-level processing steps, as for instance SWE, that has to be bridged. Interoperability experiments already conducted or to be planned in the future with a global partnership (Europe, USA, Canada) will help to solve this issue. An international partnership was set up with the aim to continually discuss interface-related issues within the group. The outline of the first interoperability experiment at the World Summit - Ocean Observing Systems conference in St. Johns, Canada, in October 08 was defined in close cooperation between MBARI and OGC (Open Geospatial Consortium, for reference to the activities check the following web page:
http://www.openioos.org/real_time_data/sos_esonet.html).
Three ESONET groups set up a sensor system fulfilling the standard requirements for this experiment. The WP2 group sees its task not just as getting involved in the technical work but also as promoting the use of the developed standard concepts. This involves the presentation of the results in conferences but also getting students and other institutions involved in these activities. In Europe the core team consists of IFREMER, UPC, UniABDN, Kiel University and the company dBScale as a representative of SMEs involved in ESONET.
A number of meetings with the ESONET partners were organised to disseminate the developed ideas and concepts. Through the involvement of the WP2 participants in different demo missions close links between the activities were established.
Additionally a proposal for exchange of personnel was submitted and selected to enhance the communication between the groups involved.

Activity 2a3: **contribution to ESONET sensor registry: metadata description**
The WP2 group's contribution to the sensor registry activity comprises the standardised description of an instrument to be deployed within an observatory, a basic set of metadata necessary for a unique identification and interpretation of the data source. It consists of static (type, model no.) and dynamic features (sampling scheme, position). Not all existing standards are compatible with these requirements. Therefore within the first implementation phase only a subset of the required specifications can be used for the sensor registry. A basic description of workflows for describing the integration of individual sensors into a network and the subsequent operation of the system is of importance to allow checking the proper functioning of the instrument and to ensure high quality of the collected data. This is summarised in the series of specifications reports for the demonstration missions. A close link to other international initiatives will ensure an adequate dissemination and acceptance of the derived concepts. Typically, weekly telephone conferences with partners from ESONET and interested institutions in Europe (IFREMER, University of Barcelona, Kiel University, University of Aberdeen, Bremen University) and from international institutions (MBARI, NIST, OGC, NEPTUNE Canada) are held to discuss and promote developed concepts.

Activity 2a4: **generic functional diagram of an ocean observatory**
The idea is to develop a generic functional diagram for ocean observatories. This is important to ensure that between observatory operators and users a clear understanding of the process flow exists. The WP2 group has started to work on that task and will continue in close cooperation with similar tasks in WP3 and WP5.

Task 2b) – Quality assurance, Quality control

Activity 2b1: Identification of important quality aspects for generic sensor packages

In order to develop the beginnings of an ESONET quality control system the following tasks were identified as the building blocks for a Quality Management System (QMS):

- Documentation control
- Interface control
- Test/integration validation

In general, Quality Management Systems describe the standards and procedures to be used or implemented by the organisation to demonstrate and trace, for each system/sub-system, how each phase conforms to the quality control process. Standards and procedures can either be written by the organisation or developed from existing internationally agreed ones such as IEEE or ISO standards. The Quality Control Manual should contain document reference numbers which uniquely identify a given standard or procedure to a given quality control process.

An example of such a system for a software development project would be as follows:

*Design Phase
- User requirements Specifications
- Functional or Architectural design Specifications
- System requirements Specifications
- Interface control Specifications
- Detailed system or subsystem Specifications
- Database Specifications

*Integration Phase
- Test Specifications
- Acceptance Specifications
- Integration Specifications

*Implementation phase
- Project Plan
- Quality Plan & Risk Analysis
- Data Quality Procedures
- Software Control Procedure
- Design Review Procedure
- Code Review Procedure
- Software Release Procedures
- Software Maintenance Procedures

The idea underlying a QMS system is to have all these documents available at the start of the project. Each one of these identifies the format and contents of each specification and the detailed procedures that must be implemented to demonstrate compliance. All documentation produced by the developers and implementers should conform to these agreed standards and procedures thus ensuring the quality is maintained and requirements are traceable.

These documents are interlinked as shown in figure 2.1 and a traceability matrix should ensure, for instance, that each user requirement is satisfied by a functional entity and system or software component, that each interface addresses the relevant communication needs, that each test specification exercises in full a particular component, etc. In some instances issues affecting the design may have repercussions on interfaces, user requirements, project plans, risk analyses, etc. All relevant documentation should be updated, reviewed and re-issued before the change is implemented.

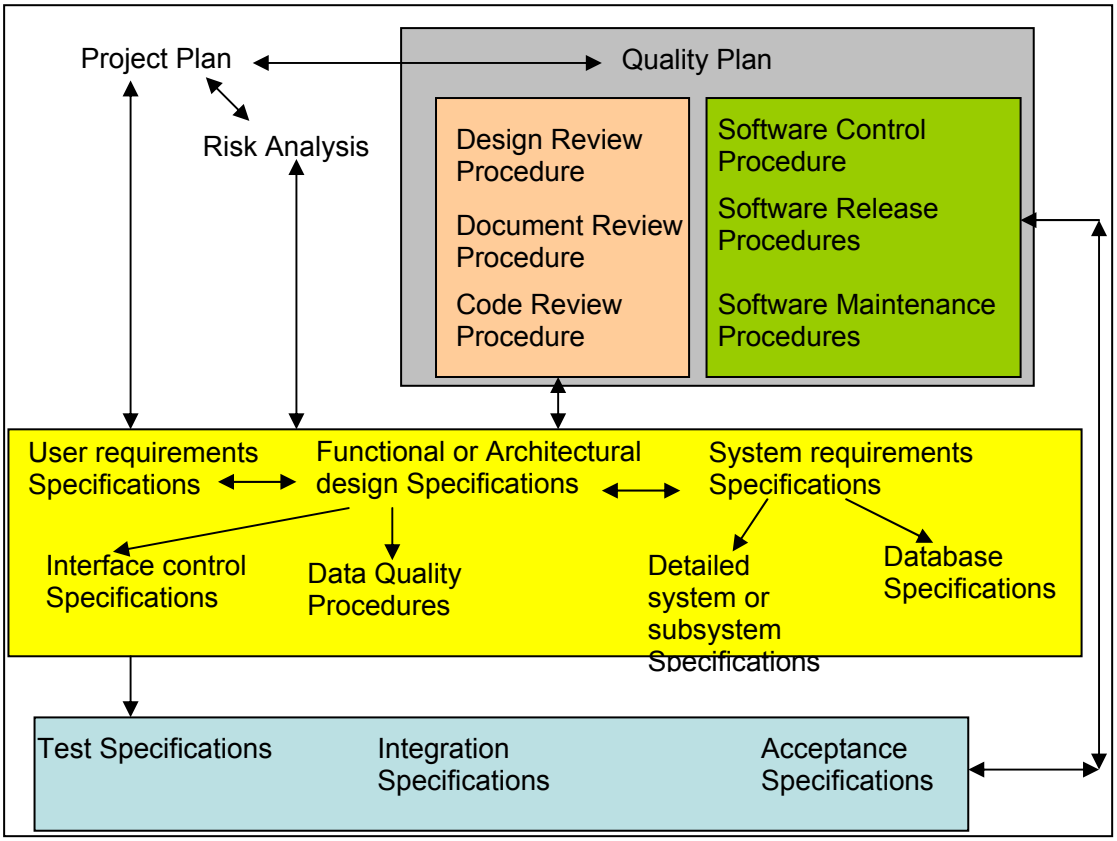

Figure 2.1 Example of a QMS for a software project

In the case of ESONET, due to the nature of the Network of Excellence and the many institutions involved, the implementation of such a QMS system will probably necessitate a staged implementation. The following stages were proposed:

- Define a standard set of documents that must be adopted/provided by the demo missions wherever possible
- Define a set of procedures for testing, deploying, commissioning, maintaining, operating and decommissioning deep-sea observatories and their instrumentation
- Define a set of data quality control criteria to calibrate and validate the data before dissemination to the stakeholders
- Identify a generic sensor package which will conform to the standards and provide the mechanism for evaluating the standards and procedures and establishing the ESONET Quality Label

Activity 2b2: Publication of draft reports for approval during the 2nd Best Practices Workshop.

Together with WP3 instrument types, the generic sensor package was identified and draft versions of the abovementioned documents for these instruments were created. Possible existing test bed facilities for validating test procedures were identified.

Activity 2b3: Specifications report for demonstration action –Quality assurance

The report for the demonstration actions- quality assurance is based on structures that are also used in software development projects. It was adapted for the current task by setting up a framework applicable to all other specifications reports for the demo missions. Therefore the document was called Quality Plan which indicates that it gives guidance on how to use the individual reports and how they are interrelated. This document, Deliverable D26, is an evolving document that is reviewed, updated and expanded regularly.

Task 2c) – Interoperability for underwater intervention

During the ESONET 2008 Best Practices workshop, held in Bremen, WP2 identified 4 items regarding levels of interoperability for work tasks' definitions to optimise intervention time and efficiency, as well as to ensure the interoperability of the various users' equipment:

* **Item1 - Precise technical conditions for enlarging/increasing the number and flexibility of welcoming vessels**: such an action will guarantee that any European ROVs could be easily launched from several European ships, in order to avoid unnecessary transit times and/or transport costs.

*** Item 2 - Facilitate exchange of sensors, equipments, payloads** on the different vehicles, by "standard" interfaces.

*** Item 3** - Provide the scientific users and operators with standard **qualified procedures or recommended practices** to operate equipment in a safe and productive way.

*** Item 4** - Provide **recommendations for training (crew) and testing (procedures)**

The first two items are now mainly covered by different European initiatives (Ocean Facilities Exchange Group (OFEG) – EUROFLEET 2008).

The two last items represent the D27 deliverable managed by IFREMER.

The document is structured by the various steps of the construction and maintenance of an underwater observatory [Site surveys-Module lifting-Cable laying & underwater connections-Inspection & Maintenance work-Training & Testing]. It includes three main axes of development:

1 – Review of existing standards in offshore industry and the possible benefits for the scientific community.

2 - Review of company or institute specifications

3 - General recommendations for marine science observatory interventions.

The document presents general recommendations, taking into account the elements of (1) and (2), giving a guide for general requirements for marine operations.

It will be submitted to discussions, and will be modified and enriched throughout the project.

Task 2d) - Sharing testing facilities

The global objective of ESONET task WP2d "Networking / Sharing Facilities" is to organise the sharing of test facilities and technical expertise, in order to improve the long-term operating capability of underwater observatory components and systems.
The global objective of this task was refined to 4 points, in the ESONET DoW:

- constituting a database of testing facilities and equipment
- developing common testing practices
- constituting a core group of institutes and companies sharing best testing practices
- organising a common schedule and methodology for tests.

IFREMER organized a general call to collect information on available test procedures and available facilities and equipment to be shared. IFREMER make them available through a BSCW internet shared space. The list of the core group constituted is included with contact references. See Deliverable D10 prepared by Ifremer for more information.

In a second step a document that gives guidelines to define and implement the plan of tests to be carried out within the frame of sub sea observatory design and construction has been prepared. The test plan refers to the tests to be carried out on shore using dedicated testing facilities, such as laboratory or workshop installations, sensor laboratory calibration benches, testing water basins. (deliverable 36).

Within the framework of WP2d an action to compare the performance of several underwater acoustic modems was initiated. In July 2008 a one-week inter-comparison campaign was carried out in the Mediterranean Sea on Ifremer vessel "Europe".

Task 2e)- Contribution to GEOSS standardization and implementation activities

Within this task the following activities were carried out:

- Creation of an ESONET/GEOSS site on Google Sites http://www.esonet-noe.org/news_and_events/others/2009_03_17_esonet_yellowpages_esonet_forum_for_geoss that collects documents and information relevant to the ESONET community. This site has been made accessible to the public.
- Participation in and presentation given on global ocean acoustic monitoring at the GEO Sensor Web Enablement workshop, 15-16 May 2008 in Geneva. This activity is important to raise ESONET visibility within the group of earth observation institutions and participants.
- Two papers were submitted to present the concepts developed within ESONET. The papers were presented at PASSIVE 08 in Hyères (France) in October 2008
    - New trends for Environmental Monitoring Using Passive Systems, October 14-17, 2008.
      Title: A proposed architecture for marine mammal tracking from globally distributed ocean acoustic observatories, Eric DELORY, dBscale Environmental Sensing, Christoph WALDMANN, University of Bremen/MARUM, Janet FREDERICKS, Woods Hole Oceanographic Institution
- Participation in the GEO workshop "The User and the GEOSS Architecture XXV" - 3-4 December 2008, Valencia, Spain

- Continuous participation in the IEEE activities for GEOSS via teleconferences. Eric Delory appointed co-editor for GEOSS ontologies.

Additionally ESONET partners participated in the GEO European Projects Workshop, 3-4 September 2008, Brussels: presentation of a poster.
The main objective of the workshop was twofold:

- developing collaboration between the projects of the Framework Programme related to Earth Observation activities
- contributing to the design of the GEO 2009-2011 Work Plan from a European perspective.

In commenting the draft report of the meeting, IFREMER pointed out to Tomaz Mardal that deep-sea observation requires specific systems. Specific thematic areas should be included. For example:

- - tsunami generation (slope failure, seismic activity...)
- - gas-hydrate release
- - fluid seepage in slope instability
- - hydrothermal activity
- - marine sediment transport
- – deep-ocean circulation
- - benthic storms
- - ocean acidification
- - benthic and pelagic impact of marine resource exploitation
- regional oxygen minimum zone intensification and hypoxia developments.

The deliverable D35 “Recommendations for ESONET registration in GEOSS was issued.

Task 2f)- Organization of the second Best Practices Workshop at IFREMER
The organization of the second Best Practices workshop is planned in Brest on October 8-9th 2009. First decisions on organisational issues were made. The workshop will build up on the previous workshop where working groups were established to focus on certain topics.

2.2.3 Deviations from the project work programme, and corrective actions taken

No significant deviation this year: deliverables and milestones passed in due time.

2.2.4 Deliverables list

Del. no.	Deliverable name	Work package no.	Date due (proj.month)	Actual/ Forecasted delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
D25	Specifications report for demonstration actions- sensor	WP2	23	25			KDM/UniHB

Del. no.	Deliverable name	Work package no.	Date due (proj.month)	Actual/ Forecasted delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
	interface						
D26	Specifications report for demonstration actions- quality assurance	WP2	23	25			UniABDN
D27	Specifications report for demonstration actions- subsea interventions	WP2	23	25			IFREMER
D35	Recommendations for ESONET registration in GEOSS	WP2	23	25			DBscale
D36	Report of testing facilities survey	WP2	23	25			IFREMER

* if available

2.2.5 Milestones list

Milestone no.	Milestone name	Work package no.	Date due (month)	Actual/Forecasted delivery date	Lead contractor
M2-20	Common test procedures	WP2	20	20	IFREMER
M2-24	Sensor standardisation group: preliminary report	WP2	24	25	UNIHB
M2-24	Quality assurance group: preliminary report	WP2	24	25	UNIABDN
M2-24	Underwater intervention group: preliminary report	WP2	24	25	IFREMER

2.3 WP 3 – Scientific Objectives and Observatory Design

Persons in charge**: Henry Ruhl** (h.ruhl@noc.soton.ac.uk)
Contact: +44 (0) 23 8059 6365
Institution: NERC-NOCS

Names and institutions of the participating persons:

Task	Persons in charge of Task Teams	
WP 3 SCIENTIFIC OBJECTIVES AND OBSERVATORY DESIGN	Henry Ruhl	NERC-NOCS (GB)
3a) Science objectives	H. Ruhl	NOCS
3b) Generic Science modules	Jens Greinert	NIOZ
3c) Specific science modules	L. Géli	IFREMER
Names of other participants (and institutions names): Louis Géli (IFREMER) Yves Auffret (IFREMER) Jens Greinert (NIOZ) Johannes Kartensen (KDM/IFM-GEOMAR)	Olaf Pfannkuche (KDM/IFM-GEOMAR) Ana Colaço (Uaç) Richard Lampitt (NERc-NOCS)	
Other inputs received from: IPGP, CNRS, KDM/ UNIHB, KDM/ MPIMM, KDM/ JUB, INGV, ISMAR , HCMR, FORTH, IMI, UPC, NGI, NERSC, ULB, UGOT, IO-BAS, ITU , DEU-IMST, NKE , UNIABDN		

2.3.1 Work package objectives and starting point of work at beginning of reporting period

Task 3a - Science objectives: Scientific objectives will be updated by a prominent group of expert scientists reporting to the Scientific Council and to the Strategic Committee. The technological specifications of future deep-sea observatories with the scientific objectives.

