



Project n. 037110

NEAREST

"Integrated observations from NEAR shore sourcES of Tsunamis: towards an early warning system"

Instrument: STREP

Thematic priority: 1.1.6.3 GOCE (GlObal Change and Ecosystems)

PERIODIC MANAGEMENT REPORT

Period covered from 1/10/2007 to 30/09/2008

Start date of project: 1/10/2006

Project coordinator name: Nevio Zitellini Project coordinator organisation name: ISMAR Date of preparation 05/12/2008

Duration: 3 years

1. Justification of resources

Contractor 1 ISMAR BO (coordinator)

Activities performed

WP1 During the firsts months of year two (months 13-16), ISMAR contributed to the final preparation of the maps (deliverables D1 and D2) due by this work package, in particular:

Task 1.1 Review of sources of tectonic origin: ISMAR participated to the final interpretation of the geophysical data set along with the high resolution morpho-bathymetric data set derived from the SWIM Compilation made by CSIC. The major outcome of this activity is synthesized by the manuscript submitted on August 31, 2008 for publication to Earth Planetary Science Letter Magazine - N. Zitellini, E. Gràcia, L. Matias, P. Terrinha, M.A. Abreu, G. DeAlteriis, J.P. Henriet, J.J. Dañobeitia, D.G. Masson, T. Mulder, R. Ramella, L. Somoza and S. Diez; The Quest for the Africa-Eurasia plate boundary West of the Strait of Gibraltar. The paper is already accepted for publication by EPSL.

Task 1.2 Review of sources due to slope instabilities: Based on the data base created during the first year concerning the sampling stations and the description/dating of the cores ISMAR participated to the final interpretation/discussion an preparation of delivery D2 (review of sources due to slope instability)

WP2 Most of the activities of ISMAR were focused on the preparation of Deliverable D4 (depth migrated multi-channel seismic profile), in particular:

Task 2.1 Reprocessing and Pre-stack depth migration of existing MCS data. ISMAR completed the re-processing of the lines AR01 and AR10.

Task 2.2 Wide-Angle reflection/refraction acquisition experiment. ISMAR was deeply involved on the final choice of the location of the refraction lines to be acquired during the forthcoming survey (planned to occur on October- November 2008 (months 25-26).

- WP3 Task 3.4 Cruise for recovery of the broadband OBS: ISMAR was in charge of the planning and of the management of the cruise carried out on August 2008 by the R/V Urania (Italian flag). The campaign was divided in two legs. The first leg was devoted to the recovery of the 24 OBS deployed on first year (August 2007) for the seismological monitoring. This work included the request of permission to the local Portuguese and Moroccan authorities for the operations at sea, contacts with the local ship agent for logistics and mod/demob of the instruments, organization of the port calls, supervision of embarking personnel and arrangement of all the other activity related, as transportation of equipment and travelling. Personnel of ISMAR participated to the Campaign and ISMAR contributed on the preparation the cruise report (Deliverable D8b) concerning the first leg.
- WP 4 Task 4.4 Preparation planning and implementation of a long-term mission; cruises for deployment and recovery. As for WP3, task 4, ISMAR was in charge of the planning and of the management of the cruise carried out on August 2008 by the R/V Urania (Italian flag). The second leg was devoted to the recovery of the Abyssal station "GEASTAR-like" deployed on first year (August 2007) for the early tsunami detection. This work included the request of permission to the local Portuguese and Moroccan authorities for the operations at sea, contacts with the local ship agent for logistics and mod/demob of the instruments, organization of the port calls, supervision of embarking personnel and arrangement of all the other activity related, as transportation of equipment and travelling. Personnel of ISMAR

participated to the Campaign and ISMAR was responsible on the preparation the cruise report (Deliverable D15b) concerning the second leg.

Task 4.5 Data back-up, quality checks, preparation of the data base to be integrated with other data; pre-analysis of 'parent' tsunami signals. After the recovery of the Abyssal station occurred on month 23, ISMAR was deeply involved, during month 24, on the quality check of the data acquired during the 12 months mission of the station. In particular, ISMAR processed the bottom pressure data and checked them with the ones recorded by the CTD installed on board GEOSTAR. The first step was to fill the missing data in the bottom pressure time series acquired by bottom pressure sensor and by the CTD. The following step was to check the two time series. After these procedures, the same Tsunami Detection Algorithm installed on the GEOSTAR CPU was applied against the bottom pressure data, in order to check the log file with detected events saved by GEOSTAR CPU during the mission.

WP5 Task 5.2 Development of automatic procedures for rapid determination of seismic parameters and definition of thresholds for triggering the tsunami detection procedures. ISMAR developed an algorithm able to refine the tsunami triggering threshold down to 1cm that can be used both for warning and scientific purpose.

Task 5.4 Testing the tsunami warning system using synthetic data streams generated at WP8. ISMAR developed a code for the simulation of synthetic tsunami overlapped to real sea-floor pressure data. These synthetic records have been used to produce a statistics of the failures and effectiveness of the Tsunami Detection Algorithm with respect to tsunami wavelength and amplitude in function of the selected threshold value.

WP6 Task 6.1 Onshore sedimentological evidence of tsunami records. ISMAR team was involved in the elaboration/interpretation of the paleomagnetic, rock magnetic grain size, 210Pb and 137Cs chronology data obtained from the samples collected at Boca do Rio during the first year of the project. Further investigations have been carried out to reconstruct the tsunami wave direction by measuring the anisotropy of the magnetic susceptibility (AMS) recorded by samples collected from Trench-1 and 3 at Boca do Rio. In addition, ISMAR participated to the field trip in the Moroccan Atlantic estuaries of Mouly Bousslham and Larache from 27 to 30 March 2008 and successively on the elaboration and interpretation of the data. Two short cores collected in the lagoon of Moulay Bousslham were scanned for magnetic susceptibility and sampled for dating.

Task 6.2 Offshore sedimentological evidence of earthquake events. During the campaign at sea carried out on August 2008, ISMAR performed a multi-beam survey offshore the Moroccan coast (see cruise report, deliverable D15b), North of Rabat, to map the source area o one of the largest submarine slides on the Moroccan continental slope. During the following month (month 24) ISMAR completed the elaboration of the data to be merged with the already exiting bathymetric data set.

WP7 Task 7.1 Collation of the New Bathymetric Data. During the survey carried out on August 2008 ISMAR completed the swath bathymetric investigation of the area offshore the coast between Sagres and Portimao (Algarve Region, South Portugal). In fact, during the first year, it was collected by FFCUL the shallowest portion, between 100 meters and 5 meters water depth. With the Urania we filled the gap between the shaloow survey and the data already available to Nearest community. See cruise report for location and the details (Deliverable D15b). ISMAR was also in charge for the processing of the new data set and for merging it with the data collected previously.

Task 7.2 Implementation of a numerical tsunami model for SW Portugal. ISMAR collaborated with the FFCUL team to define at best the suitable boundary condition and source parameters to feed the models for tsunami generation. In addition, ISMAR

developed a model for tsunami generation in a compressible water layer overlying a porous sediment layer. This new model can be implemented into the generation and propagation models used until now. During the next months it will be possible to accounts for these new physical parameters, in order to take into account the effects of water compressibility and of the coupling between water column and sea floor sediment.

- WP8 Task 8.1 Simulation of tsunami generation scenarios. ISMAR developed a numerical code for the simulation of a new model for tsunami generation in a compressible water column overlying a porous sediment (see WP7, task 2). The simulation results allowed ISMAR to analyze the coupling effect of the acoustic waves generated by the earthquake with the tsunami wave. In fact the acoustic waves induced by the earthquake interfere with the tsunami wave, the latter lying in a lower frequency range with respect to the former. Moreover, the model allowed ISMAR to address the scientific problem of the coupling between water column and porous sediment during the generation process, taking into account the low pass filter nature of the porous layer.
- WP9 Task 9.2 Project web site. ISMAR kept continuously updated the nearest websitehttp://nearest.bo.ismar.cnr.it/, which is used by the partners not only to post the most important news and activity report but is also used for "protected" data exchange among the different Nearest teams throughout the ftp service implemented in the website.

Task 9.3 Contact database. ISMAR continued to collect the information from the partners to prepare at best the contact data base.

Task 9.4 Diffusion plan. ISMAR continued the actions undertaken since the first year, concerning the coordination of the dissemination of NEARESY results achieved through the media as radio, TV channel, or by participation to specialists conferences and scientific congresses.

WP10 ISMAR assured the general coordination of all activities carried within the project during the second year of activity. In particular:

Task 10.1 Project management in conformity with the Contract and the Steering Committee decisions. ISMAR granted the coordination of the partners activities throughout the continuous monitoring of research and advancement carried out by the different teams. Two plenary meetings were arranged during this reporting period.

Task 10.2 Project Technical and management reporting. ISMAR coordinated the preparation and assembled the Periodic Activity Report of the first year of activities as well as the Periodic Management Report for the same reporting period.

Task 10.3 Project progress assessment reports. ISMAR coordinated the collection of technical and financial information about occurred from October 2007 to March 2008, in order to assess the activities carried out in the third semester of the project as established in the Consortium Agreement.

Task 10.4 Coordinate scientific reporting and data dissemination. ISMAR coordinated the efficiency and the harmonization among partners of the scientific reporting as well as papers and presentation in national and international events.

Task 10.5 Management of project web-page. ISMAR periodically and upon partners request continuously upgraded the Nearest web pages. In addition, during the second year, an educational section started to be built by ISMAR addressed mainly to young people to promote tsunami education

Task 10.6 Organize Project meeting and workshops. ISMAR coordinated the first annual plenary meeting held in Marrakech (October 25-26, 2007) and the second mid-year plenary meeting held in Barcelona (May 8-9, 2008).

Costs occurred

<u>Personnel costs:</u> ISMAR costs are in line with the planning and are mostly related to ISMAR permanent staff involved in the project plus the salary of one researcher and one post-doc hired to accomplish the project tasks:

WP1 and WP9 One young researcher (Gabriela Carrara) working full time from Oct.1st 2007 to upgrade the geologica/geophysical data base and for the maintenance of the NEREST web site. In addition she was involved in the coordination of the data dissemination.

