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Project acronym
EMCOL

Project Title
EASTERN MEDITERRANEAN CENTRE FOR OCEANOGRAPHY AND LIMNOLOGY

FP6-ACC-SSA-2

"Integrating and Strengthening the European Research Area"
Promotion of Co-operation with Associated Candidate Countries:
Reinforcement of the Associated Candidate Countries' Research Capacities

Publishable Final Activity Report

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Project coordinator name: Prof. Dr. Namık Çağatay
Project coordinator organisation name: Istanbul Technical University (ITU)

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1. Project Execution

1.1 Summary of the objectives and the work performed

The EMCOL (Eastern Mediterranean Centre for Oceanography and Limnology) project has the following main objectives:

1. To establish state-of-the-art laboratory and field infrastructure that will be used extensively in marine and lake studies, including *natural hazards and environmental changes*,

2. To develop highly qualified first- and second-generation researchers in interdisciplinary marine and lake studies at ITU (Istanbul Technical University), covering a wide range the fields such as underwater earthquake geology, tsunamis, submarine land slides, floods, climate change and environmental pollution,

3. To enhance interactions in projects and idea exchanges between ITU researchers and those in the EU countries, and

4. To encourage Turkey's trained scientists to remain in Turkey by offering desirable employment opportunities in their field of expertise.

The project coordinator is Prof. Namık Çağatay (cagatay@itu.edu.tr) of Faculty of Mines, Istanbul Technical University (ITU, Maslak Campus, 34469 Istanbul). ITU is the only participant in this poject.

In the first two-year period of the EMCOL project, the efforts concentrated on the development of the state-of-the-art field and laboratory infrastructure and training of the young scientists. In the final period, EMCOL project team concentrated in the various EC FP, international collaborative and graduate student thesis projects and project proposal writing activites in line with the project objectives. In this way, EMCOL has served the needs of researchers in project activities at a full scale in the areas of *natural hazards and environmental changes.* With the use of the EMCOL facilities it has been possible to map active faults and submarine landslides, determine high resolution records of past earthquakes and tsunamis that are essential for earthquake and tsunami risk assessment. The same facilities has also been used for determination of the high resolution sediment records of sea-level, climate and ecological changes.

The project was designed in terms of five different work packages (WP): WP1: Management of Resources, WP2: Review, Assessment and Reporting, WP3: Development and Maintenance of Infrastructure, WP4: Training of laboratory teams, and WP5: Brokerage Events. The work performed and results achieved so far under each work package are summarized below.

WP1: This WP includes mobilization of existing human resources and making the arrangements for expert training visits to EMCOL.

Technicians: an electrician (Hurşit Bolat) and a geophysics specialist (Veli Geçgel) were assigned to the project by the ITU's Faculty of Mines starting project month 10th. The electrician established upgraded electrical connections in the laboratories. The geophysics specialist assisted with processing and storage of X-ray core scanner and core-logger data.

Part-time graduate research assistants: Three doctoral students were assigned to the project on a part time basis by the ITU-Faculty of Mines starting project month 1. This number was raised to four by the assignment of a fourth student from the Eurasia Institute of Earth Sciences at project month 13. They, together with EMCOL's 4 full-time students employed from the project budget, and two students recruited with TUBITAK scholarships, assisted with EMCOL's laboratory development and maintenance and day-to-day operation of field and laboratory equipment. All

the 10 graduate assistants are registered in the graduate programmes of Istanbul Technical University (ITU), and used the EMCOL facilities for their graduate research projects.

Secretary: Medine Çal, secretary of General Geology Section in ITU, has also acted as EMCOL's secretary on part-time basis.

EMCOL's Web-page. (www.mines.itu.edu.tr/emcol) was set up starting with month 1 of the project. It was continuously updated with a new address: www.emcol.itu.edu.tr, on 15th March 2006. The web-site was attacked by hackers beginning October 2007. New EMCOL web site with the same address (www.emcol.itu.edu.tr) was reconstructed immediately with updates using a hacker-proof software provided by the university. The web-site has been continuously updated to announce EMCOL's project, management and training activities throughout the project. The minutes of the monthly Management Committee meetings, Advisory Committee meetings and User Committee meetings were placed on the web-site.