Task 3b - Generic science modules: The main objective of this task is to ascribe the development of generic technology to the scientific requirements and needs.

Task c - Specific science modules: In addition to the generic science modules, some specific modules are needed for monitoring purposes. These specific systems (e.g. seismic) are evaluated in task c; maturity is being evaluated.

2.3.2 Progress towards objectives – tasks worked on and achievements made

Task 3a) – Science objectives

This activity included researching recent advances in marine research, garnering individual inputs from subject experts with ESONET NoE and elsewhere, as well as investigating science priorities of various organizations from regional to international levels. The update covered the major international science priorities in the four interconnected fields of geoscience, physical oceanography, biogeochemistry, and marine ecology, as well as the practical ways in which these questions can be

addressed using ESONET. Experts in each of the major areas were identified and included representations from NOCS, Universidade dos Açores (UAz), Konsortium Deutsche Meeresforschung, (KDM), and Ifremer.

The outline of the science objectives and basic design requirements presented was based initially on the work of the ESONET Concerted Action (CA) and ESONET Network of Excellence (NoE), as well as the ESONET Network Implementation Model (ESONIM), and European Multidisciplinary Seas Observation (EMSO) preparatory phase programs that have been organizing science requirements, logistical, fiscal, and legal aspects of building and operating a dispersed ocean observing network. Active input was importantly sought during a meeting of the ESONET NoE General Assembly, and a special joint meeting of several major European and international ocean science programs, the Scientific Objectives Workshop held close to the General Assembly in October 2008 (see Deliverable D31 chapter 5, for more information,) to:

1) have representatives from recent and current programs discuss their objectives and, in particular, how they relate to the science objectives of ESONET;
2) present the proposed ESONET science objectives with integrated discussions of the preceding external inputs and;
3) make recommendations and decisions about the scope and detail of ESONET science objectives.

Inputs at the meeting included those from the Hotspot Ecosystem Research on the Margins of European Seas (HERMES), Hotspot Ecosystem Research and Man's Impact on European Seas (HERMIONE), European Network of Excellence for Ocean Ecosystems Analysis (Eur-OCEANS), Global Ocean Observing System (GOOS), the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER), EuroSITES Open Ocean Observatory Network (EuroSITES), CARBOOCEAN, MERSEA, CoralFISH, and Deep-ocean Environmental Long-term Observatory System (DELOS) programs. This meeting resulted in an important consensus on the science objectives that might be addressed by ocean observatories, both directly and with the input of other types of information such as atmospheric, satellite, or other data. Input was also gathered from the Marine Biodiversity and Ecosystem Functioning (MARBEF), Developing Arctic Modelling and Observing Capabilities for Long-term Environmental Studies (DAMOCLES) programs, the US National Science foundation Ocean Observing Initiative (OOI, 2007), Neptune Canada, the Monterey Bay Aquarium Research Institute, and operational oceanography programs such as MyOcean (MyOcean). A web-based survey of the ESONET General Assembly and associated program participants also provided a mechanism for individuals within ESONET to voice their inputs either by name or anonymously. All of these inputs were gathered with oversight from the ESONET Steering Committee and Scientific Council. This activity led to the deliverable 11, which is currently being revised for submission as a peer-reviewed paper. This should provide substantial outreach and garner further inputs on science objectives from the international ocean science community.

Task 3b) – Generic Science modules

The activities in 3b were also an important focus during the 2nd year. NOCS initiated contacts with several partners (including Ifremer, NIOZ, KDM, IMI, & UNIABDN) to

get a provisional generic science module specified so that the specifications could be available to other work packages for data management (WP1), interoperability (WP2) and implementation strategy (WP5) concerns. Guidance for the specifications of the generic science module came from the sources outlined in 3a and importantly recognised the notion that any current specification should only be provisional and could be modified as need be. NOCS coordinated the documentation of the generic specifications primarily with NIOZ and Ifremer. Further details on the generic specifications can be found in *deliverable 13.* It is anticipated that material in deliverable 13 can serve to facilitate greater potential for the demonstration missions to develop instrumentation modules that incorporate the generic module specifications, wherever reasonable.

Task 3c) – Specific science modules

Like activity 3b, 3c has been an important focus for WP3 & NOCS, with substantial assistance by Ifremer, and NIOZ. Although the outlined generic module will be able to address many science areas of ESONET, more specialized systems will be needed for comprehensive research in each science area. NOCS and its collaborators have been investigating and documenting the availability of rather specialised sensors, sensor systems, and platforms. This material is included in deliverable 13. Because there are now many systems being used in deep-sea international research this deliverable will require updates as the performance of existing systems becomes better known and new systems become available. Additionally the amount of documented technical specifications for each of these systems will increase as needed, as well as the ways in which the various systems can come together to form an interdisciplinary observatory. For example, the standalone and cabled scenarios being investigated in WP5 can be given more detail based on knowledge gathered in Deliverable13.

It should be noted that the science objectives and activities of the demonstration missions are not addressed here, but their progress and recommendations are being noted by WP3.

2.3.3 Deviations from the project work programme, and corrective actions taken

There were no major deviations in WP3, although the preliminary work done does need important additions and updates for the full scope of the outlined task goals to be realized. These updates were, however, foreseen and the next major update will be done at or around the time of the next All Regions Workshop in fall 2009. The plan for the next period is to strengthen cooperation with the regional groups on their specific scientific and instrumentation needs.

2.3.4 Deliverables list

Del. no.	Deliverable name	WP no.	Date due	Actual/Forecasted delivery date	Estimated indicative person-months (*)	Used indicative person-months (*)	Lead contractor
D11	Report on scientific background and objectives	WP3	18	18			NOCS
D13	Report on science modules	WP3	24	24			NOCS

* if available

2.3.5 Milestones list

Mil. no.	Milestone name	Work package no.	Date due	Actual/Forecasted delivery date	Lead contractor
M3-18	Scientific objectives	WP3	18	18	NOCS
M3-18	Preliminary report on generic science modules	WP3	18	18	NOCS
M3-24	Preliminary report on specific science modules	WP3	24	24	NOCS

2.4 WP 4 – Demonstration Missions

Persons in charge: Laura Beranzoli , Mathilde Cannat
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Institution: Istituto Nazionale di Geofisica e Vulcanologia, Institut de Physique du Globe Paris

Names and institutions of the participating persons:

Task	Persons in charge of Task Teams	
WP4 DEMONSTRATION MISSIONS		
4a) Call for proposal	Laura Beranzoli Mathilde Cannat	INGV IPGP
4b) Demonstration missions: follow-up and reporting	Laura Beranzoli	INGV
Names of other participants (and institutions names): DOP/UAÇ, FFCUL/CGUL, IPGP, NOC, CNRS , Univ. Bremen, SOPAB, IFREMER, ITU, ISMAR, INGV, DEU/IMST, Marum (KDM), AWI (KDM), IfM Geomar (KDM), UiT, MPI, UPC, INFN , CSIC , dBS, CIBRA, TFH, TEC		

2.4.1 Work package objectives and starting point of work at beginning of reporting period

WP4 work objectives relates to the kick-off and monitoring of the developments of Demonstration Missions (DMs) participated by ESONET partners as well as the collection of the documentation of the DMs in order to facilitate the profitable use of the DMs results for the ESONET NoE objectives.
WP4 activity in the reporting period started with the publication of the selected DMs within the 1st Call.

The reporting period includes both Task 4a and Task 4b.
The objectives to be fulfilled in the reporting period include

- the start-up of the selected DMs by the acquisition of the corresponding implementation plans, according to a pre-defined format, and the signature of the Grant Agreement for each DM which constitutes the formal framework for the development of the Demo Missions,
- the elaboration of the 1st Periodical Report of the selected DMs
- the preparation of the 2nd Call for DMs with Guidelines for Applicants
- the opening of the Call and the collection of the new DM proposals
- the start-up of the evaluation process for the new DM proposals and the selection of new DMs.

2.4.2 Progress towards objectives – tasks worked on and achievements made

The objectives of the reporting period were all fulfilled in the reporting period though with a slightly different timing with respect to what was originally planned.

Task 4a) – Call for proposal

A new text of call for proposals was elaborated in order to launch a 2nd Call for DMs. According to the suggestion of the Chairs, SC members, the European Commission Scientific Officer and on the basis of previous experience, the text of the 1st Call was reviewed and updated with respect to the budget and the Scientific and Technological Areas (SA, TA). The revision of the SA and TA was to favour the ones not dealt with by the selected DM of the 1st Call. The list of external Referees was updated and the contacts started having availability to do the reviewing.

The following timing was envisaged for the 2nd Call.

1. Publication of call	October 28th, 2008
2. Deadline for submission of full proposals	December 10th, 2008
3. Evaluation of proposals' eligibility	December 15th, 2008
4. End of Evaluation process by referees	January, 2009
5. Steering Committee selects the proposals to be funded and communicates to the proponents	January, 2009
6. Elaboration of the Evaluation Summary Reports	February, 2009
7. Letter to applicants	February, 2009
8. Signature of first grant agreements	February, 2009

The steps from 1 to 6 were completed within the planned dates.. During the final selection the Steering Committee selected 3 proposals but with the condition of merging 2 of them. Indeed, a proposal, named MODOO on the Porcupine Abyssal Plane site, was selected in first position without any condition. Then, 2 other proposals, ARCOONE and MASOX were both dealing with the Arctic node. The Steering Committee judged it necessary to merge these two proposals to reach the main ESONET objective: integrating the Community and to avoid fragmentation. This request was officially sent to these 2 DM leaders at the same time with the acceptation letter for MODOO in early February. Nevertheless the signature of the Grant Agreement (step 8 of the table above) could not be solved in due time because the merged Arctic proposal has to be received and checked by the Steering Committee to officially decide the amount of the grant attributed to these 2 nodes. One month delay is foreseen.

Task 4b) – Demonstration missions: follow-up and reporting
1st Call

The DMs approved under the 1st Call are listed in Table 1 together with the coordinator's name, start time, duration in months according to the provided implementation plans.

TABLE 1

Name	Coordinator	Start date	End date	Duration (months)	months with respect to this report
LOOME	MPI-MM Dirk de Beer	01.02.2008	31.12.2010	35	12
MARMARA-DM	IFR Luis Geli	01.04.2008	30.09.2010	30	11
LIDO	UPC Michel Andrè	01.09.2008	31.08.2010	24	6
MOMAR-D	IFR Pierre-Marie Sarradin	01.09.2008	31.08.2010	24	6

The start dates of the DMs are distributed over a large period - from February to September 2008 - because part of the DMs Grant Agreement signature process took longer than foreseen and because some deployments at sea were postponed. The late signatures of the Grant Agreement delayed the budget distribution, which in some cases (companies) was the precondition to start the activities. In some cases these formalities were completed in a few months. During the General Assembly held in September 2008, a meeting was arranged among the WP4 leader and DM coordinators for recommendations and a final check of the implementation plans.

The first periodical report of DMs (Deliverable D12) was issued in November 2008 and relates to the status of the above-listed DMs in the period from the start-date of each DM to 30 September 2008.

A brief update of the status of the DM activities up to this report's final date follows.

LOOME (month 12)

LOOME DM is a networking action for the long-term observation of a major site of methane emission from the deep European margin, the Håkon Mosby mud volcano (HMMV). The HMMV is a cold-seep ecosystem located at a water depth of 1,250 m on the SW Barents Sea slope off Norway, in an area with a history of seabed slides and tsunamis, and under exploitation for hydrocarbon resources and fisheries.

Activities started (WPs)	Status
WP1 – seismic detection of eruptive events: in the submitted Implementation plan this WP was planned starting in month 3 and lasting for 15 months; in the 1st DM Periodic Report the start was anticipated to month 1	In progress

Activities started (WPs)	Status
WP2 - Monitoring of fluid chemistry	In progress
WP3 - Long-term Temperature sensors:	In progress
WP4 - Scanning sonar for gas flares detection:	In progress
WP5 - Design of sensor Network and operation platform	Completed
WP6 - Recovery and Deployment Procedures	Completed
WP7 - Design of underwater communication	In progress
WP8 - Documentation of interoperability and standardisation: although declared as started, the description of the work done is lacking	In progress
WP9 - Cruise Reports Polarstern and Jan Mayen	In progress

MARMARA-DM (month 11)
The goal of MARMARA-DM is to contribute to the establishment of optimized permanent seafloor observatory stations for earthquake monitoring in the Marmara Sea (MS), as part of ESONET NoE.

WP started	Status
WP1 - Analysis of data from Marnaut Cruise	In progress
WP2 - Marine operations	In progress
WP3 - Integration of land and seafloor seismological data	In progress
WP 4 - Data integration and monitoring	Start month 24
WP5 - comparative feasibility studies	Start month 24
WP6 - Public and Education outreach	In progress

LIDO (month 6)
The objective of the proposal will be achieved through the extension of the present capabilities of the observatories working in the ESONET key-sites of Eastern Sicily (NEMO-SN1) and of the Gulf of Cadiz (GEOSTAR configured for NEAREST pilot experiment) by installing yet-unincluded sensor equipments related to Bioacoustics and Geohazards.

WP started	Status
WP1 - Recovery refurbishment and deployment of observatories NEMO-SN1 and GEOSTAR, and refurbishment	In progress
WP2 - Quality and Data Management	Start month 6
WP3 – Public outreach	In progress
WP4 – RT software development	In progress
WP5 –Technical assessment started before the official start date	In progress
WP6 - Management	In progress

MOMAR-D (month 6)
The MoMAR (Monitoring the Mid-Atlantic Ridge) initiative aims at providing a multidisciplinary time-series data set for hydrothermal systems in the Azores region of the Mid-Atlantic Ridge. This coordinated plan aims at determining the feedbacks between volcanism, deformation, seismicity, and hydrothermalism, and to understand how hydrothermal ecosystems couple with these sub-surface processes, and how this affects exchanges with the ocean.

WP started	Status
WP1 – scientific experiments	Start month 20
WP2 – Infrastructure of the observing system	In progress
WP3 – Data Management	In progress
WP4 – Site management	In progress
WP5 – Communication plan	In progress
WP6 - Cruise	In progress
WP7 - Management	In progress

2nd Call
At the time of this report's elaboration the selection of the new DMs has been completed.
DM proposals MASOX and ARCOONE focusing on the ESONET Arctic site and MODOO focusing on the ESONET Porcupine Abyssal site were selected.
MASOX and ARCOONE were requested to merge, as they relate to the same ESONET key area, and a rearrangement into a single proposal is in progress by the respective coordinators.

2.4.3 Deviations from the project work programme, and corrective actions taken

The 2nd Call was issued in month 26 instead of 20: this was due mainly to the time needed to amend the texts from the 1st call after the 1st annual reporting process, with acceptation by both SC members and the European Commission Officer. This was solved before the ESONET general assembly in month 25 (Oct 2008).

A slight delay in the start-up of the DMs selected under the 2nd Call is registered: the start-up was foreseen in month 24 whereas the actual start-up will be by month 26.

The delivery of D12 was a little bit delayed because it was more efficient to present the reporting process specific to the DMs to DM coordinators in a WP4 meeting. This was possible only during the General Assembly in Oct. 2008 (month 30) when all ESONET partners were present. Indeed, a dedicated meeting would have been costly. As a result the periodic reports were done quickly then.