WP4 and WP5 One Post-Doc researcher (Luca Pignagnoli) working full time from Oct.1st 2007 for the development of the algorithms for the tsunami detection. He analyzed the data acquired by the bottom pressure sensor and applied and tested the detection algorithm installed on the GEOSTAR CPU. Moreover he worked on the development of a new model for tsunami generation taking into account the local compressibility of the water column and the effect of the sedimentary layer. He developed a numerical code for the simulation of this model.

<u>Travels:</u> The majority of these costs are related to the coordination activity, participation to the annual and mid-year plenary NEAREST meetings, Moreover ISMAR participated to the fields trips for the sampling of the tsunami deposits in Algarve, and to the Urania cruise held in August 2008. in particular:

- participation of Bellucci, Vigliotti, Chierici, Zitellini, Carrara at the annual Nearest meeting held in Marrakech on October 25-26, 2007;
- participation of Vigliotti, Chierici, Zitellini, Carrara at the second mid-year plenary meeting held in Barcelona (May 8-9, 2008);
- participation of Zitellini, Carrara, Chierici at the NEAREST campaign on board of R/V Urania (Aug 2008);
- participation of Vigliotti to the field trip for tsunami deposit in the Algarve;
- participation of Vigliotti and Bellucci to the field trip for tsunami deposit in Morocco in March 2008
- participation of Pignagnoli and Chierici to the EUG meeting held in Vienna on April 2008;
- participation of ISMAR personnel to various technical meetings held in Italy and abroad in the partners country for the needs of the project.

<u>Consumables</u>: Most of the consumable are related to the Mob/Demob of the NEAREST 2008 Urania campaign; stationary for office and photocopies of MCS lines. In particular:

- Port call expenses related to the R/V Urania in area of operations: Faro (Portugal),
- Port call expenses related to the R/V Urania in Palermo (Italy,) port of departure and of return

<u>Indirect costs:</u> indirect costs are computed as 79%6 of the personnel costs as established by the Central Administrative Office of C.N.R.

No major deviation occurred. Nevertheless, ISMAR had to re-tune the month-power in relation to the new needs of the project raised during the first year of activity. In particular less effort was required in WP2 because of the shift to the third year of the refraction campaign, less effort was required in WP3 because we overestimated ISMAR contribution for the second year, more effort was required in WP4 because we realized that the testing of the detection algorithm installed on the GEOSTAR CPU was more time consuming. In addition, ISMAR found necessary to develop a new model for tsunami generation taking into account the local compressibility of the water column and the effect of the sedimentary layer. Along with the theoretical studies ISMAR developed a numerical code for the simulation of this model.

Contractor 2 FFCUL

Activities performed

- WP1 Final elaboration of contribution from all partners involved and preparation of deliverable D1 "Review of sources of tectonic origin" completed in January 2008 and of the Deliverable D2 "Review of sources due to slope instabilities" completed in February 2008.
- WP3 Participation on the OBS recovery cruise and data quality control on board. Operation of 2 seismic land-stations to complete the network coverage.
- WP5 Integration of tide-gauge data at IM data collector.
- WP6 Organisation and realisation of geophysical surveying of the lowland in Boca do Rio (Algarve, Portugal), 15 17 October 2007

Organisation of a field survey in Salgados Lagoon (Armação de Pera, Algarve, Portugal), 2-4 November, 10 - 12 November, 16 - 18 November 2007. Work consisted in field survey and coring added by geomorphological observation and sampling of the confining beach-dune barrier. Limited sediment sampling has been undertaken in the field to characterize and date the major litho-stratigraphic units and bench marks were emplaced to obtain precise georeferenciation and altimetry of coring points

Organisation of a field survey in Western Algarve (Portugal) sampling of analogues, 2-4 November, 25 – 29 February 2008. Work consisted in dredge sampling of the shallow inner and collection of surface samples of present day intertidal and supratidal coastal sedimentary environments of beach, foredune, washovers.

Participation to Moulay Bousselham lagoon and Loukos estuary (Morocco), 26 - 30 March 2008, organized by University Chouaib Dukkali – Fac Sciences El Jadida. This work consisted essentially in coring of upper Holocene sedimentary sequences in lagoonal and estuarine environments and two representatives were recovered for lab processing.

Organisation of a field survey to Arade estuary and rocky coast Ferragudo – Ponta do Altar (Algarve, Portugal), 8 - 11 April 2008. Work consisted in survey of the rocky coast to the east of the Arade estuary up to the Ponta do Altar and coring of the Arade estuary marshes.

Organisation of a field survey to Alcantarilha lowland (Armação de Pera, Algarve, Portugal), 17 – 20 June 2008. Work consisted in field survey and coring of the

Alcantarilha lowland, close to the Salgados lagoon, added by geomorphologic observation and sampling of the confining beach-dune barrier.

Overview and interpretation of the geology and geomorphology of the Algarve coastal fringe, focused on features favouring/constraining tsunamigenic inundation, completed. Detailed geomorphologic representation of each surveyed/sampled site under construction. Completed

Compilation of published material on sedimentary deposits associated with the tsunami in the Algarve, completed.

Field and laboratory descriptions of cores matched and corrected. Laboratory work on the sediment cores started, sedimentological, dating and paleoecological processing of samples in due course.

Size, volume and mass distribution of boulders in due progress, to assess (tsunami versus storm) mechanisms of emplacement.

Reconstruction of the 18th century paleosurface at BDR and of the amount of erosion due to tsunami flooding, completed.

WP7 The swath bathymetric survey was completed by the end of July 2008. Due to some calibration problems the data is being reprocessed by GEOSUB.

Preliminary inundation maps for Boca do Rio and Casablanca were prepared with the COMCOT-Lx model. The flow depths computed by the model agree well with historical data.

Tsunami hydrodynamic modelling was performed with an adopted version of the COMCOT code (Liu et al., 1994), named COMCOT-Lx.

The coastal area, in study is susceptible to tsunami wave amplification due to the very shallow bathymetry offshore Casablanca and the existence of quite flat low areas close to the sea makes the area prone to tsunami flooding.

The performance of COMCOT-Lx was tested against the benchmark tests proposed by Liut et al., (2004) and Synolakis et al., (2007). These Nearest tests were computed in collaboration with the TRANSFER projects as established.

WP8 Definition of the template for the generation of large tsunamis in the Gulf of Cadiz.

Investigation on the use of JRC grid computations for the Portuguese TWS (Tsunami warning system.

Investigation of NOAA/PMEL tools to assist the exploration of propagation and inundation scenarios in the prototype of a TWS.

WP10 Participation to Project and Steering Committee meetings in Marrakech (October 07) and Barcelona (May 08).

Participation to the specific NEAREST workshop on "Tsunami Hazard on Moroccan coasts: multidisciplinary approach", Rabat, 26-31 March 2008.

General management of the all FFCUL working groups, reporting in due dates

Costs occurred

Personnel Costs: Employment costs of

- Henrique Duarte and Ana Cristina Roque (WP1)
- Maria Alexandra Oliveira (WP6),
- Rachid Omira (WP7),
- Lívia Moreira (WP10)

Subcontracting: Reconversion of Cascais and Lagos acoustic maregraphers

Travels:

- Attendance FFCUL delegations to the project plenary meetings in Marrakech (Oct 2007) and Barcelona (May 2008).
- Participation of Sónia Silva concerning the OBSs cruise.
- Attendance of a focussed meeting, with the project coordinator, in Bologna.
- Participation to field work for data collection in the seismic stations of Pampilhosa da Serra and Messejana; Urania Cruise OBSs Mission (Aaugust 2008).
- Attendance of the 2nd Tsunami field Symposium
- Attendance of the Tsunami meeting in Cadiz, Spain and field work in Algarve
- Participation of Luis Matias to a work meeting in NOAA/PMEL, Seattle, USA

Consumables

- Materials used or worn out due to lab or field work (WP6)
- Computer's material (WP1)
- Acquisition of material needed for the installation of seismic stations (WP3)
- Nautical and topographic maps for DEM production (WP7)

Other costs:

- Costs concerning the recovery of the buoy in November 2007
- Compilation of bathymetry plus shallow bathymetry survey
- Costs related with processing of samples to obtain specific geochemical data, namely ages (e.g. 14C, OSL) or sedimentation rates (e.g. 210Pb), and paleoecological information, requiring facilities/skills not available at the proponent institution therefore requested abroad (France and USA).
- Acquisition of a personal computer required to store and process database emerging from the contracted work (depreciation cost).

There are no major deviations from the cost budget.

Contractor 3 CSIC

Activities performed

- WP1 CSIC completed the analysis of the sources due to slope instabilities providing to the WP1 leader the necessary data to be included in deliverable D2.
- WP2 Task 2.1 The CSIC activities concerning processing of MCS legacy data have been mainly concentrated on the processing of the SWIM-06 data acquired in June 2006. Mainly in the first semester of year 2, a total of 9 out of 16 SWIMM profiles (56% of the total) have been fully processed until PSDM. Moreover a velocity model for Kirchoff depth migration was performed in 9 MCS profiles (SW01-SW07, SW13 and SW16) with SIRIUS software by a depth-focusing error analysis of the MCS data. Finally a Kirchoff PSDM has been applied to these profiles using Seismos software package. Part of these profiles (the ones crossing the main active structures such as the Horeshoe fault and the most conspicuous lineation)

have been included as part of deliverable D4, a compilation of depth-migrated multichannel seismic profiles crossing potentially tsunamigenic structures in the area that was delivered in May 2008.

Task 2.2 CSIC started the formal preparation of the Wide-Angle Seismic cruise to be made in the Gulf of Cadiz (Nearest-Seis) between October 27th and November 13th, 2008. In particular since May 2008 CSIC worked for the definition of the best location of the different profiles to be shot in Nearest-Seis.