Selection of Visiting Experts for Training Purposes. Several experts from EU countries were selected to give training in the use and applications of core scanner, core-logger, seismic software and CTD probe during the first year of the project. Five of the experts (Dr. Ian Boomer, Dr. Hüsne Altıok, Dr. Jens Grutzner, Dr. Luca Gasperini, Professor Laurent Labeyrie) visited EMCOL between 16 and 34 project months and delivered training short courses relevant to EMCOL's objectives. These courses are listed under WP4b.

Organization of Laboratory Space and Existing Laboratory Equipment. Restructuring and upgrading of the available laboratory space were completed for installation and housing of new equipment within the first project year. Upgrades to the electrical wiring and plumbing systems, floor covering and benches were completed in the Core Analyses, Geochemistry and Sedimentology laboratories, together with the installation of a water filtration and de-ionizing system in the Sedimentology & Geochemistry laboratories. The electrical circuits in all of EMCOL's rooms are now safeguarded with UPS. The UPS in the Core Analysis Lab was upgraded during the third period to enable the XRF Core Scanner operate at full power. In all EMCOL laboratories internet connection was established. The Field Equipment Storage Facility was assigned two rooms, one of which was provided during the third period to store EMCOL's large field equipment. The Core Storage Room was fitted with a new, heavy-duty shelving system, improved electrical wiring, temperature and humidity sensor and an alarm. EMCOL's sediment cores were placed in a systematic order in the room. In addition to the laboratory space, an office for EMCOL's full-time research students was assigned in the Faculty of Mines building. This room was fully renovated and fitted with office furnature, equipment and computers with internet connection. In the third period, EMCOL acquired a fully furnished meeting room for project meetings and seminars, and and a lab space that can be used for a future isotope geochemistry laboratory.

WP2: The compositions of the **Management Committee** (EMC) and the **Advisory Committee** (EAC) for EMCOL were finalized during the first management committee meeting of the project. EMC consisting of a coordinator and five task leaders in charge of different laboratories and facilities were officially appointed by the Rector and the University Senate during project by project month 3.

Initially *EMCOL's Management Committee* consisted of:

Coordinator:	Namık Çağatay
Sedimentology:	Lisa Doner
Geochemistry:	Remzi Akkök
Core Analyses:	Can Genç and Nilgün Okay

Core Repository: Nilgün Okay
Field Equipment: Mahir Vardar

There was only one change in the EMCOL's **Management Committee** (EMC) during the project period: this being the replacement of Dr. Lisa Doner by Dr. Ercan Özcan as the task leader of the Sedimentology Laboratory starting 16th project month. This change took place because the Dr. Lisa Doner's departure from ITU for USA. The EMC met monthly to review EMCOL's progress towards its deliverables and objectives. All task leaders, research assistants and potential users of EMCOL were invited to participate in these monthly management meetings. The meeting minutes were compiled within less than a week of the meetings and distributed by email to all of the EMCOL members and posted on the EMCOL's web-page.

EMCOL's Advisory Committee (EAC) consisted of four individuals nominated by the management committee in the first management committee meeting served as external advisors to EMCOL during the first year:

1. Prof. Dr. Temel Oğuz (Marine Sciences Institute, METU, Erdemli, İçel)
2. Dr. Frank Niessen (Alfred Wegener Institute, Bremerhaven, Germany)
3. Nazım Çubukçu (SHOD , Çubuklu, Istanbul)
4. Kerim Sarıkavak (MTA, Marine Research Unit)

The SHOD representative on the committee was changed during the second and third years of the project. Admiral Nazım Çubukçu of SHOD (Department of Navigation, Hydrography and Oceanography) retired from service on 30 August 2006, and was replaced for the second year by Dr. Erhan Gezgin of SHOD, a physical oceanographer, who himself was replaced in the third year by Mustafa Özyalvaç, another physical oceanographer. The decision for these replacements was made by the SHOD.

The EAC met in every April during the years 2006, 2007 and 2008 to carry out an annual review of EMCOL and to assess overall progress towards the project objectives. Their review included consultations with the doctoral students at EMCOL and other potential user groups within ITU. Their recommendations are appended in the annual review report to the Management Committee and placed on the EMCOL's web-site. The EMCOL User Committee (EUC) met at the end of April in the years 2007 and 2008, and made useful recommendation on the EMCOL facilities. The minutes of the two EUC meetings were place on EMCOL's web-site.