2.4.4 Deliverables list

Del. no.	Deliverable name	WP no.	Date due	Actual/Forecasted delivery date	Estimated indicative person-months (*)	Used indicative person-months (*)	Lead contractor
D12	1st Periodical Report on Demonstration missions	4	18	22			INGV

* if available

2.4.5 Milestones list

Mil. no.	Milestone name	WP no.	Date due	Actual/Forecasted delivery date	Lead contractor
M4-20	2nd Call test Issue	4	20	26	INGV
M4-18	Status report on Demonstration Missions	4	18, 24,30	21, 24,30	INGV

2.5 WP 5 – Implementation Strategies

Persons in charge: **Mick Gillooly** (michael.gillooly@marine.ie) and Fiona Grant (fiona.grant@marine.ie)
Contact: +353 91 387200
Institution: Marine Institute

Names and institutions of the participating persons:

Task	Persons in charge of Task Teams	
WP 5 IMPLEMENTATION STRATEGIES	M. Gillooly Fiona Grant Juanjo Dañobeitia	IMI IMI CSIC
5a) Science, Engineering and business plan for generic sites	Jaume Piera Olaf Pfannkuche Fiona Grant	CSIC IFM-GEOMAR IMI
5b) Legal, Ethical and Environmental (LEE)	Michel Andre Gael Andre	UPC ALTRAN
5c) Comparative work	Jaume Piera Olaf Pfannkuche Fiona Grant	CSIC IFM-GEOMAR IMI
5d) Reporting to EMSO and mobilising the NoE on long-term strategy funding plan	Roland Person Jean-François Rolin Paolo Favali	Ifremer INGV
Names of other participants (and institutions names):		
Jean-François Rolin (IFREMER) Edi Bauerfeind (AWI) Norman Lochthofen (AWI) Nick O'Neill (CSA) Ana Colaço (Uaç) Pier Luigi Franceschini (INGV) Mathilde Cannat (IPGP)	Jean-Jacques Destelle (CNRS) Jérôme Blandin (IFREMER) Yves Auffret (IFREMER) Jean-François Drogou (IFREMER) Henry Ruhl (NOCS) Louis Geli (IFREMER) Jean-François Masset (IFREMER)	

2.5.1 Work package objectives and starting point of work at beginning of reporting period

Objectives: WP5 addresses the most sensitive questions in the project. Business models, legal and permitting methods and reply to proposals are considered to be part of the common activities and will be shared according to rules included in the Consortium Agreement. The economic, legal, technological and environmental impact aspects of implementation are addressed. WP 5 will focus on creating structural linkages and strategies to enable establishment of significant Seas Observatory Network(s) in the areas prioritized through ESONET, or via evolving drivers such as GMES, GEOSS, seismological operational networks, ICG/NEAMTNS and the European Marine Strategy, etc. The NoE will also forge links with the owners

and operators of existing structures, such as MARS, NEPTUNE and ARENA and assess the source of the experienced delays.

2.5.2 Progress towards objectives – tasks worked on and achievements made

Task 5a) - Science, Engineering and business plan for generic sites

Task 5a	Generic Cable Site WG Jaume Piera	Standalone Site WG Olaf Pfannkuche
Science	Activity 5a1: Update Scientific Report on Network Functions and Customers from ESONIM project. The objective is to update the over-arching specifications of user needs and update the justification for the establishment of a European Seafloor Observatory Network.	Activity 5a2: Develop Scientific Report on Network Functions and Customers using the ESONIM template as appropriate. The objective is to provide the over-arching specifications of user needs and scientific justification for the establishment of a standalone site.
Engineering	Activity 5a3: Update Engineering Report on Observatory Architecture Manual from ESONIM project. The objective is to review the outputs from the ESONIM model, update the technical specifications of the observatory components as appropriate for a generic cabled observatory and to provide updated cost estimates which can be used in the Financial task.	Activity 5a4: Develop Engineering Report on the technical architecture of a Standalone Site. The objective is to develop an engineering solution for the design, development, construction and deployment of a standalone system that will deliver the best technical solution and to provide cost estimates, which can be used in the Financial task.
Business Plan & Financial Model	Activity 5a5: Update Business Model and cash flow forecast from ESONIM project. The objective is to review the business plan and financial model from ESONIM and produce an overall estimate with uncertainties and identify more difficult items where specific work is needed within EMSO.	Activity 5a6: Develop Business Model and cash flow forecast using the ESONIM financial model as a template. The objective is to develop a business plan and financial model for a standalone observatory and produce an overall estimate with uncertainties.

Following a meeting held in Barcelona in March 2008, two WGs were set up to develop science, engineering and business plans for a Generic Cable and Standalone Site. These WGs were led by Jaume Piera (CSIC) and Olaf Pfannkuche (IFM-Geomar).

One of the main difficulties in engaging partners to work on tasks was centred on a delay in getting funds to be attributed to partners. Although a fund request for WP5 was submitted in June 2008 to the coordinator, it was not until after the Faro meeting

in October 2008 that the budget request was approved and funds distributed to partners. The delay in fund distribution was due to the fact that some WPs requests were not submitted before this date and because of the delay in the 1st yearly reporting process..

Following this, the standalone WG in particular began work in earnest and made significant progress in advancing the science, engineering and financial estimates for a standalone site. The Generic Cable WG was slower to deliver updated engineering and financial estimates (provided very close to the month 24 deadline), which impacted on the IMI's ability to provide detailed business plans for month 24. Fiona Grant has assumed a hands-on role for the delivery of the Generic Cable WG and has been liaising extensively with partners to get through the work schedule and to provide the material essential for the updated business plans.

Despite some delays, important progress was made by partners in relation to each of the science, engineering and business plans. The research and updates undertaken as part of the D5 report provide a solid foundation for the additional work scheduled to take place between months 24-30. The Generic Cable and Standalone site solutions will be compared in detail before final implementation plans are prepared by month 30.

During the course of year 2, three important meetings were organised under the auspices of WP5. The first was a workshop hosted by CSIC in March 2008. Another was held over the course of the Faro General Assembly and the final workshop was dedicated to engineering issues - this was held in Paris in January 2009.

Financial estimates for each of the ESONET sites were prepared using the ESONIM model and the presentation of these highlighted the need for urgent updates of the cost model. The original ESONIM model was developed based on a cabled observatory solution with 1,500 km of cable - but the engineering required for an observatory of this scale is not appropriate for all sites, particularly ones which may be at a much closer distance to shore and which are not in the same water depths. The updating engineering and financial estimates work was undertaken by CSIC in conjunction with our Ifremer colleagues in Brest. These important updates to the financial cost model will now be used to do a detailed assessment of the network over the coming 6 months.

Ifremer colleagues tasked with developing plans for at-sea interventions provided updates for the operation and maintenance plans for deep-sea observatories. These are being linked to initiatives such as EurOcean shared infrastructures and EuroFLEETS.

In order to advance Implementation Strategies for ESONET NoE, WP5 leaders, M. Gillooly and F. Grant, have been liaising extensively at national and European level to keep abreast of initiatives which may facilitate the construction of research infrastructures on the ESFRI Roadmap. The IMI have been actively lobbying Irish funding agencies for the inclusion of ESONET and EMSO in the Irish national roadmap of research infrastructures. The IMI provided updates in relation to potential funding mechanisms and is evaluating the proposed legal framework, currently under negotiation by Commission officials and Member States. Other networking is taking place on a national level with GMES officials and also cross-fertilisation of activities and ideas between ESONET and Euro-Argo was possible due to IMI's involvement in legal, financial and governance work packages for that project. A review of all

ESONET sites and maturity of planning and engagement by local stakeholders and Member States is in an early stage of preparation. Further details are available in D5.

A more detailed review of all elements and tasks undertaken by WP5 participants can be reviewed in D5 - First elements of Implementation Plans.

Task 5b) – Legal, Ethical and Environmental (LEE)

Task 5b	Generic Cable Site WG Michel André	Standalone Site WG Michel André
Legal, Ethical & Environmental	Assemble synthesis of relevant legal and best practice documents (International, EU, national, local) Provide a homogeneous atlas describing the ESONET sites on all parameters needed for environmental assessment and permits. Michel André (see ESONET NoE DoW - §11 – Ethical issues) is to develop a terms of reference/working plan incorporating mammal and environmental components and circulate it to attendees of this meeting over the next few weeks for agreement. All partners will input material relevant to national legal requirements and update legal practices relevant to ongoing programmes (e.g. Antares, Nemo etc). In relation to mammals, impacted species will be identified for each site, recommendation frequency and levels will be defined and a monitoring system to assess the impact on cetaceans at each site will be devised. A 3D model could be developed to assess the acoustic signature of the observatories, to measure ambient noise and to assess the sound propagation of activities from anthropogenic sources such as fishing.	

This task was led by Michel Andre (UPC), with minor inputs from F. Grant (MI). G. Andre and colleagues in Altran worked with M. Andre to identify relevant legislation (through the issuing of the WP1 questionnaire). The primary deliverable of this task is an online database for LEE legislation across Europe. The database is almost fully complete and is available for review on the BSCW – some minor technical issues arose in relation to the final stage of getting the database online. This is now scheduled for the end of Month 25.

Task 5c) – Comparative work

This work is scheduled for months 24-30.

Task 5d) – Reporting to EMSO and mobilising the NoE on long-term strategy funding plan

Tasks relating to mobilising the NoE on a long-term strategy funding plan are being led by Ifremer (R. Person, J.F. Rolin) with significant input from the IMI (M. Gillooly, F. Grant) and INGV (Paolo Favali). Further details are available in D24-2009.

In June 2008, M. Gillooly and F. Grant prepared an initial report to EMSO on the Implementation Model being developed in WP5. Given that the projects will run concurrently, it is important that the scope of the work in each project does not overlap and that the deliverables contribute to the overall development of both bodies

of work. The report concluded that there was no overlap in the work being undertaken by ESONET NoE and EMSO in relation to legal and business planning. WP5 leaders recommended that careful consideration be given to resource allocation and prioritisation of site selection prior to detailed legal and business models being developed.
In January 2009, a formal meeting took place between WP5 leader (M. Gillooly), and the ESONET NoE and EMSO coordinators (related milestone). ESONET SC members also attended the meeting. M. Gillooly presented a first draft of an assessment made by WP5 of ESONET in relation to the maturity of site planning. The assessment was based on high-level (subjective) consideration by M. Gillooly and F. Grant and intended to provoke the consideration of the best approach by SC and co-ordinators. More detail can be found in D5.
The IMI are currently in the process (with the ESONET NoE and EMSO PP co-ordinators and SCs) of developing a proposed implementation plan and we expect to provide more information in this regard in the coming months.

2.5.3 Deviations from the project work programme, and corrective actions taken

Despite some delays in getting work started and progressed on the science, engineering and business plans, there were no significant deviations from the project work programme. Detailed costs from the Generic Cable WG were not received in sufficient time (very close to month 24 deadline) by the WP5 leaders to allow their detailed inclusion within the business planning documentation.
This work will now be incorporated within the comparative work and preparation of the final implementation plans (D48) scheduled for Month 30.

2.5.4 Deliverables list

Del. no.	Deliverable name	WP no.	Date due	Actual/ Forecasted delivery date	Estimated indicative person-months (*)	Used indicative person-months (*)	Lead contractor
D5	First elements of individual implementation plans for specific cabled observatory sites	WP5	24	24	22	18.75	IMI
D20	Report on long-term planned research and cooperation between research organisations	WP5	24	24	2	1	IFREMER
D21	Report outlining agreement on cooperation between organizations involved in developing technology	WP5	24	24	2	1	IMI
D22	Report on confidential meetings between commercial companies and ESONET WP	WP5	24	24	2	1	IFREMER

Del. no.	Deliverable name	WP no.	Date due	Actual/ Forecasted delivery date	Estimated indicative person-months (*)	Used indicative person-months (*)	Lead contractor
	leaders						
D23	Report of meeting to discuss long-term funding for seafloor observatories involving representatives from funding agencies	WP5	24	24	2	1	IFREMER
D24	Report on integration between respective teams and working relationships beyond the life of ESONET	WP5	24	24	7	2	IFREMER

* if available

2.5.5 Milestones list

Mil. no.	Milestone name	Work package no.	Date due	Actual/Forecasted delivery date	Lead contractor
M5-18	Meeting with EMSO on implementation model	WP5	18	23	IMI
M5-24	Meeting on relations with funding agencies	WP5	24	20	IFREMER EMSO STRAC Faro GA
M5-24	Meeting on ESONET core services	WP5	24	30	IFREMER WP6 report delayed

2.6 WP 6 – Socio-Economic Users

Persons in charge: **Juan Miguel Miranda** (jmiranda@fc.ul.pt)
Contact: + 351 217 500 809
Institution: Fundacao da Faculdade de Ciencias da Universidade de Lisboa

Names and institutions of the participating persons:

Task	**Persons in charge of Task Teams**	
WP 6 SOCIO ECONOMIC USERS	Juan Miguel Miranda	FFCUL
6a) Core services stakeholders	Nick O'Neil Monty Priede	SLR Consulting UNIABDN
6b) Regional services stakeholders	Jean-François Rolin	IFREMER
6c) Promotion and SME policy	Jean-François Rolin Olaf Sveggen Ivo Bernardo	IFREMER FUGRO FFCUL
6d) ESONEWS	Juan Miguel Miranda Berlarmino Barata and others	FFCUL FFCUL
Names of other participants (and institutions names): Olaf Godoe (Institute of Marine Research) INGV, NIOZ, UGOT		

2.6.1 Work package objectives and starting point of work at beginning of reporting period

The objectives of this work package are (a) the promotion of the need for subsea observatories, disseminating the results of ESONET NoE and (b) the establishment of permanent links to socio-economic users. These objectives require the development of stronger links between the present and future stakeholders of ESONET, the dissemination of the state of the art of the network to the general public and the promotion of the harmonious development of the different regional infrastructures vis-à-vis the different user communities, with an emphasis on the connection between ESONET and the private sector and searching beyond the marine sector for new partnerships.

For this reporting period, main targets were:

- the stabilization of the core services definition,
- the development of the cooperation with the private sector, in particular of the Esonet Yellow Pages and

the preparation of new issues of Esonews newsletter."

2.6.2 Progress towards objectives – tasks worked on and achievements made

Task 6a) - Core services stakeholders

- Meeting with Oil industry

A Meeting with the oil industry was held in Brussels on November 26th. The meeting took place in the European Commission building and was hosted by P. Legrand and E. CARQUEIJEIRO (EC) who hosted the meeting discussion too. The scope was to identify common areas of interests (geographical, scientific or technical domains) and to specify them roughly in a first step. Twenty-six participants attended the meeting, including representatives of the EC, ESONET NoE and EMSO PP, Shell, BP and Total, and several ESONET partners, including the coordination team.

A major topic that was addressed concerns the requirements for strategic environmental assessments related to oil exploration in deep sea. The requirements for environmental impact assessments and the obligations relating to marine protected areas were also reviewed. Interviews with State agencies and oil companies established the current environmental protection and conservation duties of commercial activities in the ocean and State responsibilities. This approach established both the minimum core services and the stakeholders who will require these core services. Research on the implications of decommissioning was carried out and a report on the liabilities and indemnities was produced.
This meeting was reported in the WP5 deliverable D22 as it is part of confidential meetings.

- *Relation with GMES*

The link between ESONET and MyOcean Marine core services of GMES was attempted as P. Bahurel was invited to join the ESONET General assembly meeting held in Faro, but unfortunately he was not available. Work was done mainly by electronic means and most of its results are incorporated in the Core Services Report. In order to better manage the link with GMES in a general way, the coordination team wrote a support document that will be presented to the targeted component of core services: MyOcean project for the Marine core service and PREVIEW project for the Emergency Response Core Service. It will help to better explain what can be the contribution of ESONET to the GMES and should support upcoming discussions. This document will be updated throughout the project duration according to the upcoming conclusions and actions. It is included in Deliverable D16

Task 6b) – Regional services stakeholders

The organization of the regional services stakeholders was mainly conducted by WP5. Some of the partners (e.g. INGV) made progress concerning the existing sites (NEMO-SN1). Contacts were made with prospective partners or suppliers in Sweden (AMLAB, Swedish Meteorological and Hydrological Institute), Norway (Aanderaa Data Instruments), UK (GURALP), etc...