- CSIC made 7 presentations at international meetings regarding WP2 activities, and two papers at national magazines, and 1 in international magazine.
- A graduate student (Sergi Ventosa) had a Nearest-funded grant during which he has developed signal processing filters that will be used to process Nearest-Seis data.
- The CSIC acquired and built 17 OBS instruments in the framework of a Memorandum of Understanding for joint technological development between Scripps Institution of Oceanography (La Jolla, CA, USA) and UTM-CSIC signed in 2008. A Specific test-survey was designed to check the functioning and quality of the pool that were successfully tested during the Nearest-Seis a trials' cruise in August 2008.
- The technicians and engineers from the UTM have improved the airgun array and acquisition geometry to optimize the vessel gun and the available compressors capacities.
- WP3 Involvement of the team from TOPO-Iberia (ICTJA-CSIC) with their network of portable seismic stations in South Iberia to merge their dataset with the Nearest newly acquired data from OBS stations to carry out the seismological monitoring under AWI coordination.
- WP4 Collaboration in the deployment procedure and deployment cruise for the deep-sea platform GEOSTAR.
- WP5 The contribution of the CSIC has been in the processing and interpretation of the real time seismological data collected by the University of Granada observatory.
- WP6 Task 6.1 CSIC/UNED: The Team leaded by Javier Lario (UNED) and Cari Zazo (CSIC) completed the following tasks:
 - Planning and selection of sampling drilling sites to be recovered using a rotary corer to obtain a continuous core up to 30 m long in 2-3 stations of the Rio Piedras marshes.
 - New sampling drills recovering continuous cores up to 24 m in Rio Piedras (Huelva) with the participation of Cesar Borja, Francisco Borja, Ana Cabero, Javier Lario.
 - Study and interpretation of 3 prospecting wells acquired in Rio Piedras
 - Completion of the grain size analyses, geochemical analyses (XRF) and metals (ICP-Mass) of the collected cores: RP-11bis, RP-15, RP-16 cores.
 - Processing and interpretation of the data
 - Achievement of 8 new 14C dating (Beta Analytics, USA).

Task 6.2 From the period of the 18th February to 19th March 2008 CSIC opened, described and imaged (digital photo) five recently acquired sediment cores from the SW Iberian Margin which will be added to the turbidity paleoseismology model of the Gulf of Cadiz. Fifteen new piston cores have been obtained in the SW Iberian Margin during the RV James Cook 27 cruise (Atlantic Margin), 3 August to 3 September 2008, Santa Cruz de Tenerife to Portland (UK). Chief Scientist: R. Wynn (NOCS, United Kingdom). Digital imaging and visual core description was completed onboard. At least 8 cores are interesting to complete the marine synchronicity test and check the confluence test along the drainage systems for turbidite paleoseismology in the Gulf of Cadiz

- Meeting in NOCS, Southampton (United Kingdom), 19-20 June 2008. Assistants: CSIC (E. Gràcia, C. Lo Iacono). Invited talk in the Challenger Division for Seafloor Processes and presentation of CSIC results on turbidite paleoseismology in the Gulf of Cadiz.
- Visit to the BOSCOR Core repository and examination of the RV Discovery 98 cores collected on the Horseshoe Abyssal Plain (HAP, cores D-11948, D-11950), Tagus Abyssal Plain (core D-11951) and Seine Abyssal Plain (core D-11949).
- Preparation of the RV James Cook 27 cruise along the Atlantic (summer 2008), where several sites will be revisited and cored in SW Iberia. The plan is to work on a selection of their newly collected cores in order to complete the turbidity paleoseismology model of the Gulf of Cadiz.
- CSIC has made 8 presentations at international meetings regarding WP6 activities, one extended abstract, and five related papers at international magazines.
- Rio Piedras (Huelva) field work, October 6th to 20th 2007, organized and executed by UNED and CSIC (MNCN). The main objective was to obtain a continuous core in the Rio Piedras looking for sedimentological and paleoenvironmental evidences of tsunami deposits. Three wells were realized using a rotary drilling lorry.
- RV James Cook 27 sediment coring cruise (Atlantic Margin), 5 August to 3 September 2008, Santa Cruz de Tenerife to Portland (UK). Chief Scientist: R. Wynn (NOCS, United Kingdom). WP6 CSIC participants: Z. Rosselló, G. Bozzano. The cruise was devoted to sample the margin and basins from the Canary Islands to Whittard Channel Celtic Fan to the north. During the cruise, two days were devoted to sample sediments from the NEAREST interest area, recovering a total of 8 sediment cores are of interest for Task 6.2.
- WP8 The involvement of CSIC has been mostly to collaborate with FFCUL to establish the fault scaling parameters and methods to estimate the maximum earthquake magnitude that the active faults identified in the Gulf of Cadiz may generate.
- WP9 for website "Los Ecos Elaboration of information the new del Mar": http://www.utm.csic.es/ecos/ in which among other aspects of the application of marine acoustics in geosciences, we focus on geological hazards and in particular on the SW Iberian Margin. Web site launched in September 2008. Collaboration with a TV team of three journalists of German ZDF Station to allow their participatation aboard the BIO Hespérides in the Nearest-Seis cruise next October 2008
- WP10 General coordination of all activities carried out by CSIC within the project, participation to Steering Committee meetings, technical and financial reporting at 6-monthly level.

The CSIC organized the Nearest 18 month meeting in Barcelona, May 8th and 9th 2008.

Costs occurred

<u>Personnel</u> costs are slightly higher (~14%) than planned. The major items are the contracts of Sara Martinez, Alexis Vizcaino, and Zoraida Rosselló which have been working on MCS processing (WP2) and sediment core analysis (WP6). %.

<u>Travel</u> costs are 40% less than expected. The difference is mainly due to the delay on the marine cruises: a) the Nearest-seis seismic refraction cruise which is now scheduled for late October 2008; and b) the delay on the scheduling of the Nearest-core cruise. The main expenses within traveling and subsistence a due to Congress Inscription (2 at the MAPG in Marrakech including field trip; 2 EGU General Assembly in Vienna; 3 at the GNS meeting, and 1 at the Young Researchers in Earth Science in Oviedo, Spain) amounting 3052 euros. Concerning the traveling expenses these are referred to Marrakech (MAPG), Vienna (EGU) and London (NOCS meeting)

amounting 3843 euros, Two trips to Bremen (xrf scanning analysis) and to Kiel (IFM-Geomar to process data (prestack-depth migration) amounting 2710 euros, different trips for ship technical arrangements fro Nearest-SEIS survey (Cartagena, Lisbon, Toulon, Bolonia) amounting 4760 euros, and small trips for technical meetings amounting 925 euros

<u>Consumable</u> regards the UNED for planning and selection of sampling drilling sites to be recovered using a rotary corer by means of geomorphological mapping, study and interpretation of numerous prospecting wells, grain size, micro and macrofauna analyses, etc. Level of expenditure in this cost category are in the similar situation as the travelling, with a reduction down to 50% of the expected, and the reason is that most of the consumables were for the NEAREST-SEIS marine wide-angle seismic experiment, which as was mentioned is delayed till late October 2008, as well as the NEAREST-CORE MCS cruise, which still has not been programmed.

<u>Indirect costs:</u> actual indirect costs are higher due to a major incidence with respect to the personnel costs 158% (instead of 138%)

Major Deviations

Regarding person/month CSIC sustained an important supplementary effort in particular with reference to Workpackage 2 and 6, up to 47 person/months.

The involvement of CSIC within NEAREST by all means is rather strong, in terms of data acquisition, data analysis, data processing and modeling, particularly in Wp's 2 and 6. We realize that to be on time for the subsequent experiment and significant effort should be made, otherwise the amount and the slowness of laboratory tasks will certainly delay the critical offshore experiments. For this reason we were forced to increase the personnel dedicated to these tasks.

Statement related with the activities in these two workpackages:

- WP2 (Task 2.1): In this WP it was decided to process some MCS reflection lines using the prestack depth migration processing tool, before the offshore refraction experiment initiates, because this information is a key element to design and carry out the offshore refraction survey. Due to the heavy job and time consuming, we contract Sara Martinez to achieve this job at full time contract, i.e.12 man/month.; Moreover, Sergi Ventosa grant, who has worked on signal processing filtering adapted to OBS data (for Nearest-Seis cruise). The performed tasks are the following:
 - Time and depth migration of selected MCS profiles using specific software available in GEOMAR Kiel, Germany.
 - $\circ\,$ Seismostratigraphic interpretation from those mentioned profiles using the Kingdom Suite.

Compute the amount of active faults displacement within the Gulf of Cadiz.

• WP6 (Tasks 6.2, 6.3): In this second year we got new samples to be analyzed which require a substantial time to do it properly due to the slowness and difficulties of the process at the laboratory. For this reason we contract two persons, Zoraida Rossello y Alexis Vizcaino, consequently the task force amounts to 23 man/month.

The performed tasks are the following:

- Opening and description of the marine samples acquired in the Gulf of Cadiz.
- Granulometric analysis at the sedimentology laboratory.
- Analysis of Physical and chemical properties of the marine sediments ((Multi Sensor Core Logger) using sedimentary phase's identification.
- Dating and age calibration of 14C using OxCal of a selection of marine sediment samples. Stratigraphic correlation and construction of a dated model. Correlation with tsunamites events.
- Interpretation of TOPAS high resolution seismic profiles and computation the amount of active faults displacement.

 Integration of results with the paleoseismic data base from SW of Iberia and computing recurrence intervals.

Contractor 4 AWI

Activities performed

- WP2 AWI provided contribution to the planning and identification of the target of wide-angle seismic profiles within the NEAREST-Seis cruise. Morevorer they took care of the construction of 1D seismic velocity profiles at OBS positions (together with UBO).
- WP3 After having successfully deployed the BB-OBS in the Gulf of Cadiz, AWI concentrated its activities in preparing and implementing the processing of BB-OBS data. Main activities consisted in testing, modifying or rewriting programs and scripts, and making test runs with the short data set retrieved from the 2-days deployment. AWI coordinated the activities carried out by the other Nearest partners involved in WP3 and elaborated the OBS recovery report.
- WP4 AWI carried out the processing of data recorded by OBS-07 close to GEOSTAR observatory to test the functionality of the deep-sea platform.

Test of release unit of GEOSTAR buoy mooring was carried out during the cruise in November 2007. Cruise reports on OBS deployment Nov. 2007 was elaborated as well (see annex to Deliverable D15b)

- WP5 Together with the partners AWI investigates the distribution of land stations around the research area, which are not part of the Nearest project, and checks their data availability. Having this information we will try to access them to enlarge the seismological data base for our study.
- WP9 AWI presented the project in the conference of the German Geophysical Society 2008 and the Workshop of German Seismologists in 2007.

AWI established contacts with German TV teams which documented the OBS/GEOSTAR recovering August 2008 and will participate in the NEAREST-Seis cruise in October 2008.

WP10 AWI participated to all Nearest plenary meeting, to Steering Committee meeting and produced management reports.