Task 6c) – Promotion and SME policy

- Cooperation with Industrial Partners

ESONET and PESOS representative (SEND) organized a meeting in London during OI08 on March 11th, with ESONET industrial partners and other companies interested in Esonet. Several attendants from the network were present. Cooperation with the industry was further discussed within the framework of the MODOO project to find synergies and technical solutions for the long-term monitoring of optical properties (turbidity) and conductivity cells. This discussion resulted in the agreement that a state-of-the-art multi-sensor probe (an advanced Generic Sensor Module) could be used for free during the Demo-Missions.

Exchange of information and experience between private companies and the ESONET community took place during the meetings in Algarve. Important actions were developed by the private sector (FUGRO) towards major Norwegian universities, institutes, technology companies and Statoil-Hydro to plan and develop underwater observatories to be located in Norwegian waters. All essential technical and non-technical aspects related to the development and establishment of underwater observatories, with the oil and gas industry as a reference, are being addressed in this process. The costs incurred for this work were fully absorbed by Fugro OCEANOR. Nke participated in the London workshop (March 2008) and in the Faro workshop, where the possibility of making common offers among PESOS partners was analysed.

- *ESONET Yellow Pages*

A first prototype and the layout design of ESONET Yellow Pages were finished. Data is being loaded and tuning of the database structure is underway.
This is reported in the deliverable D17.

Task 6d) – ESONEWS

The design and production of ESONEWS, the newsletter of the European Sea Observatory Network, were developed and constantly improved. Three issues of ESONEWS (Summer, Fall and Winter 2008) gathered contributions from the different partners and SMEs. Paper versions were prepared and disseminated among partners by mail. All ESONEWS Newsletters intended to spread basic information on ESONET initiatives and basic aspects of technology and science associated with deep seafloor observation. Some of the core partners (IFREMER, INGV, Aberdeen) prepared documentation to be included in the different issues of Esonews. Report on ESONEWS is the main topic of Deliverable D15.

2.6.3 Deviations from the project work programme, and corrective actions taken

Concerning ESONET Core Services, the basic specifications which are included in the "Core Services Report" were defined recently. Interaction with the ongoing main Earth Monitoring initiatives is still below expectations and must be reinforced in the forthcoming months.

Cooperation with the industry is in progress and the participation of PESOS inside the ESONET network has been a reality. However, we need to gather more private

partners, not only as suppliers but also as partners for value-added services. Demo missions will probably help in this sense.

The Yellow Pages are not completed as foreseen; input from private companies is still missing in great part. As a correction action we decided to organise a PESOS meeting in Bremen during the IEEE OCEANS'09 meeting (May 2009), to present the ESONET yellow pages, get feedback and input.

2.6.4 Deliverables list

Del. no.	Deliverable name	Work package no.	Date due (proj.month)	Actual/Forecasted delivery date	Estimated indicative person-months	Used indicative person-months	Lead contractor
D15	ESONET News "ESONET News-Europeans observe the deep sea"	WP6	14	14	2	2	FFCUL
D15	ESONET News "ESONET News-Europeans observe the deep sea"	WP6	17	17	2	2	FFCUL
D15	ESONET News "ESONET News-Europeans observe the deep sea"	WP6	20	20	2	2	FFCUL
D15	ESONET News "ESONET News-Europeans observe the deep sea"	WP6	23	23	2	2	FFCUL
D16	Report on core service stakeholders	WP6	18	24	6	6	CSA
D17	Report on promotion and SME policy	WP6	18	24	-	-	IFREMER

2.6.5 Milestones list

Milestone no.	Milestone name	Work package no.	Date due (month)	Actual/Forecasted delivery date	Lead contractor
M6-14	ESONEWS	WP6	14	20	FFCUL
M6-17	ESONEWS	WP6	17	21	FFCUL
M6-20	ESONEWS	WP6	20	22	FFCUL
M6-23	ESONEWS	WP6	23	24	FFCUL
M6-24	Meeting with the stakeholders of the core services	WP6	24	24	CSA
M6-24	SME yellow pages	WP6	24	24	FFCUL

2.7 WP 7 – Education and Outreach

Persons in charge: **Prof. Laurenz Thomsen** (l.thomsen@jacobs-university.de)
Contact: +49 (0) 421 200 3254
Institution: Jacobs University Bremen

Names and institutions of the participating persons:

Task	Persons in charge of Task Team	
WP 7 EDUCATION AND OUTREACH	Laurenz Thomsen	JUB
7a) Educational Tools		
7b) Web portal with real-time web interface		
7c) Communication of results		
Names of other participants (and institutions names):		
IFREMER	Uaç	
CNRS	CSIC	
SOPAB	UPC	
KDM	UGOT	
NERC-NOCS	MISU-SU	
HCMR	ITU	
NIOZ	ALTRAN	
IMI	UNIABDN	

2.7.1 Work package objectives and starting point of work at beginning of reporting period

The main objective of the outreach and training is the development and support of comprehensive interdisciplinary programs for research, education and public outreach and the strengthening of educational possibilities for students of all ages. ESONET´s envisioned internet technologies will merge research portfolios and establish a shared and mutually accessible research resource. Joint public relations can provide a wide range of new opportunities to explore and investigate the dynamics of the marine world using real-time data flows in classrooms and live rooms coupled with cutting-edge visualization techniques. Additionally the training of graduates and postgraduates in multidisciplinary environmental sciences was an important part of ESONET.

2.7.2 Progress towards objectives – tasks worked on and achievements made

Task 7a) - Educational Tools

- **Educational web pages:**

KDM/JUB proceeded with the translation of outreach pages into 14 EU languages, including the recent ESONET brochure. The system is online and embedded into the ESONET Education pages. http://mars-srv.oceanlab.iu-bremen.de/ (Deliverable D18). See figure 7.1
Different outreach and training activities are offered: http://mars-srv.oceanlab.iu-bremen.de/eduandoutreach.html. For example quizzes are offered: http://mars-srv.oceanlab.iu-bremen.de/quiz.html (Deliverable D38).
ESONET School materials are offered: http://mars-srv.oceanlab.iu-bremen.de/schoolmaterials.html.
IMI supplied some material relating to the Celtnet Observatory by F. Grant to A. Purser in JUB for the Education and Outreach website. A link from the IMI website to the ESONET Education and Outreach website was also made.
ITU constructed a website (www.esonet.marmara-dm.itu.edu.tr) for the Sea of Marmara node and the Marmara-DM project.

Figure 7.1

- **Outreach from Aquaria**

The ESONET-NoE public outreach network consists of 3 aquaria (Lisbon, Brest, Heraklion) that will inform and educate the public with regard to ESONET-NoE goals and scientific and technological achievements. Already students from institutions participating in the ESONET-NoE are taking advantage of the links developed and exchanges are underway.

HCMR member Prof A. Tselepides (Un.Pireaus), in collaboration with the Cretaquarium, is in charge of arranging a public ESONET outreach standpoint. The necessary hardware and equipment have already been purchased and very soon the relevant camera and network systems will be installed.
SOPAB installed a webcam in an aquarium of Océanopolis: http://axis-7557fa.axiscam.net:9000/ (deliverable D30)
.Uaç established contacts with Oceanarium in Lisbon in order to have a temporary exhibition about observatories, but there is a need for a loss-leader in order to make it attractive to the general public and kids. A didactic kit/game is being developed.

- Training initiatives:

CSIC/UPC submitted an initiative for training students on the future use of seafloor observatories within the framework of the Marie Curie Network Call (PEOPLE), proposal “TOTEM”. The proposal was supported by several ESONET members. It will be resubmitted with moderate revisions. CSIC also carried out several lectures on deep-sea biology and physics and was in charge of an ESONET tuned summer school (www.geo-prose.com/cabled_wksp/pdfs/turbulence_wg_rpt.pdf). UGOT made its ROVs available and prepared a KOSTOBS outreach activity..

Task 7b) – Web portal with real-time web interface

CPPM worked on the definition of preliminary specifications for access to the Oceanographic data of ANTARES and to this end they had a fruitful visit to Bordeaux to discuss with a team, which has already developed a similar web-based interface (SOMLIT) for oceanographic data from coastal environments. They have begun the development of a database and corresponding web-based interface allowing for the visualization of the data graphically in PHP. A first prototype was previously validated and the safety aspect of the internal pages processed.

KDM/JUB finished the design of a new web portal for school-age users. It will allow grade 8-13 pupils to get an introduction to ESONET research. The web-portal is online. Most pages have animations, showing ocean changes. Further modules will be developed, dealing with ESONET-related science. Examples are given in the following figures (see figures 7.2 and 7.3).

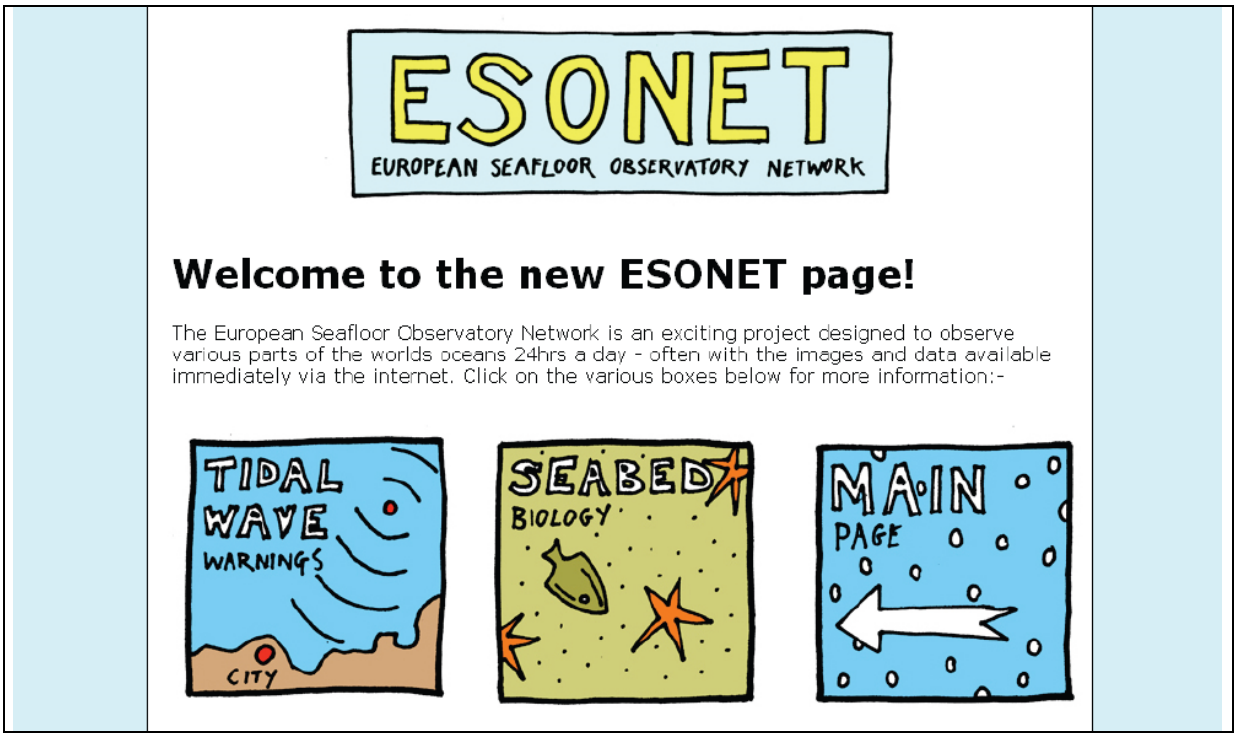

ESONET
EUROPEAN SEAFLOOR OBSERVATORY NETWORK
Welcome to the new ESONET page!
The European Seafloor Observatory Network is an exciting project designed to observe various parts of the worlds oceans 24hrs a day - often with the images and data available immediately via the internet. Click on the various boxes below for more information:-
TIDAL WAVE WARNINGS
CITY
SEABED BIOLOGY
MAIN PAGE

Figure 7.2

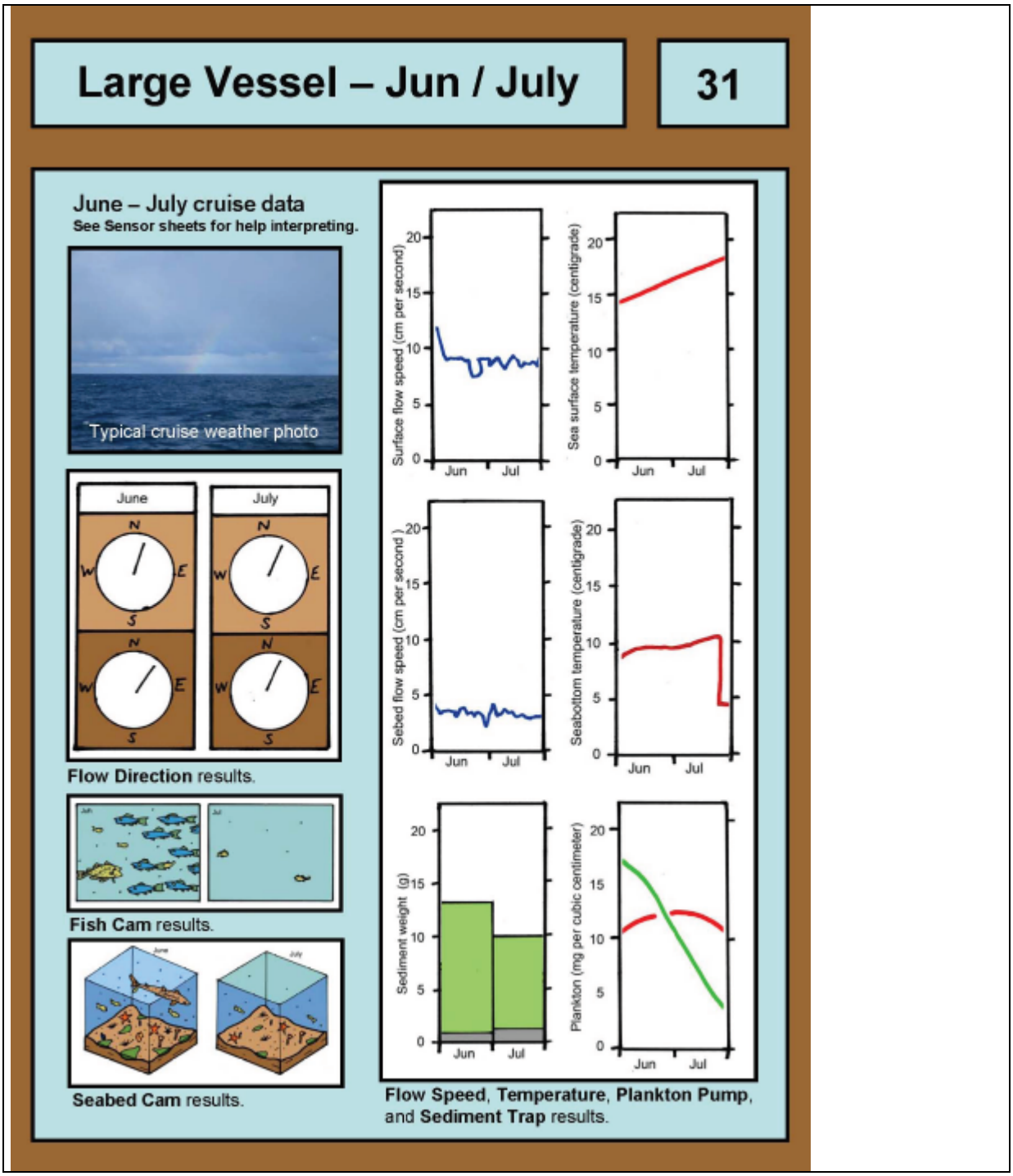


Figure 7.3

The production of school material was achieved. An extensive teaching aid was developed in conjunction with teachers from a UK school. The teaching aid consists of a group game, where the players have to plan a year of ocean observations. The aid is specifically designed to promote ESONET ideas and long-term data collection. The teaching aid will be downloadable, bundled with ESONET information. The age target for this initial aid is 10-14 year-olds. The game is based on the use of 50 A4 cards, some examples are now shown.