Costs occurred

<u>Personnel:</u> The costs refer to the following scientist recruited for the project: Dr. Wolfram Geissler. Period of activation: 01/10/2007-30/09/2008 -Main task: mainly fulfilling the tasks in WP3, WP4 and WP5

Subcontracting:

- 2 external technicians from KUM Kiel, necessary for the proper deployment of the 24+1 OBS during the cruises in August/September and November 2007
- 2 external technicians from KUM Kiel, necessary for the proper recovery of the 24 OBS during the cruise in August 2008
- Hire of stevedores, crane, and forklift and agency assistance during preparation of OBS deployment in 2007

<u>Travels</u>

- W. Geissler/X. Li. OBS deployment cruise, Faro-Faro/Portugal 22.08.-07.09. 2007
- W. Geissler. Annual Nearest meeting, Marrakech/Morocco 25-26 October 2007
- W. Geissler. 2nd OBS deployment cruise, Portimao/Portugal, 22-28 November 2007

- W. Geissler. Training on OBS recovery, Oristano/Sardinia, 04-15 December 2007
- W. Geissler/W. Jokat. Nearest meeting, Barcelona/Spain 08-09 May 2008
- Geissler/Feld/Romsdorf/Unglert. OBS recovery cruise, Palermo(I)-Faro(P) 29.07.-17.08.2008

Consumables:

Anchor, batteries and other consumables necessary for the deployment of the 24+1 OBS

Other costs

- Transport/mobilisation of 24 OBS and equipment deployment cruises in 2007
- Storage costs for 24 OBS in Faro before deployment
- Transport/demobilisation of 24 OBS and equipment recovery cruise in August 2008.

Equipment

- Hard disk to archive raw and converted OBS data

Contractor 5 UBO

Activities performed

- WP1 Additional data on the seafloor morphology in the southern Gulf of Cadiz (offshore Morocco) were acquired during a brief transit/cruise (following the MicroSystems cruise, Reson Multibeam, R/V Marion Dufresne. July 2008). These data image the morphology of the deep Moroccan margin (salt domes, horsts/basement highs, the southern Rharb submarine valley). Older bathymetric data from the shallow Moroccan shelf (a contoured bathymetry map from Vanney) have been digitized and are also available as well. Field work was performed in Morocco (3 days in March 2008) to investigate active faults in the NW Moroccan onshore region and the possibile link to active structures observed offshore. A dark gray sedimentary layer (possible lagoonal or tsunamigenic deposit with shell fragments) at 30m elevation near Moulay Bousselham was investigated as well.
- WP2 Active seismic/velocity model : Wide angle data acquired during the Sismar cruise (April 2001) are available for the Nearest project. A. Gailler (Nearest post-doc) has begun reprocessing of unpublished OBS line SIS-13 (crossing the eastern the Gulf of Cadiz in a N-S direction).

Using the database of existing marine reflection seismic and refraction profiles in the study area a 3-D crustal model was established and presented in the form of four maps (depth to basement, sediment thickness, depth to Moho, crustal thickness). These maps were presented at the MAPG meeting in Marrakech (Oct. 2007) and submitted for publication to a Special volume of Tectonophysics. The MS has been accepted pending minor revisions (and will be revised in Oct. 2008). New HR (sparker) seismic data acquired in July/Aug 2007 in areas of active faulting on the SW Spanish and NW Moroccan platforms (R/V Cote de la Manche, PI P. Leroy, participants J. Begot, M-A Gutscher, N. Babonneau) are being interpreted with seismic interpretation software (Kingdom Suite). This work is being performed as part of a PhD thesis (Nissrine Maad).

Planning of the Oct./Nov. 2008 Nearest-OBS cruise incl. preparation/transport of the 19 OBS from the Ifremer/UBO pool and necessary technical personnel.

WP3 Seismological monitoring: The initial results of the 12-month deployment of Broad-band ocean-bottom seismometers (AWI-Bremerhaven) on the sea-floor, were discussed with L. Matias (FFCUL) during a meeting in Liverpool. A list of 10 potentially interesting (unusual) earthquakes recorded by land-based networks during this period was compiled (by M.A. Gutscher).

WP6 Paleotsunami and paleoseismic records: Five sediment cores (35 m cumulative length) acquired during the DelSis cruise (R/V Suroit April 2005) were analysed (x-ray and density logs, sedimentological analysis) and dated (biostratigraphic dating, C14 dating). This work was performed by N. Babonneau (in collaboration with T. Mulder, and E. Gonthier, Univ. Bordeaux).

Field work was performed in NW Morocco (P. LeRoy, B. VanVliet Lanoe, N. Maad, M-A Gutscher) and SW Portugal (B. VanVliet Lanoe) to identify onshore tsunami deposits. The gray sedimentare deposit with shell fragments (from Moulay Bousselham) was dated using C14.

WP10 Attendance at the management meetings and workshops.
 Nearest Workshop and Management Meeting in Marrakech Oct. 2007 (N. Maad).
 Nearest Workshop in Rabat in March 2008 (M.A. Gutscher)
 Workshop and Management Meeting in Barcelona May 2008 (M.-A. Gutscher)
 Management and financial reporting-

Cost occurred

<u>Personnel:</u> UBO staff has been involved in 4 of the workpackages, with the majority of the effort spent on WP1 and WP2. Starting 1 April 2008 a post-doc was hired within the Nearest project. From 1.04 - 31.08.2008 Boris Marcaillou was employed. Following his departure (for a permanent Lecturer position at the Univ. Guadeloupe) Audrey Gailler was hired starting 1.09.2008.

<u>Travels</u>

Pascal Le Roy, Nissrine Maad and M-A Gutscher attended the international Geological Conference MAPG Meeting in Marrakech (28-30 Oct. 2007).

M-A Gutscher attended a Paris Workshop (26-28 Feb. 2008) on research in the greater Mediterranean region and presented the preliminary results of the Nearest Project.

Nissrine Maad and M-A Gutscher attended the Nearest Workshop held in Rabat and ensuing field trips in NW Morocco (Lalla Zara - Moulay Bousselham - Larrache region) (26-30 Mar. 2008).

F. Gallais (Masters student) participated in a seismic cruise onboard the Research Vessel Urania on a related tectonic region (Calabrian Prism) offshore S. Italy in mid-April 2008.

M-A Gutscher and Boris Marcaillou (post-doc) attended the 18-month Nearest Meeting in Barcelona (8-9 May 2008).

Contractor 6 INGV

Activities performed

- WP3 After the recovery of the GEOSTAR observatory a preliminary analysis on seismic data has started (month 23) to check data completeness and quality. An agreement with WP leader was reached for the GEOSTAR data integration in the OBS data-set and for the OBS data analysis in order to assess the local seismicity in the period of the pilot experiment.
- WP4 In October 2007 an extraordinary mission to the GEOSTAR deployment area was organised and performed by INGV in order to re-install the electronics of the buoy, dismounted at the time of the deployment mission (Aug 2007) because of malfunctioning, and the newly calibrated acoustic communication system. After an automatic alarm message related to the buoy drift was sent by ARGOS system (satellite monitoring system of the buoy position) to INGV, an other extraordinary cruise was urgently arranged with the support of FFCUL and INGV by renting a ship of opportunity taking advantage of the buoy satellite communication and GPS positioning, the buoy drift was real-time tracked and in less than 24 hours the buoy was reached. Once reached, the buoy was hooked, and successfully towed back to Lagos harbour.

The cruise for GEOSTAR and the buoy mooring recovery took place in August 2008 (month 23) thanks to the allocation of ship-time of the R/V Urania to the NEAREST project upon request submitted by ISMAR. Transportations and embark on the Urania R/V of the cable-winch system and of the MODUS vehicle were performed in Italy.

A coordinated team including MODUS operators, winch operator and ship crew, successfully completed the observatory recovery operations. Successively, the mooring line recovery operations started and completed without major problems.

The observatory, buoy and the recovery vehicle and tool were either transported or despatched to the corresponding partners premises (Italy, Germany).

On month 24 just after the end of the recovery cruise, data back up and quality check has started. The first analysis shows that the observatory acquired and stored all the data as expected from August 2007 (month 11) till July 2008 (month 22).

The planning of a complete and detailed check/maintenance of sensors and devices has been elaborated based also on the data quality check analysis of the pilot experiment data, in order to fix the problems occurred. Meanwhile the necessary actions for the development of an extension of the pilot experiment in 2009 were started.

- WP7 A theoretical model was developed by INGV together with ISMAR in order to study the mechanism of coupling between the seafloor motion and the induced disturbance in the water column. Preliminary results were presented in the NEAREST Barcelona meeting in May 08. A 2D model which describes tsunami generation and propagation in a compressible water model with a porous seafloor bottom was developed and preliminary results submitted to JGR.
- WP8 INGV took part to the pilot experiment which has proved the correct operation of the automatic data pre-processing procedure of the software component of the EWS prototype.
- WP9 Circulation of information on the project and the pilot experiment were promoted by INGV in international meetings through oral presentations, posters, booklet, leaflet.
- WP10 Reports for the documentation of the management activities were elaborated. Participation to project plenary meetings was assured.

Costs occurred

Personnel: researchers involved by INGV in the project activities

<u>Travel</u>: refers mainly the personnel involved during the various trips to Portugal for all the extraordinary attempt to recover the buy and for the recovery of the observatory in August 2008.

<u>Other Costs</u>: all costs sustained for services and transportation linked to the recovery cruises and of warehouse lease to store the buoy.

Contractor 7 TFH

Activities performed

- WP4 After the 2007 deployment cruise, TFH took care of improvement and adjustment of the sonar levelling system for MODUS, including:
 - interfaces, gyro, layout of the control, pre programming, test in the lab, safety modes;
 - telemetry update, exchange of components, testing in the lab;
 - check of MODUS, repair, maintenance and exchange of components for safety reasons.

Finally TFH took care of the preparation of MODUS changing components of the coupling, the light control, the sonar control software update and backup video multi channel system for logging the operation of MODUS during the deployment, search, survey and recovery phase. The new system is on digital basis and helps to speed up the visual processing of the operation and with that the understanding of the operation, to improve it. For this the personnel from TFH Berlin were involved (Reinhard Wolter, Wilfried Langner, Hans Gerber) receiving support from the partner TU Berlin in person of Haiko de Vries who was partner in development of the "soft" parts of MODUS.

TFH participated to the MODUS recovery operation in August 2008. The system check afterwards gave no indication of damage on the fibre lines. ODTR measurements have been conducted for this. The results showed the same situation as before the dive. In consequence there is no increase of dB-loss because of damage due to operational procedures during this dive. Nevertheless, the consumption of the budget happened, this likely to the increase of tension in the cable and eventual to the bending at the termination with the loose bending restrictor, which only can be assumed but not confirmed. Before diving again all FO-connectors were cleaned and reconnected. Dive 2 could be performed and the station has been recovered successfully.

The log files from the deployment cruise in August 2007 have been processed.

During the recovery dive, different effects have been monitored. The entire data set and the cable have been investigated carefully. Check up with the manufacturer led to some proposed modification on the termination, Esbjerg 09.2008 at MacArtney.

The set up of MODUS took place on the URANIA while being in the harbour of Faro. For the set up Haiko de Vries from TU Berlin came to assist and cross check the electronics and controls

- WP8 Planning of the cruise, logistics, participation of the recovery cruise. Set up of MODUS on board, check on board, deployment of GEOSTAR. Performance tests in the sea of all components including the new ones.
- WP10 Contribution to presentation for the meetings, coordination of work, logistics, reporting. Preparatory work for the organisation of the second annual meeting to be held in Berlin in October2008

Costs occurred

<u>Personnel</u> costs refers to experts engaged by TFH to work on the project. Due to changes in public contracts the amount is slightly higher than initially foreseen.

<u>Travel costs</u> refers to 3 persons from Berlin to Faro and return to participate to the recovery cruise the August 2008 starting in Faro.

<u>Consumables</u>: Digital recorder for extended diving documentation, components and material for exchange of components of MODUS, for a safe operation

Other costs: Transportation of the equipment from the site to Berlin.

No major deviations.

Contractor 8 UGR

Activities performed

WP3 All activities, preliminary results and results obtained in this workpackage are related to the seismic monitoring of mainland (Portugal, Spain and Morocco) data.

- Luisa Buontempo is studying of the seismic anisotropy by using teleseismic phases SKS recorded at 16 seismic stations of South Spain and north of Africa. Seismic anisotropy reveals the preferable propagation velocity patter in the upper mantle-astenosphere as due to a flow in this region of the Earth interior and can be a fundamental tool to retrieve information of the geodynamic scenario.
- Seismic anisotropy by using teleseismic phases SKS recorded at 16 seismic stations of South Spain and north of Africa has been obtained. The polarization direction and delay time for each seismic station were calculated. The area of interest extends across two important geological structures: Iberian foreland and Gibraltar arc. *Luisa Buontempo and José Morales.*
- Shear-wave splitting measurements from stations in the Betic domain show homogeneous ENE-WSW fast directions nearly parallel to the trend of the mountain belt, and smooth spatial variations. Along the Gibraltar arc, UGR observed a smoothly varying trend changing from ENE-WSW in the Eastern Betics to NS in the area of Gibraltar and Ceuta, following more or less the general trend of the mountain belt around the Alboran sea, and the coastline. Since a similar rotation is also visible in results from Pn anisotropy, this suggests that the anisotropy is vertically coherent starting from just below the Moho. *Luisa Buontempo and José Morales.*
- The results has been published in the ISI journal "Earth and Planetary Science Letters" as: Buontempo, L., G.H.R. Bokelmann, G. Barruol and J. Morales (2008) "Seismic anisotropy beneath southern Iberia from SKS Splitting" vol 273: 237-250. Luisa Buontempo and José Morales.
- Flor Mancilla has worked with teleseismic data recorded at inland station in Portugal Spain and Morocco to estimate receiver functions and define better the crustal and upper mantle structure in the Gibraltar arc. A stage at stage at GeoForschungsZentrum Potsdam is now developing by *Flor Mancilla*.
- Preliminary results of Moho depths and receiver functions in the Gibraltar Arc have been presented at EGU meeting. *Flor Mancilla* and *José Morales*.
- A revision of the seismicity in the Gulf of Cadiz in the period between October-2007 to March 2008 was made in order to select suitable earthquakes to proceed with the regional inversion of the moment tensor. *Daniel Stich and Jose Morales*.
- The earthquake (2008 January 11th Mw=4.4) was eventually selected for inversion procedure. The selection was made using by the following criteria: number of broad band seismograms with enough azimuthal coverage and enough signal/noise ratio at 20-50 s period band. Selection and collection of the seismograms has been made *by Daniel Stich and José Morales.*
- Preliminary inversion of the faulting parameters for the January 11th 2008 earthquake gives a reverse faulting and a depth around 35 km. *Daniel Stich and Flor Mancilla*.
- Flor de Lis Mancilla, forward model the direct and depth phases for the above mentioned earthquake in the Gulf of Cadiz: P, pP, sP, pwP and swP phases (the latter are the water P-

wave reflections at the sea surface), performing a source-depth grid search in steps of 5 km. Teleseismic seismograms has been selected to perform the modeling. Preliminary results also show upper mantle depth for this earthquake.

- WP4 Interchange information with INGV on ground motion level expected in the seismograms recorded by the sea-floor GEOSTAR platform during the deployment in the Gulf of Cadiz according with the seismometer characteristics of the equipment. *José Morales*
- WP5 IAG-UGR installed a new prototype of data-collector in the IAG headquarter. After October 2007 Marrakech meeting the IAG-UGR group has been carrying out tests installing new data-collector based on the SEEDLINK/SEISCOMP technology implemented on a Linux platform. Jose Benito Martín
 - At this time data concentrator is working at IAG-UGR since January 2008 and it is collecting waveform data from broadband station deployed in Spain, Portugal and Morocco belonging to the follow networks: GE, IU, MED and PM: Portugal (PESTR, PVAQ and MTE) Spain (PAB, SFS, MELI, CART) and Morocco (RBT). *José Benito Martin and Antonio Martos*.
 - In order to collect also the data from IAG-UGR broad band seismic network (IG network) under the SEEDLINK/SEISCOMP platform server, the acquisitions system of the seismic field stations is changing in a progressive way. Checking and testing has been undertaken in order to find the best configuration of the acquisition software under a Linux platform allowing real time transmission with the SEEDLINK server. Antonio Martos.
 - Preliminary testing was performed, allowing transmission for the seismic station linked by DSL lines with the SEEDLINK server. *Antonio Martos*.
 - The prototype version of the data concentrator Seiscomp 3.0 was installed. *J.B. Martín, Antonio Martos, Jose Manuel Navarro.*
 - A training course on SEISCOMP 3.0 in Barcelona was made by J.B. Martín, Antonio Martos and J. Morales
 - Gradual change was made in the system of acquisition of the brad band seismic stations to be linked with data concentrator Seiscomp 3.0. At this moment broad band seismic stations has been changed to Seiscomp 3.0 data concentrator format (ARAC, SESP, GORA and HORN). *Antonio Martos.*
 - Two important data of the seismic source have been investigated: *depth and faulting parameter* of the earthquakes in the region.
 - *Flor de Lis Mancilla* is has started a stage at GeoForschungsZentrum Potsdam to test the possibilities of "Autoloc" as a fast earthquake location procedure.
 - Estimation of a crust and upper mantle structure to simulate a realistic large earthquake according with focal mechanism and depth of the seismic activity in the region. *Daniel Stich and Flor Mancilla*
 - The early warning system prototype based on the SEISCOMP 3.0 technology installed in the IAG-UGR was used to start to evaluate fast earthquake location parameters of the seismic activity of the region. *José Morales, Jose B. Martin.*
 - The prototype was also used to start to estimate fast magnitudes (mb, Mw, Mwp, etc) of the earthquake activity. *José Morales. José B. Martin.*

- The SEISCOMP 3.0 in now running in a preliminary version and fast location and magnitude evaluation was made by the system with positive results. Example of large earthquakes like the Sichuan (China) Mw=8.0 in May 2008 was located at magnitude evaluate in seven minutes after origin time. Very fast evaluation is calculated when the density of seismic stations is high. *José Morales.*
- WP7 Collaboration with FFCUL in the definition of dynamic and static seismic source parameters of the earthquakes located in the Gulf of Cadiz in order to define a realist simulation of tsunamigenic earthquake. *Daniel Stic, Flor Mancilla and José Morales*.
- WP9 Information of the project in Topo-Iberia meetings projects in order to look for possible relationships with Nearest project. *José Morales*
 - Information of the project (brochures and direct information) has been directed to the regional civil protection authorities during joint meetings between Spanish Civil Protection-UGR. During this meetings UGR informed of the advances in the real time location of the earthquake activity SEISCOMP 3.0 platform developed in the Nearest framework and the rest of the activities related with the tsunami simulation and detection. *José Morales*
- WP10 Management activities related to WP's 3, 5, 7, 8 and 9 have been carried out by Jose Morales with the assistance also of Flor de Lis Mancilla.
 Coordination activities on the WP5, having UGR as leader (José Morales).

Costs occurred

<u>Personnel cost</u>: 12 moths of the contract of Flor de Lis Mancilla (1 October 2007-30 September 2008) for collaboration in WP3, WP5, WP7, WP8 and WP10)

Travels:

- Jose Morales, Daniel Stich, Flor de Lis Mancilla and Jose B. Martín -Annual Nearest meeting, Marrakech 25-26 October 2007.
- Jose Morales, Daniel Stich, Flor de Lis Mancilla and Jose B. Martín 3rd Nearest meeting, Barcelona, 8-9 May 2008.
- Jose Morales, J.B. Martín and Antonio Martos, participation in the training course on SEISCOMP 3.0 organized in Barcelona by ORFEUS. 5, 6 and 7 May 2008.

<u>Consumables:</u> Material to proceed with the change in the data acquisition in the seismic stations and to install the prototype of the early warning system.

Contractor 9 IM

Activities performed

In this reporting period, IM has developed work on WP3, WP5, WP8, WP9 and WP10.

- WP3 IM has collected and reported all parametric data regarding seismic activity detected by the inland Portuguese national network in the vicinity of the OBS deployment area. These data will be used to compare and merge with OBS data.
- WP5 IM has developed the prototype of a data concentrator already running since year 1. Such prototype is recording in real-time data from several seismic stations of Southern Portugal, Spain and Morocco. Moreover, major developments have been made on the software used for detecting, associating and locating allowing now fast earthquake determinations with human check.