UAç installed a KDM/JUB webcam on the deep-sea hydrothermal vent of the mussel aquaria. Some problems need to be solved to access the camera from outside the University because of the firewall. Mussels are maintained since May 2007 by a team of technicians.

UPC carried out public outreach within the framework of the LIDO demonstration mission: Real-time transmission of marine mammal acoustic signals and acoustic images from the seafloor cabled observatory to public institutions (e.g., Scientific Museums, Aquaria) where the whole ESONET network will be presented together with the "sonic imagery" of the LIDO stations. The LAB-UPC developed a website where the visitors, in real time, can listen to the acoustic sources flowing through the Sicily Antenna, follow this statistical analysis and track the different sources. This site will be put online over the next weeks. The same site will host the tracking of the acoustic sources coming from other ESONET and non-ESONET observatories. The website will be found at www.lab.upc.es/lido in the coming weeks. IFREMER made a new version of the main web portal and website with the collaboration of ALTRAN (this is both in WP8 and WP7) still accessed by www.esonet-emso.org.

Task 7c) – Communication of results

IFREMER prepared a 6-page fact sheet to be distributed in workshops and conferences. 1,000 copies are available. A poster is also available on the ESONET website.

CEREGE issued joint press releases by CNRS/INSU and Ifremer following the Marnaut cruise (Marmara sea node) and the publication of a letter in EPSL. In April-May 2008, they participated in an outreach event organized within a regional framework (Marseille, Gap) called "*Printemps des chercheurs*", which consisted of one conference and 4 workshops dedicated to the general public and high-school students. The work performed during the Marnaut cruise in relation to geohazard monitoring objectives was the subject of articles in the French, German and International editions of GEO. Press articles in *La Provence*, and *L'Humanité Dimanche* followed the EPSL publication.

The CNRS IUEM installed the multimedia system provided by the "Jacobs University Bremen" in Océanopolis: JUB translated the quiz in French as well as a poster for the presentation of the programme. KDM/JUB sent aquarium terminals to the Brest and Heraklion aquaria, including translated posters with introductions to ESONET. The systems will soon be online. NOCS has actively sought to more broadly communicate the importance of ESONET NoE activities and of developing observatories. This included attending national, European, and international meetings to disseminate information on observatory efforts through talks, posters, white papers, and peer-reviewed literature.

Technological activities in the Pylos site (Poseidon buoy-wave monitoring etc) were presented in the annual conference of the International Society of Polar Engineers (5-12 July 2008) by HCMR marine engineer Dr. T. Soukisian.

NIOZ promoted the results of ESONET for an international audience; an International workshop aiming to increase cooperation for long-term monitoring of methane release in the Arctic was also put under the "ESONET Umbrella" (see

www.nioz.nl/arctic; 18 to 20 February 2009 at NIOZ, The Netherlands). Several ESONET partners participated in this workshop and presented results from Demo-Missions (e.g. LOOME and MARMARA). The workshop was organized by Jens Greinert as leading coordinator in cooperation with Dr. Rick Coffin from the Naval Research Laboratory (USA) and Prof. Tina Treude from IFM-GEOMAR (Germany). It was financially supported by NETL (Department of Energy, USA), Excellence Cluster "Future Ocean" (Kiel, Germany) and ESONET (The Netherlands). UGOT actively supported the KOSTOBS locality in Sweden as a site for public outreach, educational activities as well as tests.

2.7.3 Deviations from the project work programme, and corrective actions taken

Deviation on deliverable D32: The Demo-Missions have to go online before the full web portal can be opened. The same holds true for the introduction to the demo-missions.

2.7.4 Deliverables list

Remark: deliverables of WP7 are not classified as reported in the DOW, but as "o" other, which is suitable to deliver a website, quiz, games and posters.

Del. no.	Deliverable name	WP no.	Date due	Actual/Forecasted delivery date	Estimated indicative person-months (*)	Used indicative person-months (*)	Lead contractor
D18	Publishing of draft ESONET web portal	WP7	20	26	12	6	KDM
D30	Installation of computer terminals	WP7	20	26	1.5	2	KDM
D32	Introduction of demo Missions	WP7	22	26	2	4	KDM
D38	Finish of games and quiz section	WP7	24	24	3.5		KDM

* if available

2.7.5 Milestones list

Mil. no.	Milestone name	WP no.	Date due	Actual/Forecasted delivery date	Lead contractor
M7-22	Web-portal open: better insight into current ESONET activities	WP7	22	28	KDM

2.8 WP 8 – Management Activities

Persons in charge: **Roland PERSON**
Contact: roland.person@ifremer.fr
Institution: IFREMER

Names and institutions of the participating persons:

Task	Persons in charge of Task Teams	
WP 8 Management activities	R. PERSON I. PUILLAT	IFREMER IFREMER
	Partner members:	Steering Committee

2.8.1 Work package objectives and starting point of work at beginning of reporting period

This work package is in charge of all the management activities of the ESONET network, which comprises 3 Governing Bodies (the General Assembly (GA), the Strategic Committee (STRAC) and the Steering Committee (SC)), 3 Advisory Councils (the Scientific Council, the Test and Operation Council and the Data Management Council), as well as 7 Work packages (WPs) of activities (8th WP is dedicated to ESONET Coordination).
The Coordinators make sure that the organizational, management and governance structure of ESONET NoE aims at ensuring:

- balanced participation in the network of the different types of members: large institutions, university laboratories, major industrial groups, SMEs.
- efficient decision-making
- high-quality management of the network's resources

One of the main objectives of WP8 is also to coordinate the integration of the community on different topics and across different WP activities. Some tasks like the reporting and follow-up of the link with the European Commission and other EU projects are a fundamental part of the WP8 tasks.
The ESONET network is composed of 55 partners, which makes the ESONET coordination's project relatively complex. This is why we decided to provide methods and procedures for the management of ESONET. Indeed, for this reporting period one of the main objectives was the setting-up of online reporting systems and training sessions. We also improved the financial management at WP level.
Two other fundamental objectives were to prepare a first definition of the ESONET Label, the organization of the 2nd General Assembly in addition to usual meetings (Steering Committee…).

2.8.2 Progress towards objectives – tasks worked on and achievements made

Task WP 8a) - General Assembly
After 18 months, the second General Assembly (GA) meeting of ESONET was held at the Universidade do Algarve in Faro, Portugal, on 22nd-23rd October 2008. This

meeting was an opportunity to bring together most of ESONET participants for other ESONET Workshops. This meeting rounded 76 participants from 38 institutions.
Other meetings were annexed: 7 WP meetings, 3 council meetings, Strategic committee Meeting (jointly with EMSO PP), EMSO PP meeting, and Scientific Objectives Workshop managed by WP3.
During these meetings, some key activities like the Demonstration Missions, the Standardization, the Integration by site, with the diffusion of an ESONET questionnaire concerning available data sets from ESONET observatories (see: http://wwz.ifremer.fr/esonet_emso) and the definition of scientific objectives showed that the ESONET community proceeded with an important step towards integration, as a result of an increased synergy (See Deliverable D31).

IFREMER worked towards the preparation of the General Assembly meeting and associated meetings (7 WP meetings + 3 council meetings, SC meeting, STRAC meeting, EMSO PP meeting, Scientific objectives workshop):

- Online registration system provided for all meetings
- Agenda preparation for all meetings
- Slide template provided for General Assembly presentations
- Documents preparation for each meeting and circulation in the suitable groups and consolidation in books distributed during meetings as support for discussions and presentations
- Presentation of WP8 management activities
- Presentation of financial results
- Votes organization

The on-site organization was led by Lisbon University, FFCUL with the help of Algarve University, ULG.
IFREMER also managed the reporting of the General Assembly meetings and annexed meetings in Deliverable D31.

Task WP 8b) - Meeting organization

As the coordinator, IFREMER manages the meetings' agendas and invitations, the reporting of the meetings and their approval.
Six Steering Committee meetings were co-organised, amongst them two virtual ones. The second Strategic Committee was held in Faro, on the same day as the General Assembly. The first Council Meetings (Data Management Council, Test and Operation Council and Scientific Council) were also organized in Faro (See Deliverable D31).
A meeting with oil industry representatives was also co-organized, with the European Commission, in Brussels on 26 November 2008 (See Deliverable D22).
To optimise the yearly ESONET reporting, 2 training workshops were organized to give information on the new ESONET reporting website and on reporting processes generally speaking.

NOCS led the organization of the Science Objectives Workshop in Faro with logistical assistance from Ifremer. NOCS also agreed to help coordinate the next spring meeting of the steering committee.

All the information concerning the ESONET meetings and workshops is available on the ESONET website:
http://www.esonet-noe.org/news_and_events/esonet_workshops_and_meetings

Task WP 8c) - Information management and yearly reporting

This WP is in charge of the yearly reporting activities for the European Commission. Due to the number of partners involved, the ESONET yearly reporting was one month anticipated and began on 1st February 2009. Indeed, it is impossible to manage the information flow from 55 partners in 45 days as it is usually the case in European projects. In addition, partners are not used to Network of Excellence specificities, which leads to many questions on financial issues and wrong financial statements at the last minute. We concluded that the 45 days should be used for financial reporting only and we anticipated the activities report of partners and WP leaders one month before. We also decided to set up an online reporting tool. This was clearly explained during the General Assembly meeting in Faro and reminded by Email several times.

Reporting schedule

In order to schedule the reporting well, we divided the process in four reporting steps.

- Phase 1 began on 1st February 2009 and was closed on 15th February; it was dedicated to reporting the activities of each ESONET partner per WP, without any financial statement. At this stage the estimated man-months spent on each WP were requested in order to inform WP leaders about the activities claimed by Partners. Partners were also requested to inform them about the intended activities for the next 18 months for each WP.
- The second Phase started on 15th February 2009 and should have been closed on 28th February 2009; it was dedicated to reporting the activities of each Work package during the reporting period. In order to help WP leaders, the Coordination Team sent information consolidated by WPs from Phase 1 to each WP leader.
- Phase 3 started on 15th February 2009 and should have been closed on 28th February 2009; it was dedicated to making a programme of activities of each Work package for the next 18 months starting from 1st March 2009. Phases 2 and 3 can be completed only by the WP leaders.
- Phase 4 started on 1st March 2009 and should have closed on 21st March 2009; it was dedicated to the financial statements of each partner including draft Forms C.

The online reporting tool:

The online reporting tool is available on internet at:
http://www.ifremer.fr/application/reporting/esonet (see figure 8.1)
It works with the content manager JOOMLA and is hosted on an IFREMER server. Each partner has a username and password allowing to edit and modify files of which the latter is the author. All contents reported are readable by all Esonet partners after login. We added a FAQ section and a Reference Documents section.

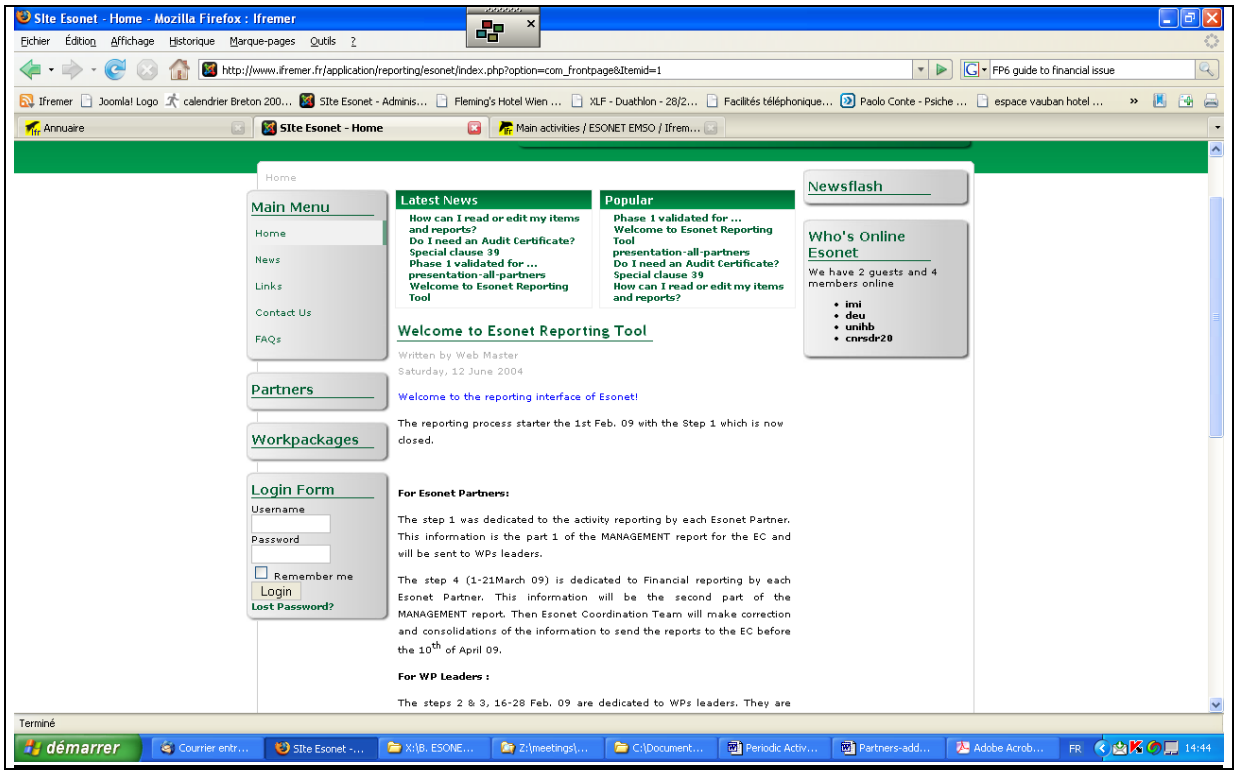


Figure 8.1: Welcome page of the reporting tool

Once logged in, a partner edits his reporting files and completes them. Work package leaders proceed in a similar way for WP reports.
The ESONET coordination team can track the reporting process in real time, request corrections or make some corrections.

Results:

Phase 1 worked correctly: even if the last report was received on the 28th of February, all expected activity reports were ready on the 1st of March 08. We only had problems with CNRS/GEOAZUR who replied with more than one month delay.
Phases 2 and 3 regarding WP reports were delayed by 2 weeks but to anticipate this delay we fixed an SC meeting in London on the 18-20th of March where all reports were finished.
Phase 4 was more or less completed on the 3rd of April: draft reports received the 3rd of April but with corrections needed

Help tool for reporting:
We organised a training session for reporting in ESONET in IFREMER Issy les Moulineaux at the end of January 2009.
Fourteen participants attended this one-day meeting:

Name	Institution	Country
Catherine Audebert	AWI	Germany
Eric Delory	DBSCALE	Spain
Nicolas Dittert	KDM-UniHB	Germany
Pieter Honkoop	NIOZ	The

Name	Institution	Country
		Netherlands
Agnieszka Janczy	CSA	Ireland
Cristina Lafratta	INGV	Italy
Livia Moreira	FFCUL	Portugal
Seda Okay	DEU-IMST	Turkey
Jaume Piera	CSIC	Spain
Angelique Prick	UiT	Norway
Luis Ramos	UPC	Spain
Johanna Schietke	KDM-UniHB	Germany
Jana stone	KDM-UniHB	Germany
Ulgen Umut	ITU-EMCOL	Turkey

With the following Agenda

TIME	TOPIC	DOCUMENT/INITIATOR
MORNING 9H30-12H30	**Introduction:** • General presentation • ESONET contract with EC • Presentation of the reporting process: What is expected from EU? • Results and conclusions after the 1st reporting process.	
	Presentation of the Online system and of the procedure: • Time schedule of the reporting. • The online system: a reporting management tool	
AFTERNOON 14H-17H30	**Information to input in the system** *(this would be the most important part)* • for the activities description per WP and task by task, • for the financial statement: o definition of main cost categories, eligible costs, cost models, etc o Budgeted costs and man-months o man-months to be distributed in ESONET WPs, o other Form C o how do we fill in Form C? o Who signs Form C? o other	
	All questions you would like to ask and discussions.	