In order to improve the real time magnitude evaluation for large earthquakes, a new release of the Seiscomp software (version 3) has been installed in a different hardware, integrating also a lot of new stations from all the Atlantic region (about 100 stations). This "virtual" network could be the seismic network core for a NE Atlantic regional tsunami warning center.

Efforts have been taken in order to integrate data from three tide gauges located at Cascais (near Lisbon on the western coast of Portugal Mainland), Lagos (in the south-western coast of Algarve) and Sines, located between San Vincent cape and Lisbon. Data from Cascais have already being acquired and integrated within the system, but the sample rate issue has not been solved yet, due to unexpected delays in performing the upgrade of the instrumentation. Lagos tide gauge integration was also delayed, but the technical solution is already defined. For Sines tide gauge, communication tests have been performed, but data link is not yet established. Ongoing efforts to integrate tide-gage stations from Azores have also been carried out.

- WP8 IM has collaborated in the preparation of the data concentrator to receive synthetic information in order to test the prototype. Those tests could be performed on the already referred Seiscomp 3 platform. IM as well prepared a cooperation with Joint Research Center in order to implement a database of pre-computed tsunami propagation scenarios, adapted to the expected tsunamigenic source area.
- WP9 IM presented the Nearest project in a number of national and international workshops, particularly on the 1st Meeting of the Task Team for the Establishment of the Regional Tsunami Warning Centres for the NorthEast Atlantic. In and Mediterranean Tsunami Warning System, January 2008

Moreover IM arranged a visit to Joint Research Center (JRC), in order deal prepare a collaboration with JRC aiming the establishment of a Portuguese Tsunami National Warning Center, March 2008, Ispra, Italy.

Finally A Press release to Portuguese media as been prepared, reporting the IM activities in the tsunami detection, where NEAREST project as been highlighted.

WP10 IM took care of the general management of the project, coordinating internal activities, participating in Nearest plenary meetings and preparing reports in due time.

Costs occurred

<u>Personne</u>l: These costs correspond to the salary of young researcher who has been working on several tasks of the project.

<u>Travels:</u> participation of Fernando Carrilho to the Nearest plenary meetings and Steering committee meetings that took place Barcelona (May 2008). Participation of Fernando Carrilho in the preparatory session of the Working Group 2 of the North-East Atlantic and Mediterranean Tsunami Warning System (NEAMTWS) that occurred in Rome [October 2007], on the 1st meeting of the Task – Team for the establishment of the Regional Tsunami Warning Centers that took place in Paris [January 2008] and a visit to Joint Research Center at Ispra [Marh 2008].

Contractor 10 CNRST

Activities performed

WP1 Two main actions were carried which were discussed with the WP1 group leader in order to integrate these results in the newly developed map:

- Geodynamic Evolution of the Atlantic Margin Basins of Morocco
- Reconnaissance geology in the region of My Bousselham

New field investigations were undertaken in the area between Sidi Allal Tazi and Moulay Bouselham (North Western Morocco). These investigations revealed the existence of important neotectonic features.

WP2 New investigations about Historical Tsunamis, based on historical seismicity data, have been carried out in the reporting period. A newly compiled catalog of these seismic events is ready to be integrated in the NEAREST database.

Ongoing thesis-work developed by KAABOUBEN F.), who benefited from a double Moroccan-Portuguese advising, allowed to bring new elements to the existing Moroccan seismic data.

WP3 Geological field reconnaissance has been carried out for the site selection for the installation of a mobile seismological network in Lalla Mimouna Hills, Northern Morocco.

Based on the geological reconnaissance conducted in the area of Moulay Bousselham, the CNRST, in collaboration with the central and local authorities, took the initiative to set up a network of four three-components seismic stations of the Lennartz MarsLite type. These have been installed at:

•	Station Oulad Ayyad Bahara:	(BOA):	N 34 ° 47.225 W 6 ° 10.188
•	Station Oulad Sinane:	(OSN):	N 34 ° 41.750 W 5 ° 52.918
•	Station Boubker Sidi El Haj:	(SBEH):	N 34 ° 55.627 W 6 ° 03.411
•	Station Chouafaa:	(CHF):	N 34 ° 57.786 W 6 ° 07.778

This sub-network of four stations completes the stations of the national seismic network within the NW of Morocco. The Lalla Mimouna sub-network started recording data in September 2007. The stations of this sub-network run on a triggering basis. Periodically, once a month, the network is inspected for maintenance and for seismic data recovery.

Geological field reconnaissance has been carried out also for the installation site of a Broad Band station in The Sidi Ifni Precambrian shield, Anti Atlas, Southern Morocco.

Oceanic velocity Model of the lithosphere offshore Morocco was deduced from seismic data.

Several field trips have been arranged to assure maintenance and of seismic data recovery, involving scientists, engineer, technical and driver staff (KASMI M., EL MOURAOUAH A.)..

WP5 Concerning task 5.1 (establishment of 3 data collectors in Portugal, Spain and Morocco), the data collector installed since May 2007 in Rabat was equipped with SEISCOMP 2.5 software implemented on an Intel/Linux platform.

Regarding Task 5.2 (Waveform sharing between data collectors), data have been exchanged between CNRST-Rabat and IM - Lisbon since 20/5/08.

Concerning Task 5.3 (Integration of tide gauge data) the CNRST decided to acquire and install one tide gauge in Morocco. The order is already done.

Several field trips have bee organised for prospecting for a new site to install a new digital tide gauge.(BIROUK A. EL MOURAOUAH A.)

WP6 Fieldwork in the NW of Morocco, two main activities were undertaken:

• Identification of suitable site and sampling of deposits in the coastal lagoon of My Bouselham and in the estuary of Loukos (Larache);

• Introduction of new neotectonic observations in the area between My Bouselham and Larache, Northern Morocco.

New Geophysical and Geological Work on Recent Active Faulting in the Dhar Doum area, Western Coastal of Morocco

Organization of a Specific NEAREST Workshop in Rabat (March 2008).

WP7 The contribution of the Moroccan partner to Modelling of tsunami impact in SW Portugal, consisted as a first step in making models on the most populated areas in Morocco around Casablanca and Rabat. This work was carried out in collaboration with the Portuguese NEAREST partner in Portugal, by a Moroccan PhD student (OMIRA Rachid) proposed by the Morocco NEAREST Group. The results of this work were presented during in Marrakech during the NEAREST annual Meeting held in October 2007.

The Moroccan team has initiated a new study, using a different approach concerning the "vulnerability assessment: methodology and preliminary results".

- WP9 The CNRST, aware of the importance of increasing the awareness of the authorities responsible for the management of natural hazards, initiated a large-scale operation which aimed in first of all to conveying information to the different Moroccan departments on tsunamis risk, asking for their contributions to:
 - the establishment of the Lalla Mimouna seismic sub-network around the region;

• prospecting for a new site for the installation of a Broad-Band seismic station in Morocco;

• participation to the NEAREST meetings held in Morocco: Marrakech(Oct 2007) and Rabat (arch 2008) meetings;

- provide data of interest to NEAREST;
- allow access to different ports which may provide field observations relevant to the $\ensuremath{\mathsf{NEAREST}}$
- WP10 Preparation of annual and six- monthly reports, participation to plenary meetings and to Steering Committee meetings, coordination of project activities in Morocco project. Organization of the First NEAREST Annual Meeting in Marrakech (October 2007).

Costs occurred

<u>Personnel</u>: costs refer to research scientists and technicians of CNRST involved in the project tasks.

Travels: Participation to CNRST staff to

- Nearest specific workshop held in Rabat in March 2008;
- Mission to Lalla Mimouna for data retrieval and maintenance;

- Nearest field trip in North- West Morocco for investigations on sampling costal deposit and neotectonic

- Nearest mid-year plenary meeting in Barcelona (May 2008)

Moreover expenses for hosting the Nearest first annual meeting in Marrakech in October 2007

Consumables: PCs, printers and computer supplies

Major deviations

Considering the participation of the CNRST in the NEAREST project, it can be pointed out that indeed they have already spent far more than was initially expected in the first 2 years. This is mainly due to the fact that after the geological investigations in the Lalla Mimouna region, CNRST

decided to deploy a temporary seismic network in the region in order to check if there is any potential seismicity that they can correlate to the geologically observed faults. Consequently, this introduced large expenses and additional man power effort, which were not initially foreseen. Nevertheless CNRST would like to assure you that the remaining CNRST activities foreseen by the project will be fully performed and that considering their scientific interest in the Nearest project, the CNRST will sustain the extra costs, exceeding the EC contribution for the remaining part of the project.

Contractor 11 XISTOS

Activities performed

WP8 Activities performed by Xistos in year 2 are related specifically to Task 8.2 Development of a simulator for the decision-maker authorities, namely a crisis management tool that will allow the user to estimate the human, environmental and economic consequences that occur in the area affected by a destructive tsunami. During the second year of the project a new set of functionalities was developed and integrated in the Simulator, while the older functionalities suffered a general upgrade. These new and updated tools allow the different decision levels of the Civil Protection authorities from the concerned countries to manage the tsunami catastrophe, from a global and synthetic view of the field and also simulating the access of critical information from the disaster area, which is crucial for the process of good decision-making. Among the different functionalities we emphasize the ability to make a zoning of the disaster area in terms of tsunami inundation and the consideration of the domino effect on critical facilities, like additional incidents in coastal industries or harbours, triggered by the tsunami.

State of the art in the development of the simulator have been presented to the Nearest partners was shown during plenary meetings.

WP10 Technical and financial reporting, participation to the Barcelona plenary meeting in May 2008

Costs occurred

Personnel: Xistos staff employed for simulator development.

Major Deviations

Although the main part of the work in charge of Xistos was completed in year 1, consuming almost all the budget initially foreseen for the project, Xistos continued to develop new set of simulator functionalities (additional incidents in costal industries) sustaining additional personnel costs during the second year. The extra costs will be supported by the company Xistos itself.

TABLE 3

	Cost Budget Follow-up Tak													
Contract N		date	13/11/2008											
Participants	Type of expenditure (as defined by participants)	budget		Actual cos	ts(Euro)		% spent	remaining budget (Euro)						
			period 1	period 2	period 3	total	total							
		е	а	b	с	e1	(a+b+c)/e	e-e1						
1 ISMAR	total person- month	111,00	51,00	32,00		83,00	75%	28,00						
	personnel costs	493.950,00	229.721,19	134.410,72		364.131,91	74%	129.818,09						
	subcontracting	64.000,00	30.000,00	12.000,00		42.000,00	66%	22.000,00						
	travels	37.489,59	19.737,37	15.003,24		34.740,61	93%	2.748,98						
	consumables	64.000,00	33.715,07	5.744,04		39.459,11	62%	24.540,89						
	indirect costs	420.351,45	181.354,74	106.990,93		288.345,67	69%	132.005,78						
	other costs	21.000,00	15.000,00	-		15.000,00	71%	6.000,00						
	Total Costs	1.100.791,0 4	509.528,37	274.148,93		783.677,30	71%	317.113,74						
2 FFCUL	total person- month	102,00	34,00	29,58		63,58	62%	38,42						
	personnel costs	101.796,00	43.121,63	34.008,86		77.130,49	76%	24.665,51						
	subcontracting	34.500,00	2.300,00	4.833,30		7.133,30	21%	27.366,70						
	travels	46.296,17	15.778,43	38.045,02		53.823,45	116%	- 7.527,28						
	consumables	35.615,00	2.131,58	9.768,47		11.900,05	33%	23.714,95						
	indirect costs	68.640,43	25.277,75	28.592,05		53.869,80	78%	14.770,63						
	other costs	159.495,00	65.357,13	61.137,93		126.495,06	79%	32.999,94						
	Total Costs	446.342,60	153.966,52	176.385,63		330.352,15	74%	115.990,45						
3 CSIC	total person- month	74,00	27,80	55,00		82,80	112%	- 8,80						
	personnel costs	240.500,00	66.439,25	134.151,45		200.590,70	83%	39.909,30						
	subcontracting	6.000,00	-	-		-	0%	6.000,00						
	travels	41.158,24	10.896,27	15.289,79		26.186,06	64%	14.972,18						
	consumables	110.000,00	25.445,00	29.935,94		55.380,94	50%	54.619,06						
	indirect costs	377.585,00	91.686,17	211.959,29		303.645,46	80%	73.939,54						
	other costs		-	-		-								
	Total Costs	775.243,24	194.466,69	391.336,47		585.803,16	76%	189.440,08						
4 AWI	total person- month	36,14	10,75	18,00		28,75	80%	7,39						
	personnel costs	216.059,33	48.924,62	82.757,13		131.681,75	61%	84.377,58						
	subcontracting	80.000,00		59.373,58		59.373,58	74%	20.626,42						
	travels	13.104,26	3.976,83	10.592,30		14.569,13	111%	- 1.464,87						
	consumables	105.500,00	529,97	66.721,09		67.251,06	64%	38.248,94						
	indirect costs	83.932,72	25.336,28	39.202,79		64.539,07	77%	19.393,65						
	equipment			87.50										

	Contract N 37110 Acronym NEADEST data 10/11/000													
Contract N	37110	Acronym		NEAR	EST		date	13/11/2008						
Participants	Type of expenditure (as defined by participants)	budget		Actual cos	ts(Euro)		% spent	remaining budget (Euro)						
			period 1	period 2	period 3	total	total							
		е	а	b	с	e1	(a+b+c)/e	e-e1						
	other costs	85.000,00	73.250,00	35.856,00		109.106,00	128%	- 24.106,00						
	Total Costs	583.596,31	152.017,70	294.590,39		446.608,09	77%	136.988,22						
5 UBO	total person- month	32,00	6,17	10,67		16,84	53%	15,16						
	personnel costs	130.912,00	42.422,67	48.193,26		90.615,93	69%	40.296,07						
	subcontracting		-	-		-								
	travels	9.847,50	1.450,62	5.106,47		6.557,09	67%	3.290,41						
	consumables	6.720,00	-	-		-	0%	6.720,00						
	indirect costs	30.915,90	8.774,65	10.426,10		19.200,75	62%	11.715,15						
	other costs	7.100,00		-		-	0%	7.100,00						
	Total Costs	185.495,40	52.647,94	63.959,67		116.607,61	63%	68.887,79						
6 INGV	total person- month	36,00	11,00	12,00		23,00	64%	13,00						
	personnel costs	135.000,00	40.333,00	44.000,00		84.333,00	62%	50.667,00						
	subcontracting	76.441,40	75.000,00	-		75.000,00	98%	1.441,40						
	travels	24.240,00	4.977,11	18.902,44		23.879,55	99%	360,45						
	consumables	105.000,00	86.483,12	5.540,71		92.023,83	88%	12.976,17						
	indirect costs	71.042,60	35.985,00	22.717,73		58.702,73	83%	12.339,87						
	other costs	90.973,00	48.131,81	45.145,52		93.277,33	103%	- 2.304,33						
	Total Costs	502.697,00	290.910,04	136.306,40		427.216,44	85%	75.480,56						
7 THF	total person- month	12,00	7,00	5,00		12,00	100%							
	personnel costs	61 200 00	29 622 99	27 898 30		57 521 29	94%	3 678 71						
	subcontracting	0.1.200,00	-	-		-	0.70	0.07.0,7.1						
	travels	10.000,00	3.194,40	2.012,75		5.207,15	52%	4.792,85						
	consumables	56.861,67	16.878,87	8.293,48		25.172,35	44%	31.689,32						
	indirect costs	28.012,33	10.583,25	8.364,90		18.948,15	68%	9.064,18						
	other costs	12.000,00	3.220,00	3.620,00		6.840,00	57%	5.160,00						
	Total Costs	168.074,00	63.499,51	50.189,43		113.688,94	68%	54.385,06						

Participant	Type of expenditure (as defined by participants)	budget		Actual cos	ts(Euro)		% spent	remaining budget (Euro)
			period 1	period 2	period 3	total	total	
		e	а	b	C	e1	(a+b+c)/	e-e1
8.UGB	total person-month	36.00	6.03	12.26		18 29	51%	17 71
0 OGIT	total person month	00,00	0,00	12,20		10,23	5178	17,71
	personnel costs	65.988,00	12.102,48	24.204,96		36.307,44	55%	29.680,56
	subcontracting		-	-		-		
	travels	20.345,33	10.555,55	8.949,36		19.504,91	96%	840,42
	consumables	22.000,00	10.732,96	4.780,86		15.513,82	71%	6.486,18
	indirect costs	21.666,67	6.678,19	7.587,03		14.265,22	66%	7.401,45
	other costs					-		-
	Total Costs	130.000,00	40.069,18	45.522,21		85.591,39	66%	44.408,61
9 IM	total person-month	9,00	3,83	2,84		6,67	74%	2,33
	personnel costs	22.691,70	5.995,87	7.212,05		13.207,92	58%	9.483,79
	subcontracting		-	-		-		
	travels	9.025,80	1.026,00	3.211,14		4.237,14	47%	4.788,66
	consumables	12.250,00	3.554,00	-		3.554,00	29%	8.696,00
	indirect costs	8.793,50	2.115,16	2.084,63		4.199,79	48%	4.593,71
	other costs	-				-		-
	Total Costs	52.761,00	12.691,03	12.507,82		25.198,85	48%	27.562,16
10 CNRST	total person-month	24,00	13,40	11,94		25,34	106%	- 1,34
	personnel costs	49.920,00	38.416,40	33.295,20		71.711,60	144%	- 21.791,60
	subcontracting		-	-		-		
	travels	31.000,00	10.333,76	18.055,80		28.389,56	92%	2.610,44
	consumables	2.211,67	1.255,61	1.255,61		2.511,22	114%	- 299,55
			10 000 10	10 501 00		07 400 50	1100/	0.000.17
	indirect costs	23.626,33	16.968,18	10.521,32		27.489,50	116%	- 3.863,17
	other costs	35.000,00	34.835,16	-		34.835,16	100%	164,84
	Total Costs	141.758,00	101.809,11	63.127,93		164.937,04	116%	- 23.179,04
11 XISTOS	total person-month	8,50	8,00	1,40		9,40	111%	- 0,90
	personnel costs	85.000,00	80.000,00	14.000,00		94.000,00	111%	- 9.000,00
	subcontracting		-	-		-		
	travels	22.520,00	9.500,00	2.000,00		11.500,00	51%	11.020,00
	consumables		-	-		-		
	indirect costs	25.500,00	24.000,00	4.200,00		28.200,00	111%	- 2.700,00
	other costs	-				-		-
	Total Costs	133.020,00	113.500,00	20.200,00		133.700,00	101%	- 680,00
TOTAL	total person-month	480,64	178,98	190,69	-	369,67	77%	
	personnel costs	1.603.017,03	637.100,10	584.131,93	-	1.221.232,03	76%	
	subcontracting	260.941,40	107.300,00	76.206,88	-	183.506,88	70%	
	travels	265.026,89	91.426,34	137.168,31	-	228.594,65	86%	
	consumables	520.158,34	180.726,18	132.040,20	-	312.766,38	60%	
	indirect costs	1.160.066,93	428.759,37	452.646,77	-	881.406,14	76%	
	other costs	410.568,00	239.794,10	145.759,45	-	385.553,55	94%	
	Total Costs	4.219.778,59	1.685.106,09	1.528.274,88	-	3.213.380,97	76%	

Table 4

Person-Month Status Table

contrac	t n 37110						Partner	Person-I	months p	er Workp	ackage				AC own staff						
Acrony	m: NEAREST			1	2	3	4	5	6	7	8	9	10	11	S	2	6	7	8	9	
Period 2	2 from 01/10/2007 to 30/09/20	TOTALS	ISMAR	FFCUL	csic	AWI	UBO	NGV	тен	UGR	W	CNRST	XISTOS	AC total	FFCUL	INGV	ТЕН	UGR	M		
WP1	Tsunami source identification	WP person months	11,81	3	4	2		2					0,81		3,68	3,68					
WP2	Tsunami source characterisation	WP person months	36,32	2		25,5	1	6					1,82		1,5	1,5					
WP3	Seismological monitoring	WP person months	31,35	3	2	2	14	1	1,5		4,26	0,5	3,09		6,91	0,21	1,7		5	0	
WP4	Tsunami signal detection	WP person months	21,26	11		0,1	0,5		4,5	3,5	1,66				6,36	0,86	3	1,5	1	0	
WP5	Data integration/ Integrated tsunami detection network	WP person months	13,64	1	3	2,1	1				4	1,5	1,04		14,29	0,29			12	2	
WP6	Paleotsunami and Paleoseismic records	WP person months	41,54	5	10	22		1,5					3,04		3,92	3,92					
WP7	Modelling of tsunami impact on SW Portugal	WP person months	15,93	4	9				2		0,66		0,27		4	4					
WP8	Feasibility study and prototype for an EWS	WP person months	7,83	0,5	1	0,5			2	1,2	1	0,33		1,3	3,43	1,73	0,7	1			
WP9	Curculation of project information to end users	WP person months	5,34	1		0,3	1		1,5		0,34	0,33	0,87		0,55		0,3			0,25	
WP10	Project management	WP person months	5,67	1,5	0,58	0,5	0,5	0,17	0,5	0,3	0,34	0,18	1	0,1	3,4		0,3	1	2	0,1	
TOTAL		190,69	32	29,58	55	18	10,67	12	5	12,26	2,84	11,94	1,4	48,04	16,19	6	3,5	20	2,35		

2. Form C Financial Statements

The Excel file containing all data referred to Form C "CS_37110_2_summary.xls", together with the single Forms C for each Nearest partner are included as separate files in the electronic version of the present report.