A second meeting held in Toulon for CNRS members with a similar agenda:
List of attendees of the Second meeting:

Name	Institution	Country
Guy Ingarcia	CNRS-CPPM	France
Jean-Jacque Destelle	CNRS-CPPM	France
Tiphaine Zitter	CNRS-CEREGE	France
Patricia Brunier	CNRS-CEREGE	France

Slides are available on the ESONET website and a FAQs section was opened in the online reporting tool.

Task WP 8d) - Link with European Commission

- WP8 is in charge of the deliverables' gathering and yearly reporting for the European Commission. The reporting process for the first period was carried on until October 08 with the European Commission.
- Contract management

  One request of contract amendment was sent to the European Commission to add the UPC and LMGEM partners respectively to the CSIC and CNRS contractors (Special clause 23) and to modify the ALTRAN/ATLANTIDE contractor details. This amendment was definitely accepted.

  Moreover, another Amendment to the Contract requested during the first period to add the special Clause 39 on Audit certificates to Article 9 was definitely accepted during the second period (A).

  Another amendment request concerning the DT INSU and LMTG partners is in progress.
- Meeting with European Commission
- We co-organised the meeting with the oil industry in Brussels (November 2008).
- WP activity management with the help of the European Commission
- Within the framework of the preparation of internal calls for Staff exchange and demonstration missions, IFREMER submitted the calls to the European Commission and included requested modifications in partnership with WP3, WP4 and WP1 leaders.

NOCS worked with the coordinators to ensure the European Commission remains informed about the progress of various tasks as needed.

Task WP 8e) - Link with European projects

A major objective of the Science Objectives Workshop in Faro was to increase communication with other European projects. This is outlined in more detail in Deliverable 11 led by NOCS and the report of the WP3 meeting held in Faro (see Deliverable 31).

Relations with other European projects were reinforced: SeaDataNet, EuroSITES, KM3net, Euroceans, EMSO PP, HYPOX, NEAREST …

- **EUROSITES**
  - -A joint meeting with EUROSITES was organized in Vienna on April 16th 2008, involving ESONET Steering Committee members, Kate Larkin and Richard Lampitt. Many ESONET partners are also EUROSITES partners.
  - -A joint report was prepared on "Existing European deep ocean observatories and potential coordination with North American efforts" (K. Larkin, I. Puillat, R. Person)
  - -We invited R. Lampitt, coordinator of Eurosites, to participate in the General Assembly of ESONET held in Faro, Oct 2008.
  - -We invited M. Pagnani to participate in the extended Data Management council of ESONET held in Faro, Oct. 2008 (see deliverable 31).

- **CAREX**

Participation in the CAREX workshop in Sant Feliu de Guixols (Spain) December 3rd-5th 2008, (R. Person): This project tackles the issues of enhancing the coordination of European research on life in extreme environments by providing networking and exchange of knowledge opportunities to the scientific community and by developing a strategic European research agenda in the field. CAREX is a truly interdisciplinary initiative as its approach to life in extreme environment research covers microbes, plants and animals evolving in various marine, polar, terrestrial extreme environments as well as outer space. Links with observatory programs are essential.

- **Km3net/ Antares:**

Participation of Ingrid Puillat, Jean Marvaldi, and Jean François Drogou in the International Workshop on a Very Large Volume Neutrino Telescope for the Mediterranean Sea, LVnT08 - Toulon, Var, France, 22-24 April 2008

- **EMSO PP**

IFREMER is the deputy coordinator of EMSO PP and 3 persons attended the EMSO PP kick off held in Vienna, April 2008.
Yves Auffret, IFREMER, is both involved in ESONET WP2 and EMSO WP5.
Paolo Favali, INGV and EMSO coordinator and L. Beranzoli, INGV, are both ESONET Steering Committee members. Consequently the link with EMSO is actual and frequent.

- **EUR-OCEANS**

P. Tréguer was invited to participate in the ESONET Scientific Objectives workshop held in Faro. S. Pesant was invited to participate in the extended Data Management council of ESONET in Faro (see deliverable 31).

- **NEAREST and TRANSFER:**

INGV ensured profitable interaction with other EC projects in which INGV participated.

HYPOX (In-situ monitoring of oxygen depletion in hypoxic ecosystems of coastal and open seas, and land-locked water bodies) proposal was submitted to EC FP7 Call

ENV.2008.4.1.2.1. Area 6.4.1.2. This project involving several other ESONET partners will start in April 2008.MPG coordinates the project, AWI, UniHB, IFREMER, ITU-EMCOL, INGV, are involved as partners and WP leaders; IFM-Geomar participate as partners.

The UGOT partner is actively contributing to the link between ESONET NoE and other projects such as ESONIM, EMSO-PP, HYPOX (EC-7th FP), SENSENET (EC-People) and BOX (Swedish EPA project).

FORTH team is working in the DAMOCLES I.P. Through this involvement, exchange of knowledge and expertise is achieved in the area of Ocean Acoustic Tomography and Acoustical Oceanography in General.

In addition, ITU-EMCOL also participated in the following EC FP project proposals that involved ESONET partners, but not funded:
1. DEPREM: Dynamic Environment for Probabilistic Seismic HazaRd Evaluation: Marmara test area. Submitted to EC FP7 Call “ENV.2008.1.3.1.1. Proposal number: FP7-226932. Coordinator Prof. Dr. Atilla Ansal, Bosphorusi University. EMCOL is involved in offshore sedimentary earthquake records under WP3: Organization and homogenization of existing data. INGV and KOERI are the other ESONET partners.
2. EMCLIME “Eastern Mediterranean Climate and Environmental Changes”. Submitted to FP7-REGPOT-2008-1 call, proposal number 229862. The purposes are to develop Stable Isotope and Organic Geochemistry laboratories in EMCOL for and train young scientists in advanced paleoclimate and environmental research. EMCOL is the coordinator.
3. SeaMaxRegio “Supporting research infrastructures to maximize regional economic development”. FP7-REGPOT-2008-1 call, EPSS system with number 230072. The coordinator is INNOVA from Italy with the participation of EMCOL, the leading Turkish partner, with SUTA (The Underwater Technologies Research Institute) and Istanbul Project Coordination Unit (IPCU) of Istanbul Special Provincial Administration (ISPA) from Turkey, representing research, industry and local authority. INGV is the other ESONET partner.
4. MARMSEALAB: Marmara Seafloor Earthquake Laboratory. Proposal submitted to Call “ENV 2007 4.1.2.2: Contributing to the development of a worldwide network of in-situ observatories for seismogenic hazards”. Coordinator: Namık Çağatay (EMCOL). IFREMER, CNRS, College de France, INGV, ISMAR, KOERI and DEU are the other partners.

CNRS/LOV has a link with the SESAME project.

Task WP 8f) - ESONET Label

The ESONET Label is a set of criteria to be applied to deep-sea observatories in order to give them the “ESONET Observatory” title (or stamp). These criteria will ensure those observatories will be observing systems with a highly-controlled quality level and a durable integration of the sea observatory community at European level. This includes acceptable constraints on technology to deploy environmentally friendly sea observatories. Different classes of labels (2, 3 or more- class A-class B…) will be

defined according to respected criteria and to the type of observatory (cabled, acoustically linked…).
IFREMER initiated a document and presented it to the Steering Committee. This first document is mainly a general definition of what the ESONET Label should be. Nevertheless the completed definition of the label and how it should be applied is one of the main results of the ESONET NoE. The document will be continuously updated according to the upcoming results.
WP leaders are currently working on it. Concepts for developing the ESONET label were suggested by KDM-UniHB in particular referring to interface descriptions and quality plans that are essential for quality management procedures. The main aim will be that the operational history of the individual instrument can be traced back to certain events like calibration checks, deployments and operation intervals. This will form the base for describing the life cycle of the instrument, which is essential for all planning purposes.

Other: Milestone on M18 “Coordination with GMES plans and core services”: this was addressed by the coordination team within the framework of the WP6 (Deliverable D16)

2.8.3 Deviations from the project work programme, and corrective actions taken

Last year, some partners did not provide the elements requested by the coordinators to build the management report on time. It was assumed, in those days, that it was due to the complexity of the reporting process of a network of excellence. This year, an online reporting tool was created to make the process easier and faster and 2 training workshops were organized to help partners do these yearly reports.

2.8.4 Deliverables list

Del. no.	Deliverable name	Work package no.	Date due	Actual/Forecasted delivery date	Estimated indicative person-months (*)	Used indicative person-months (*)	Lead contractor
D31	General Assembly Report	WP8	20	23			IFREMER

* if available

2.8.5 Milestones list

Mil. no.	Milestone name	Work package no.	Date due	Actual/Forecasted delivery date	Lead contractor
M8-20	General Assembly meeting	WP8	20	20	IFREMER
M8-22	General Assembly report	WP8	20	23	IFREMER
M8-24	Periodic management report	WP8	26	26	IFREMER
M8-24	Periodic activities report	WP8	26	26	IFREMER

3 CONSORTIUM MANAGEMENT

3.1 Consortium management tasks and their achievements

3.1.1 Kick off meeting and General Assembly

The second General Assembly was held in Faro, Portugal, 20 months after the official starting of the network (1st March 2007). The objective of this second General Assembly was to share the main results after the first 18 months of activities and the programme until September 2009 for constructive discussions and comments. A specific session was set up during the second day for official approval of decisions made by the ESONET Steering Committee.

To summarize what was put forward during the General Assembly:
Main achievements for the first 18 months, i.e. the first call for Demonstration Missions (in month 2), the first call for exchange of personnel (in month 2 but no answer, then a new call took place in month 18), the first All Regions workshop (in month 6), the first Best Practices workshop (in month 8) and the first Educational and Training workshop (in month 12), the first reporting to the European Commission, and financial issues.
The general conclusion for these first 18 months is rather positive with successful meetings, the constitution of the working groups and a selection of four demonstration missions. It was highlighted that the integration process is a key element of success for ESONET because it will provide a good basis to consolidate the network during the remaining 2-5 years. ESONET has to carry on the integration at a higher level. The obligation to prepare a sustainable structure was put forward within the framework of the virtual institute (VISO WP1).

A session was dedicated to the approval of decisions made in the Steering Committee Meeting. They were unanimously approved (see deliverable 31).

3.1.2 Consortium Agreement

No modification was made to the consortium agreement for this reporting period.
Nevertheless IFREMER is preparing an associated partnership agreement in order to have official collaborations with non-ESONET partners. This Agreement will be applied during the 3rd period.

3.1.3 Steering Committee

Minutes of the Steering Committee meeting are all available on the website (partners only area):
http://www.esonet-noe.org/partners_only

Currently, the Steering Committee includes 18 members.
During this second year, six Steering Committee meetings were planned:

* *Vienna (Austria), 14-15-17 April 2008:*

Questions addressed: Debriefing of the 1st reporting period, the preparation of the negotiation phase, the Demonstration Missions and the organization of ESONET meetings (General Assembly, workshop…).

** Issy-les-Moulineaux (France), 13 May 2008*

Questions addressed: essentially focused on the ESONET budget for the Demonstration Missions, Sensor Registry.

** Virtual SC, September 2008*

Essentially focused on the request for funds transfer for WP4 (Demonstration Missions), WP3 (Best Practices Workshop) and WP7 (travel expenses for the Bremen workshop and the international summer school in Barcelona). This meeting also focused on the General Assembly preparation (in Faro, Portugal).

** Faro (Portugal), 20-21 October 2008*

Questions addressed: the cancellation of the SIS partner was decided; it was decided that a specific task would be added in the next version of the DoW for WP2 in year 3. Task 1e "International Cooperation" will be moved from WP1 to WP8. During this meeting financial issues were voted (last 2008 fund transfers).

** Virtual SC, 12 December 2008*

This meeting focused on the choice of proposals for the Exchange of Personnel. The financial part was also addressed (concerning man-months).

** Nice (France), 29-30 January 2009*

This meeting essentially focused on the choice of the Demonstration Mission proposals (second call) and on the final choice of the exchange of personnel.

Membership of chairpersons

Sylvie Pouliquen (Ifremer) was replaced by Gilbert Maudire (Ifremer), with approval by the General Assembly, as the chairperson of the data management council.

NIOZ participation to ESONET Steering Committee:

Jens Greinert attended the ESONET General Assembly in Faro, Portugal, as a replacement for Tjeerd van Weering who stepped back from coordinating ESONET at NIOZ due to his retirement in mid-2009. JG took part in the Steering Committee and Scientific Advisory Board meetings; he will be the NIOZ representative in the ESONET Steering Committee.

SEND participation to Esonet Steering Committee:

In May 2008 "SEND Signal Elektronik GmbH" had to file for bankruptcy. As a result, Dr. Thomas Buettgenbach left the company.

On 22-July-2008 Klaus Schleisiek founded the new company "SEND Off-Shore Electronics GmbH", which bought all assets of the "former" SEND from the receiver on 6-August-2008 with the intention to continue SEND's business with reduced staff. Klaus Schleisiek was prepared to resume the activities started by Dr. Thomas Buettgenbach. During the SC meeting held in Nice (Jan. 09) Klaus Schleisiek was elected to serve as the PESOS representative in the SC for another year. He will bring an industrial perspective into the SC discussions.

3.1.4 Strategic Committee

The second Strategic Committee meeting was organized on 22 October 2008 in Faro, Portugal, at the same time as the "General Assembly".
ESONET Countries are represented in the Strategic Committee:

Partner	Country	Delegate
Ifremer	France	Bruno Goffé
KDM	Germany	Sören Dürr
INGV	Italy	Angela Vulcano
NOCS	United Kingdom	Ed Hill
CSIC	Spain	Beatriz Morales Nin
University of Lisbon	Portugal	Mario Ruivo
Marine Institute	Ireland	Peter Heffernan
HCMR	Greece	George Chronis
NIOZ	The Netherlands	Carlo Heip
VR	Sweden	Dan Holtstam

During this meeting, cabled and non-cabled observatory issues were tackled. It was proposed that cabled and non-cabled observatories are to be complementary and that the choice of whether to cable the observatories would be made according to scientific, technical and budget reasons. This proposition was unanimously approved by the Strategic Committee (See more details in Deliverable D31).

3.1.5 Advisory Councils

The Advisory Councils are composed of the Data Management Council (DMC), the Test and Operation Council (TOC) and the Scientific Council (SC). These three Council meetings were organized at the same time on 23 October in Faro, Portugal, together with the General Assembly. Minutes of the meetings are included in Deliverable D31.

DMC Meeting:
This meeting was extended to non-DMC members, with the invitation of EuroSites and SeaDataNet representatives. Indeed, one of the meeting objectives is to build on collaborations between the 3 projects on common topics. Questions addressed were about Demonstration sites, the Sensor registry and the next future collaborations. This meeting succeeded to recommend elaborating a document on the cooperation between EuroSites, SeaDataNet and ESONET. It is also suggested to organize a meeting in spring 2009, maybe jointly with the Steering Committee, to make progress on these two documents.
Sylvie Pouliquen (Ifremer) was replaced by Gilbert Maudire (Ifremer), with approval by the General Assembly, as the chairperson of the data management council.

TOC Meeting:
This meeting began with a debriefing of running Demonstration Missions. Questions were addressed about the "post-Bremen Workshop", underwater interventions, sharing testing facilities and the collaboration with non-European observatory

initiatives. Five recommendations were established, among them: “it was decided to get information on the test and operation aspects by all the DMs and to push DM coordinators to write test and marine procedures”; “it was suggested to test the concepts of interoperability and sensor standardisation aspects with Mbari and NEPTUNE Canada”; and at last “there is a need to establish and extend the collaboration between the ESONET community and other non-European observatory initiatives” (See Deliverable D31).

SCC Meeting:
This meeting began with a debriefing of running Demonstration Missions. Questions were addressed about: the Next Demonstration Missions Call (“DM second call”), the WP3 report, the ESONET standard instruments and scientific objectives survey, the preparation of the VISO Workshop and at last the collaborations with European and non-European observatory initiatives. Five recommendations were established, among them: “it was recommended that projects complementary to existing demonstrations should be promoted”; “it was agreed it would be advantageous to continuously update and revise the report on Science Objectives each year”; and at last, “it was agreed it would be advantageous to continuously update and revise the report on Science each year” (See Deliverable D31).

3.2 Contractors

- ATLANTIDE was merged into the ALTRAN group and this was updated by an amendment to the ESONET Contract (requested in September 08 and acceptation in January 09).
- CNRS: LMGEM member is now represented by CNRS DR20 by means of the special clause 23 of the ESONET contract (Amendment requested in September 08 and acceptation in January 09).

The corresponding modifications of the DOW are made in the February 2009 version.

- SIS Sensoren Instr. partner did not provide the elements requested by the coordinators to write the management report, and this even after ultimatum letters were sent by post. To this date, as no reports were sent to the ESONET coordinator, the cancellation of SIS Sensoren Instr. from the ESONET project was unanimously decided by the General Assembly, which met in Faro on 22-23 October 2008 (Portugal).
- TFH BERLIN :Technishe Fachhochschule Berlin changed to Beuth Hochschule für technik Berlin
- CSA company changed to SLR consulting recently; only the name changed (same registration number)
- SEND company went bankrupt and was changed to SEND offshore Electronics GmbH.

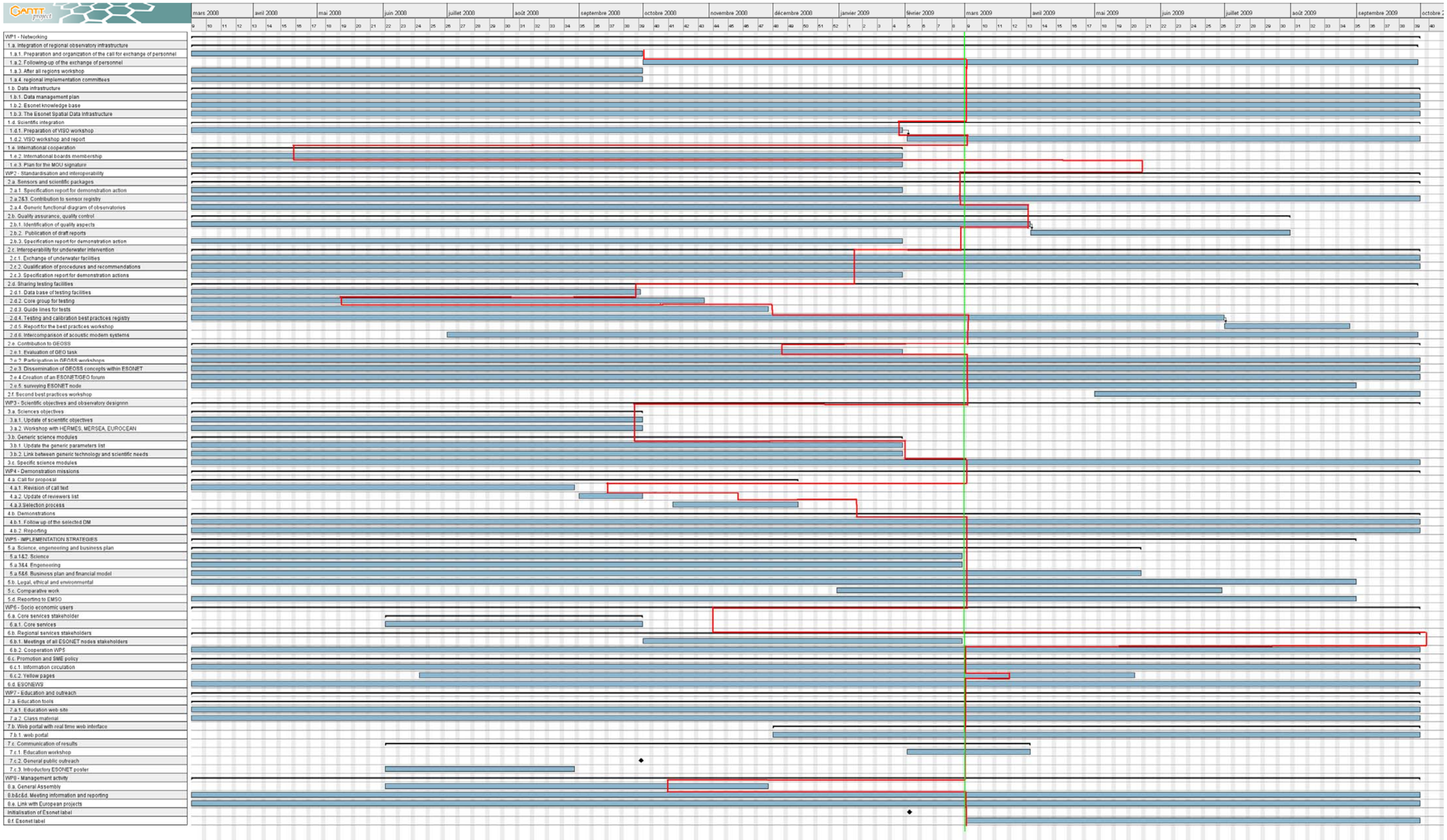
These changes are being processed by means of a contract amendment request within the framework of this reporting process.

3.3 Relations with other European Projects

See task 8e in section “2.8.2 Progress towards objectives” in the WP8 activity report (previous pages).

3.4 Project timetable and status

3.4.1 Project time table: GANTT diagram


mars 2008
avril 2008
mai 2008
juin 2008
juillet 2008
août 2008
septembre 2008
octobre 2008
novembre 2008
décembre 2008
janvier 2009
février 2009
mars 2009
avril 2009
mai 2009
juin 2009
juillet 2009
août 2009
septembre 2009
WP1 - Networking
1.a. Integration of regional observatory infrastructure
1.a.1. Preparation and organization of the call for exchange of personnel
1.a.2. Following-up of the exchange of personnel
1.a.3. After all regions workshop
1.a.4. regional implementation committees
1.b. Data infrastructure
1.b.1. Data management plan
1.b.2. Esonet knowledge base
1.b.3. The Esonet Spatial Data Infrastructure
1.d. Scientific integration
1.d.1. Preparation of VISO workshop
1.d.2. VISO workshop and report
1.e. International cooperation
1.e.2. International boards membership
1.e.3. Plan for the MOU signature
WP2 - Standardisation and interoperability
2.a. Sensors and scientific packages
2.a.1. Specification report for demonstration action
2.a.2&3. Contribution to sensor registry
2.a.4. Generic functional diagram of observatories
2.b. Quality assurance, quality control
2.b.1. Identification of quality aspects
2.b.2. Publication of draft reports
2.b.3. Specification report for demonstration action
2.c. Interoperability for underwater intervention
2.c.1. Exchange of underwater facilities
2.c.2. Qualification of procedures and recommendations
2.c.3. Specification report for demonstration actions
2.d. Sharing testing facilities
2.d.1. Data base of testing facilities
2.d.2. Core group for testing
2.d.3. Guide lines for tests
2.d.4. Testing and calibration best practices registry
2.d.5. Report for the best practices workshop
2.d.6. Intercomparison of acoustic modem systems
2.e. Contribution to GEOSS
2.e.1. Evaluation of GEO task
2.e.2. Participation in GEOSS workshops
2.e.3. Dissemination of GEOSS concepts within ESONET
2.e.4.Creation of an ESONET/GEO forum
2.e.5. surveying ESONET node
2.f. Second best practices workshop
WP3 - Scientific objectives and observatory designnn
3.a. Sciences objectives
3.a.1. Update of scientific objectives
3.a.2. Workshop with HERMES, MERSEA, EUROCEAN
3.b. Generic science modules
3.b.1. Update the generic parameters list
3.b.2. Link between generic technology and scientific needs
3.c. Specific science modules
WP4 - Demonstration missions
4.a. Call for proposal
4.a.1. Revision of call text
4.a.2. Update of reviewers list
4.a.3.Selection process
4.b. Demonstrations
4.b.1. Follow up of the selected DM
4.b.2. Reporting
WP5 - IMPLEMENTATION STRATEGIES
5.a. Science, engeneering and business plan
5.a.1&2. Science
5.a.3&4. Engeneering
5.a.5&6. Business plan and financial model
5.b. Legal, ethical and environmental
5.c. Comparative work
5.d. Reporting to EMSO
WP6 - Socio economic users
6.a. Core services stakeholder
6.a.1. Core services
6.b. Regional services stakeholders
6.b.1. Meetings of all ESONET nodes stakeholders
6.b.2. Cooperation WP5
6.c. Promotion and SME policy
6.c.1. Information circulation
6.c.2. Yellow pages
6.d. ESONEWS
WP7 - Education and outreach
7.a. Education tools
7.a.1. Education web site
7.a.2. Class material
7.b. Web portal with real time web interface
7.b.1. web portal
7.c. Communication of results
7.c.1. Education workshop
7.c.2. General public outreach
7.c.3. Introductory ESONET poster
WP8 - Management activity
8.a. General Assembly
8.b&c&d. Meeting information and reporting
8.e. Link with European projects
Initialisation of Esonet label
8.f. Esonet label

3.4.2 Overview of Deliverables status

Deliverable n°	Deliverable name	WP n°	Lead participant	Nature[1]	Dissemination level[2]	Date due	Delivery
D1	Define preliminary scientific priorities; Text of the call for proposal.	WP3 WP4	NOCS INGV	R	PU	2	12
D2	Report on regional observatory stakeholders.	WP6	FFCUL	R	CO	8	12
D3	ESONET class material on science background	WP7	KDM		PU	9	12
D4	Report on First educational and training workshops.	WP7	KDM	R	PU	12	12
D6	Proceeding of best practice workshop: sensor interface, quality insurance and specification for demonstration actions.	WP2	KDM	R	PP	12	12
D7	Report on constitution of integration groups; Proceedings of All Regions workshop. Report on potential creation of virtual institute.	WP1	KDM	R	PU	12	12
D9	Data management plan.	WP1	KDM	R	PU	6	9
D15	ESONET News "ESONET News – Europeans observe the deep sea"	WP6	IFREMER	R	PU	N°1 - 5 N°2- 8 N°3- 11	3 8 10
D20	Report on long-term planned research and co-operation between research organisations.	WP5	IFREMER	R	PU	12	12
D21	Document outlining agreement on co-operation between organisations involved in developing technology.	WP5	IFREMER	R	PU	12	12
D22	Report on confidential meetings between commercial companies and ESONET WP leaders working relationships and ESONET requirements.	WP5	Marine Institute	R	CO	12	12
D23	Report of meeting to discuss long-term funding for seafloor observatories involving representatives from funding agencies.	WP5	IFREMER	R	CO	12	12
D24	Report on integration between respective teams (research teams, technical teams, companies and SMEs) and working relationships beyond the life of ESONET.	WP5	IFREMER	R	PU	12	12

[1] Nature of the deliverable using one of the following codes: R=report / P = prototype / D = demonstrator / O = other

[2] Dissemination level using one the following codes: PU = public / PP = restricted to other program participants (including the Commission Services) / RE = restricted to a group specified by the consortium (including the Commissions Services) / CO = confidential, only for members of the consortium (including the Commission Services)

Deliverable n°	Deliverable name	WP n°	Lead participant	Nature[3]	Dissemination level[4]	Date due	Delivery
D5	First elements of individual implementation plans for specific cabled observatory sites.	WP5	Marine Institute	R	PP	24	24
D10	Report: exchange of personnel; common schedule and methodology of tests.	WP1	IFREMER	R	PP	18	23
D11	Report on scientific background and objectives.	WP3	NOCS	R	PP	18	18
D12	First periodical report on Demonstration Missions.	WP4	INGV	R	PP	18	22
D13	Report on science modules.	WP3	NOCS	R	PP	24	24
D15	ESONET News "ESONET News – Europeans observe the deep sea"	WP6	Ifremer	R	PU	14, 17, 20, 23, 26, 29	14,17, 20
D16	Report on core service stakeholders.	WP6	CSA	R	CO	18	24
D17	Report on promotion and SME policy.	WP6	IFREMER	R	PU	18	24
D18	Publish draft ESONET web portal.	WP7	KDM	0	PU	20	26
D19	Data infrastructure prototype.	WP1	KDM	P	PU	18	18
D20-2009	Report on long term planned research and cooperation between research organisations.	WP5	IFREMER	R	PU	24	25
D21-2009	Document outlining agreement on co-operation between organisations involved in developing technology.	WP5	Marine Institute	R	CO	24	24
D22-2009	Report on confidential meetings between commercial companies and ESONET WP leaders re working relationships and ESONET requirements.	WP5	IFREMER	R	CO	24	24
D23-2009	Report of on meetings to discussing long-term funding for seafloor observatories involving representatives from funding agencies.	WP5	IFREMER	R	PU	24	24
D24-2009	Report on integration between respective teams (research teams, technical reams, companies and SMEs) and working relationships beyond the life of ESONET	WP5	IFREMER	R	PU	24	24
D25	Specification report for demonstration actions – sensor interface.	WP2	KDM	R	PU	23	25
D26	Specification report for demonstration actions – quality assurance.	WP2	UNIABDN	R	PU	23	25
D27	Specification report for demonstration actions – subsea intervention.	WP2	IFREMER	R	PU	23	25
D29-2008	24th month activity report	WP8	IFREMER	R	PU	25	25
D30	Installation of computer terminals	WP7	KDM	0	PU	20	26

[3] Nature of the deliverable using one of the following codes: R=report / P = prototype / D = demonstrator / O = other

[4] Dissemination level using one the following codes: PU = public / PP = restricted to other program participants (including the Commission Services) / RE = restricted to a group specified by the consortium (including the Commissions Services) / CO = confidential, only for members of the consortium (including the Commission Services)

Deliverable n°	Deliverable name	WP n°	Lead participant	Nature[3]	Dissemination level[4]	Date due	Delivery
D31	General assembly report	WP8	IFREMER	R	PU	20	23
D32	Introduction to Demo Missions	WP7	KDM	0	PU	22	26
D33	Agreement on an International network	WP1	UNIABDN	O	PU	23	23-
D34	Plan for signature of MOU and contracts at international level. First signature of an agreement for testing of a prototype on NEPTUNE Canada (or Arena Japan or Mars USA)	WP1	UNIBABDN	R	CO	23	23
D35	Recommendations for ESONET registration in GEOSS	WP2	DBScale	R		23	25
D36	Report of testing facilities survey	WP2	IFREMER	P	OU	23	25
D37	VISO Workshop preparation report	WP1	UiT	R	PU	24	24
D38	Finish games and quiz section	WP7	KDM	0	PU	24	24

4 CONCLUSION

This report reviews the activities of the Network of Excellence ESONET after two years of existence. More than 381 people (215 researchers, 134 engineers and technicians, 32 students) participated in this second year activities of the network. This number will further grow in the coming months with the selection of two new demonstration missions (MODOO and MASOX-ARCOONE) and the possibility for associate members to participate in the networked activities.

The first year was mainly devoted to the launching of the network and the resolutions of the many administrative and operational issues raised by partners about the operation of a network of excellence. Most of them, despite having participated in projects Europeans were unaware of the specific contract needs of a network of Excellence. This induced some delays in the launching of a limited number of activities while most of the activities were conducted as planned.

Delays, which occurred in the first year have been eliminated and all the deadlines in the contract are met. Indeed, the start of demonstration missions during the first years has greatly boosted the network. All DMs contribute to the activities of all WPs. Exchanges of personnel proposed are mainly related to a demonstration mission. Note, however, the delay of one year by Momar DM because of the non-programming of the campaign by Ifremer in 2009.

At a wider level than the ESONET Community, the observatories initiatives are assembling through a word wide International Association of Sub-Sea Observatory Operators (IASSOO) and an agreement is circulating between NEPTUNE Canada, OOI, and DONET for signature.

The increased importance and diversity of tasks carried out within the WP1 will lead to the break between a new WP 1 devoted to regional integration, regional core group implementation and exchange of personnel and a new WP9 dedicated to data management. This will be applied during the two up coming years.

5 LIST OF ANNEXES

5.1 Annex 1: List of ESONET Bibliography references

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Website

Seismic Laboratory has website since 2005 as http://web.deu.edu.tr/seislab/. ESONET is included as a project partner as in Turkish and English.