The paper version of the present document contains the forms signed in originals by the authorised persons of each project partner.

3. Summary Financial Report

								Summa	ry Financ	ial Report	t								
Type of	Instrument	STReP	Project Title (or A	Acronym)	INTEGRATE	ED OBSERVA	TIONS FRO	M NEAR SHO	ORE SOURC	ES OF TSUN	AMIS: TOW	ARDS AN EA	RLY WARNI	ING SYSTEM Contract N°				37110	
Report	ting period n	umber	2	From (dd/	mm/yyyy)	01/10/2007					To (dd/n	nm/yyyy)		30/09/2008				Page	1/1
Contractor	Organisation Short Name	Cost model	Eligible costs (in €)	Research and Techno- logical Development / Innovation (A)		Demonstration (B)		Type of a	Training (C)		ent of the ortium))	Other Specific Activities (E)		Total eligible costs (F)=(A)+(B)+(C)+(D)+(E)		Receipts		EC contribution	
	Chort Hume	used		Contractor	Third party(ies)	Contractor	Third party(ies)	Contractor	Third party(ies)	Contractor	Third party(ies)	Contractor	Third party(ies)	Contractor	Third party(ies)	Contractor	Third party(ies)	Maximum	Requested
			Direct eligible costs	138.191,68	0,00	0,00	0,00	0,00	0,00	28.966,32	0,00	0,00	0,00	167.158,00	0,00				
	CONSIGUO		of which direct eligible	0,00	0,00	0,00	0,00	0,00	0,00	12.000,00	0,00	0,00	0,00	12.000,00	0,00				
1	NAZIONALE	FC	Indirect eligible costs	93.485,74	0,00	0,00	0,00	0,00	0,00	13.505,19	0,00	0,00	0,00	106.990,93	0,00	0,00	0,00	158.310,22	158.310,22
	RICERCHE		Adjustment on	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
			Total eligible costs	231.677,42	0,00	0,00	0,00	0,00	0,00	42.471,51	0,00	0,00	0,00	274.148,93	0,00				
	FUNDACAO		Direct eligible costs	146.809,48	0,00	0,00	0,00	0,00	0,00	984,10	0,00	0,00	0,00	147.793,58	0,00				
	DA FACULDADE		of which direct eligible costs of subcontracting	4.833,30	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4.833,30	0,00				
2		AC	Indirect eligible costs	28.395,23	0,00	0,00	0,00	0,00	0,00	196,82	0,00	0,00	0,00	28.592,05	0,00	0,00	0,00	176.385,63	176.385,63
			Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
	LISBOA		Total eligible costs	175.204,71	0,00	0,00	0,00	0,00	0,00	1.180,92	0,00	0,00	0,00	176.385,63	0,00				
	CONSEJO SUPERIOR DE INVESTIGACI ONES CIENTIFICAS		Direct eligible costs	176.062,04	0,00	0,00	0,00	0,00	0,00	3.315,14	0,00	0,00	0,00	179.377,18	0,00				
			of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
3		FC	Indirect eligible costs	206.721,37	0,00	0,00	0,00	0,00	0,00	5.237,92	0,00	0,00	0,00	211.959,29	0,00	0,00	0,00	199.944,77	199.944,77
			Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
			Total eligible costs	382.783,41	0,00	0,00	0,00	0,00	0,00	8.553,06	0,00	0,00	0,00	391.336,47	0,00				
	AL FRED-		Direct eligible costs	253.099,97	0,00	0,00	0,00	0,00	0,00	2.287,63	0,00	0,00	0,00	255.387,60	0,00				
	WEGENER-		of which direct eligible costs of subcontracting	59.373,58	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	59.373,58	0,00				
4	FUER POLAR	FCF	Indirect eligible costs	38.745,27	0,00	0,00	0,00	0,00	0,00	457,52	0,00	0,00	0,00	39.202,79	0,00	0,00	0,00	148.667,77	148.667,77
	MEERESFOR		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
	SCHUNG		Total eligible costs	291.845,24	0,00	0,00	0,00	0,00	0,00	2.745,15	0,00	0,00	0,00	294.590,39	0,00				
			Direct eligible costs	33.420,47	18.710,06	0,00	0,00	0,00	0,00	0,00	1.169,20	0,00	0,00	33.420,47	19.879,26				
	UNIVERSITE		of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
5	BRETAGNE	FCF	Indirect eligible costs	6.684,09	3.742,01	0,00	0,00	0,00	0,00	0,00	233,84	0,00	0,00	6.684,09	3.975,85	0,00	0,00	32.681,36	32.681,36
	E		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
			Total eligible costs	40.104,56	22.452,07	0,00	0,00	0,00	0,00	0,00	1.403,04	0,00	0,00	40.104,56	23.855,11				
	ICTITUTO		Direct eligible costs	112.338,67	0,00	0,00	0,00	0,00	0,00	1.250,00	0,00	0,00	0,00	113.588,67	0,00				
	NAZIONALE		of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
6	DI GEOFISICA E	AC	Indirect eligible costs	22.467,73	0,00	0,00	0,00	0,00	0,00	250,00	0,00	0,00	0,00	22.717,73	0,00	0,00	0,00	136.306,40	136.306,40
	VULCANOLO GIA		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
	UIA		Total eligible costs	134.806,40	0,00	0,00	0,00	0,00	0,00	1.500,00	0,00	0,00	0,00	136.306,40	0,00				

	TECHNISCHE		Direct eligible costs	40.804,53	0,00	0,00	0,00	0,00	0,00	1.020,00	0,00	0,00	0,00	41.824,53	0,00				
	FACHHOCHS		of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
7	BERLIN -	AC	Indirect eligible costs	8.160,90	0,00	0,00	0,00	0,00	0,00	204,00	0,00	0,00	0,00	8.364,90	0,00	0,00	0,00	50.189,43	50.189,43
	University of Applied		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
	Sciences		Total eligible costs	48.965,43	0,00	0,00	0,00	0,00	0,00	1.224,00	0,00	0,00	0,00	50.189,43	0,00				
			Direct eligible costs	36.735,18	0,00	0,00	0,00	0,00	0,00	1.200,00	0,00	0,00	0,00	37.935,18	0,00				
			of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
8	UNIVERSIDA D DE	AC	Indirect eligible costs	7.347,03	0,00	0,00	0,00	0,00	0,00	240,00	0,00	0,00	0,00	7.587,03	0,00	0,00	0,00	45.522,21	45.522,21
	GRANADA		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
			Total eligible costs	44.082,21	0,00	0,00	0,00	0,00	0,00	1.440,00	0,00	0,00	0,00	45.522,21	0,00				
			Direct eligible costs	9.766,01	0,00	0,00	0,00	0,00	0,00	657,18	0,00	0,00	0,00	10.423,19	0,00				<u> </u>
	INSTITUTO		of which direct eligible	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
9	DE METEOROLO GIA	AC	Indirect eligible costs	1.953,20	0,00	0,00	0,00	0,00	0,00	131,43	0,00	0,00	0,00	2.084,63	0,00	0,00	0,00	12.507,82	12.507,82
			Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
	CENTRE		Total eligible costs	11.719,21	0,00	0,00	0,00	0,00	0,00	788,61	0,00	0,00	0,00	12.507,82	0,00				
			Direct eligible costs	50.078,21	0,00	0,00	0,00	0,00	0,00	2.528,40	0,00	0,00	0,00	52.606,61	0,00				
	NATIONAL		of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
10	POUR LA RECHERCHE	FCF	Indirect eligible costs	10.015,64	0,00	0,00	0,00	0,00	0,00	505,68	0,00	0,00	0,00	10.521,32	0,00 0,0	0,00	0,00	33.081,0 [.]	33.081,01
	SCIENTIFIQU E ET		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
	TECHNIQUE		Total eligible costs	60.093,85	0,00	0,00	0,00	0,00	0,00	3.034,08	0,00	0,00	0,00	63.127,93	0,00				
			Direct eligible costs	15.000,00	0,00	0,00	0,00	0,00	0,00	1.000,00	0,00	0,00	0,00	16.000,00	0,00				
			of which direct eligible costs of subcontracting	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
11	DEVELOPPE	FC	Indirect eligible costs	3.900,00	0,00	0,00	0,00	0,00	0,00	300,00	0,00	0,00	0,00	4.200,00	0,00	0,00	0,00	10.750,00	10.750,00
	MENT S.A.		Adjustment on previous period(s)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00				
			Total eligible costs	18.900,00	0,00	0,00	0,00	0,00	0,00	1.300,00	0,00	0,00	0,00	20.200,00	0,00				
Total eligil	ble costs			1.440.182,44	22.452,07	0,00	0,00	0,00	0,00	64.237,33	1.403,04	0,00	0,00	1.504.419,77	23.855,11	0,00	0,00	1.004.346,61	1.004.346,61
Maximum	calculated EC c	ontributio	on for the reporting	927.480,20	11.226,04	0,00	0,00	0,00	0,00	64.237,33	1.403,04	0,00	0,00		1.004.346,61	L	0,00	I I	
Amount of	the financial in	terests ac	enerated by the prefinance	cina	500.100,24		5,00		0,00	<u>.</u>	30.040,01		0,00		0.00				
Demused		in the second second																	
Request	ed EC contrib	button to	or the reporting period	lin €)										1.	004.346,61				