5.2 Annex 2: Plan for Dissemination of knowledge

5.2.1 Exploitable knowledge and its Use

Exploitable knowledge (description)	Exploitable product(s) or Measures(s)	Sector of application	Time table for commercial use	Patents or other IPR protection	Owner and other partners involved
The Underwater Vision Profiler is a new sensor providing data on 1) large particulate matter (>60 microns) distribution in time and space and 2) zooplankton (> 500 micron) distribution. It is at 5 Hz frequency and can be connected to a CTD and other sensors. It allows to calculate instantaneous sedimentation rates and can be used on long term moorings. Its operational depth is 3000 m.		oceanography			CNRS-LOV
Development of an autonomous hydroacoustic data recorder	3 years of continuous recording of hydroacoustic data in the MOMAR area (2005-2008)	1. Seismic monitoring 2. Large sea mammals monitoring 3. Acoustic pollution	N/A		CNRS-IUEM J. Goslin CNRS-IUEM J.-F. D'Eu CNRS-IUEM J.-Y. Royer
Cabled deep sea-floor magnetic observatory		Magnetic field monitoring			CNRS-IUEM P. Tarits CNRS-IUEM J.-F. D'Eu
CTD-microcat SBE37 SMP	P,T,S	1.	2008-2009	ANTARES	CNRS-LMGEM COM, ANTARES
Optode O2 3830	O2	1.	2008-2009	ANTARES	CNRS-LMGEM COM, ANTARES
HAUSGARTEN time series	HAUSGARTEN time series	Biology & Oceanography	actually no commercial use expected		AWI
Web pages for education	online	Education	none	none	KDM-JUB
Standard interfacing concepts for sensors and instruments	*Standard document like IEEE 1451 or an*	all ocean related disciplines	*2010*	*No patents- but open, shared*	***KDM-UNIHB Ownership will be by all involved***

Exploitable knowledge (description)	Exploitable product(s) or Measures(s)	Sector of application	Time table for commercial use	Patents or other IPR protection	Owner and other partners involved
	extension of that			*knowledge*	***partners***
Links from science priorities to the needed parameters, sensors, and infrastructures	Relational Database	All			NERC-NOCS
Long-rerm record of CTD, optical, current and video data from a cold water coral site in the Gulf of Mexico	Time series	Oceanography, Sedimentology, Biology	-	-	Owner is NIOZ; cooperation with Univeristy Wilmington NC
Virtual Institute of Scientific Users of Deep Sea Observatories	Report	1. Data 2. oceanography of all disciplines 3. Observatories	Indefinite		UiT
DEMO mission	Cruise report	1. Data 2. oceanography of all disciplines 3. Observatories	Indefinite		UiT and IFREMER
ESONET data and power connection point on Troll A offshore platform. Connection point is a cabled seabed junction box fitted with standard ROV stab connection points mounted beside the Troll A observation well/seabed observatory. Seabed around troll contains pockmarks and evidence of gas seepage, as well as cold water corals.	Infrastructure	1Geohazard and marine biology	2009 or early 2010 (awaiting offshore operations)	None	Energy company StatoilHydro. Connection point is designed and to be installed by NGI. Connection point is made available to ESONET
Knowledge of the performance of new sensors (new fast responding optodes and 2-D planar optodes for oxygen, pCO2 sensors, current meters) has been gathered through deployments for a few weeks as well as vertical profiling and benthic chamber incubations in the Baltic Sea. Novel methods to compute sea-floor oxygen consumption have been developed and tested based in the obtained sensor results.					Dept. of Earth Sciences, UGOT; National Environmental Institute, Denmark; Aanderaa Data Instruments, Norway; IFM-GEOMAR, Germany

5.2.2 Dissemination of knowledge including articles in press and published

Planned/Actual Dates	Type*	Type of Audience**	Targeted Countries	Size of Audience	Partner responsible/Involved
May 2008	Conference	Higher education	China		IFREMER, Blandin
March 2008	Conference	Higher education	USA		IFREMER, Person
April2008	Conference	Higher education	Japan		IFREMER, Person
March 2008	Conference	Higher education	Japan		IFREMER, Person
April 2008	Conference	Higher education	Austria		IFREMER, Puillat
April 2008	Conference	Higher education	France		IFREMER, Puillat
March 2008	Conference	Higher education	Germany		IFREMER, Delauney
March 2008	Conference	Higher education	Turkey		IFREMER, Géli
Sept. 2008	Conference	Higher education	Germany		IFREMER, Géli
Dec. 2008	Conference	Higher education	USA		IFREMER, Géli
Sept. 2008	Poster	Higher education	Belgium		IFREMER, Person
2008	Article	Higher education	-		IFREMER, Puillat
2008	Article	Higher education	-		IFREMER, Géli
2008	Article	Higher education	-		IFREMER, Géli
Sept. 2008	Conference	Higher education	Germany		CNRS-GEOAZUR, Zitter
Dec. 2008	Conference	Higher education	USA		CNRS-GEOAZUR, Zitter
Dec. 2008	Conference	Higher education	USA		CNRS-GEOAZUR, Deschamps
2008	Article	Higher education			CNRS-CEREGE, Bourry
2008	Article	Higher education			CNRS-CEREGE
March 2008	Conference	Higher education	Turkey	worldwide	CNRS-CEREGE, Henry
April 2008	Conference	Higher education	Austria		CNRS-CEREGE, Henry
Oct. 2008	Conference	Higher education	UK		CNRS-CEREGE, Henry
Dec. 2008	Conference	Higher education	USA		CNRS-CEREGE, Tary
2008	Conference	Higher education	-		CNRS-CEREGE, Burnard
Oct. 2008	Conference	Higher education	France		CNRS-CEREGE, Henry
2008	Book	Higher education			CNRS-CEREGE, Henry
2008	Conference	Public			CNRS-CEREGE, Henry
2008	Book	Higher education			CNRS-CEREGE, Possemeyer

*Conference, Exhibition, Publications, Project web-site, Posters, Flyers, Direct e-mailing, Film/Video...
**General public, Higher education, Research Industry (Sector x)...

Planned/Actual Dates	Type*	Type of Audience**	Targeted Countries	Size of Audience	Partner responsible/Involved
2008-2009	Project website	Higher education and General public	International	worldwide	CNRS CEREGE
8-11 April 2008	Conference	Higher Education & research, Research Industry	International		CNRS-IUEM, D'Eu et al.
13-17 Oct. 2008	Conference	Higher Education & research, Research Industry	France, Europe	1000	CNRS-IUEM, J. Goslin et al.
15-19 Dec. 2008	Conference	Higher Education & research	USA	17000	CNRS-IUEM, Goslin, Royer et al.
2008	Article	Higher Education & research	International		CNRS-IUEM, Goslin et al.
2008	Web-site	General public	France, International		CNRS-IUEM, Goslin, Royer, D'Eu, Tarits
ASLO - Jan'09	Conference	Higher Education	International	2500	CPPM, COM, ANTARES
2009	Article	Research	global		AWI, Bauerfeind
2009	Article	Research	global		AWI, Bergmann
2009	Article	Research	global		AWI, Soltwedel
Janv. 2009	Conference	Higher Education			AWI, M. Klages & T. Soltwedel
Feb. 2009	Conference	Higher Education			AWI, M. Klages
Feb. 2009	Workshop	Higher Education			KDM-MPIMM
October, 2008	Conference	Higher Education & research	global	50	KDM-UniHB
April 2008	Conference	Higher Education	International	Europe	INGV (P. Favali, L. Beranzoli, D. Embriaco)
Dec. 2008	Press release (TV)	Higher Education	Germany	General public	INGV (P. Favali)ISMAR (Zitellini)
Jan. 2009	Conference	Higher Education	International	World-wide	INGV (P. Favali)
Sept. 2008	Conference		Italy		ISMAR, Gasperini
Aug. 2008	Conference				ISMAR, Taviani
Dec. 2008	Poster & talk	Research	Europe	100	NOCS & Ifremer
Jan. 2009	Poster	Research	International	1000	NOCS & Ifremer
Sept. 2008	Poster	Research	Europe	50	NOCS & Ifremer
Feb. 2009	Conference	Research	Europe	30	NOCS
2009	Articles /Conference	Research	All		FORTH
2008	Conference	Research	All		FORTH
2008	Articles	Research	All		FORTH

Planned/Actual Dates	Type*	Type of Audience**	Targeted Countries	Size of Audience	Partner responsible/Involved
2008	Article	Research	All	World	NIOZ, Mienis
2008	Article	Research	All	World	NIOZ, Mienis
2008	Thesis	Research	All	World	NIOZ, Mienis
2009	Article	Research	All	World	NIOZ, Davies
3 March 2008	Conference	EC, Higher Education & Research Industry	EU	120	MI
20-21 March 2008	Workshop	ESONET Researchers	EU	15	MI/CSIC
15th July 2008	Conference	Higher Education & Research Industry	Ireland	20	MI
21 Oct 2008	Conference	Higher Education & Research Industry	Ireland	20	MI
22-23 Oct. 2008	Conference	ESONET Researchers	EU	120	MI
12-13 Jan. 2009	Workshop	ESONET technicians, engineers & researchers	EU	15	MI
6 Feb 2009	Conference	EC, Higher Education & Research Industry	EU	120	MI
11 Feb 2009	Conference	Higher Education & Research Industry	Ireland	50	MI
July	Conference	General public; Higher Education	Portugal	100	UAc
25/02/2009	Press Release	General Public	Spain	2000000	CSIC
Jan. 2009	Conference	Higher Education	France		CSIC
April 2009	LIDO Project Website	General Public and Registered Users	National, European, International	Unlimited	LAB-UPC

Planned/Actual Dates	Type*	Type of Audience**	Targeted Countries	Size of Audience	Partner responsible/Involved
Spring 2009	Article	Scientists	International		LAB-UPC
Fall 2008	Article	Scientists	International		LAB-UPC, IFREMER
Spring 2008	Conference	Scientists	International		LAB-UPC, IFREMER
Spring 2009	Conference	Scientists	European		LAB-UPC, LIDO Partners
Spring 2009	Conference	Scientists	European		LAB-UPC, INFN
Spring 2009	Conference	Scientists	European		LAB-UP
Spring 2009	Article	Scientists	International		LAB-UPC
11-12 June 2009	Workshop-Flyer-Press-Report-Web site	Researchers-Press-Industry	Norway-Europe-Japan-USA	< 150	UiT is the organizer but all partners are participating
30 June 2008	Conference	Scientists	International	50	NERSC
22 Aug 2008	Workshop	Scientists	Norway	50	NERSC
2008	Conference	Scientists	Paris		NERSC, Sagen
2008	Conference	Scientists	Paris		NERSC, Skarsoulis
2009	Article	Scientists			ULB, Carrière
Oct. 2008	Conference	Higher Education			ULB, Carrière
Sept. 2008	Conference	Higher Education	Canada		ULB, Carrière
April 2008	Conference	Higher Education			ULB, Carrière
June 2008	Conference	Higher Education	USA		ULB, Carrière
Jan. 2009	Conference	Higher Education	France		UGOT, Tengberg
Jan. 2009	Conference	Higher Education	Chile		UGOT
16 June 2008	Press release	General public	Turkey	20-30 Millions	ITU, IFREMER,CNRS,ISMAR
11 July 2008	Popular sci.art.	General public	Turkey	5 Millon	ITU
25 July 2008	Popular sci.art.	General public	Turkey	5 Millon	ITU
23 June 2008	Radio	General Public	Turkey	3 Million	ITU
16 June 2008	TV	General Public	Turkey	30-40 Miilion	ITU, IFREMER, CNRS, ISMAR
17 June 2008	TV	GeneraL PUBLİC	Turkey	20 Million	ITU
2008	Article	Higher Education			ITU, Eris
2008	Article	Higher Education			ITU, Irvali
2008	Article	Higher Education			ITU, Çağatay

Planned/Actual Dates	Type*	Type of Audience**	Targeted Countries	Size of Audience	Partner responsible/Involved
2008	Article	Higher Education			ITU, Görür
2008	Article	Higher Education			ITU, Çağatay
2008	Book	Higher Education			ITU, Görür
March 2008	Conference	Higher Education	Turkey		ITU, Görür
March 2008	Conference	Higher Education	Turkey		ITU, Çağatay
April 2008	Conference	Higher Education	Austria		ITU, Çağatay
April 2008	Conference	Higher Education	Austria		ITU, Özeren
Dec. 2008	Conference	Higher Education	USA		ITU, Çağatay
2008	Article	Higher Education			DEU, Kim
2009	Article	Higher Education			DEU, Dondurur
April 2008	Conference	Higher Education	Turkey		DEU, Coskun
Sept. 2008	Conference	Higher Education	Germany		DEU, Dondurur
Sept. 2008	Conference	Higher Education	Germany		DEU, Dondurur
Oct. 2008	Conference	Higher Education	Turkey		DEU, Gürçay
Nov. 2008	Conference	Higher Education	Turkey		DEU, Coskun
Nov. 2008	Conference	Higher Education	Turkey		DEU, Gürcay
Dec. 2008	Conference	Higher Education	USA		DEU, Cifci
Dec. 2008	Conference	Higher Education	USA		DEU, Cifci
Dec. 2008	Poster	Higher Education	USA		DEU, Cifci
Sept. 2008	Cruise report	Scientists			DEU, Selin
2005-2008	Website	Scientists			DEU
2008	Publication	Research Industry	EU	6000	SLR/FFCUL
2008	Conference	Marine Industry	Worldwide	20000	SLR/IFREMER
March 2009	Web site	ESONET partners	All	All partners	ALTRAN & UPC
Oct. 14-17 2008	Conference	Scientific	France	500	DBSCALE-KDM/Unihb/MARUM
Oct. 2008	Conference	Research, Industry	International	500	DBscale, Eric Delory
May 2008	Workshop	Higher Education	Portugal		Cintal

5.3 Annex 3: Male-Female Ratio

Participant number	Participant short name	Number of researchers to be integrated			Number of registered doctoral students in the network		
		Female	Male	Total	Female	Male	Total
1	IFREMER	9	37	46	0	0	0
2	IPGP	2	9	11	1	1	2
4	CNRS	4	19	23	1	1	2
5	SOPAB	1	1	2	0	0	0
6	KDM	0	19	19	1	4	5
12	INGV	5	11	16	0	0	0
13	ISMAR	1	7	8	0	0	0
14	INFN	0	4	4	0	0	0
15	TECNOMARE	1	5	6	0	0	0
16	NERC-NOCS	3	13	16	0	0	0
17	HCMR	1	12	13	0	0	0
18	FORTH	0	4	4	0	2	2
19	NIOZ	1	4	5	0	0	0
20	IMI	1	5	6	0	0	0
21	UAç	4	5	9	3	0	3
22	UALG	1	3	4	0	0	0
23	FFCUL	1	7	8	0	0	0
24	CSIC	2	8	10	1	2	3
24	UPC	4	12	16	0	3	3
25	UIT	1	4	5	0	0	0
26	NGI	0	5	5	0	0	0
27	NERSC	1	1	1	0	1	1
28	ULB	1	3	4	0	1	1
29	UGOT	0	3	3	0	0	0
30	SU	0	3	3	0	0	0
31	TFH-BERLIN	0	3	3	0	2	2
32	IO-BAS	1	4	5	0	0	0
33	ITU	1	8	9	1	3	4
34	BU.KOERI	0	5	5	0	0	0
35	DEU-IMST	1	7	8	2	2	4
36	ALCATEL	0	1	1	0	0	0
37	FUGRO	1	0	1	0	0	0
38	SLR Consulting	1	2	3	0	0	0
39	SERCEL	0	4	4	0	0	0
40	Nke	0	2	2	0	0	0
41	GURALP	0	1	1	0	0	0
42	ALTRAN	0	5	5	0	0	0
44	UNIABDN	1	2	3	0	0	0
45	NSW	0	1	1	0	0	0
47	TESEO	0	2	2	0	0	0
48	SEND	0	1	1	0	0	0
49	DBSCALE	1	1	2	0	0	0
50	CINTAL	0	4	4	0	0	0
Total		51	257	308	10	22	32