WP3 included development of infrastructure which consists of laboratories and field equipment facility with several state-of-the-art equipment. The majority of the budget allocated to this WP was used for establishing the following facilities:

A. Core Analysis Laboratory. An XRF Core scanner (ITRAX™) was installed in the core analysis lab in March, 2006 and the Multi Sensor Core Logger (Geotek MSCL) in February 2007. Establishment of EMCOL's fully functional state-of-the-art Core Analysis Laboratory, is a major achievement for the project. It has been extensively used in the project work from February 2007 until now, being instrumental in new extensive project initiatives in EMCOL.

B. Sedimentology Laboratory was completely established with the installation of laser diffraction grain-size analyzer, bench-top freeze-dryer, and a bench-top centrifuge and a microbalance in the first year. ITU's contributions to EMCOL include a mechanical shaker and sieves, a fume hood, microbalance, cabinets and an in-line sink sediment trap.

C. Geochemistry Laboratory was established by the end of the first project year. It houses a total organic and inorganic carbon (TOC/TIC Shimadzu) analyzer, a spectrophotometer, ultrasonic

bath, constant temperature bath, drying oven, water filtration equipment and pump, pore-water extraction equipment, set of automatic pipettes, and lab glassware.

D. Field Equipment Storage Facility was assigned to a secure room in the Faculty of Mines Building during the first year. An additional space in the basement of the Mines Building was provided for storing large field equipment. The field equipment established by the 24 project month include platform with a Uwitec tripod for lake coring and an motor (5HP), a small boat (6 m) with a motor (25 HP) and a trailer, a sub-bottom profiler (INNOMAR Model SES-2000) system, a Valeport CTD with a dissolved oxygen sensor and 200m cable, a CSI Wireless PowerMax DGPS, a Rossfelder underwater vibrocorer, two hammer/piston corers, two water/sediment (Kajak) corers, a Van Veen-type grab and two electrical generators.

E. Wet-Core Laboratory. This laboratory was already functional from the start of the project. A core photography set-up was manufactured by the end of May, 2006, which was later modified in the third year of the project. ITU's contribution in this laboratory involves a core-cutter and geotechnical equipment.

F. Core storage room was fitted with custom-made shelves and upgraded electrical wiring using funds from the project budget. The cores are now systematically stored in this storage room. The cold room was fitted with a temperature sensor and alarm system in the15th project month.

All the above EMCOL infrastructure facilities were extensively used in projects, especially during the third year.

WP4 included the *employment of 4 full-time doctoral students* and *training of the laboratory teams* to ensure proper use of EMCOL's equipment. EMCOL widely advertised for four full-time graduate students. Two of the five applicants were qualified to start as the EMCOL doctoral students as of 1 September, 2005. TÜBİTAK assigned two graduate-student scholarships to the EMCOL project since 1 March 2006. The remaining three positions were filled in by September, 2006. Since that time EMCOL has had 10 graduate students (6 full-time and 4 part-time), who are all registered in the graduate programs of ITU. During the entire project the graduate students contributed a total of 224 man-month to the EMCOL project. Three students completed their graduate thesis. The others are expected to complete within the next year.

Training of the laboratory teams consisted of 6 on-site short courses and 16 off-site training courses and visits to well-developed labs in EU. During the first year, task leaders and research assistants visited GeoForschungsZentrum (GFZ), Potsdam and IODP core repository, Bremen University during 12-17 March, 2006, and obtained valuable information on MSCL, XRF scanner and sample preparation techniques. Training sessions and discussions with the laboratory managers in these institutions concerning the day- to-day running of the equipment and laboratories were also beneficial. In addition, EMCOL research assistants and task leaders had training sessions in EMCOL on the XRF core scanner, laser particle-size analyzer, TOC/TIC analyzer by scientists from the supplier companies.

During the second year, there were two off-site training sessions for EMCOL graduate students in MSCL (Multisensor core-logger) in IODP Bremen Core Repisotory during September, 2006 and in GFZ Potsdam, Germany during early November, 2006. On-site training and short courses during the second year included "Hands-on training on the INNOMAR seismic equipment" by the INNOMAR engineers, "Ostracods" by Dr. Ian Boomer of Birmingham University, "the use and applications of our CTD probe" by Dr. Hüsne Altıok, "EMCOL's SES-2000 subbottom profiling system" by Prof. Emin Demirbağ, "Hands-on installation and training course on MSCL" by Dr. Peter Schultheiss of GEOTEK, "Core Logging Methods in Marine Geology" by Dr. Jens Grützner of Bremen University (MARUM), "Pore-water extraction and sulfate and alkalinity analysis" by Namık Çağatay, "training course on XRF Core Scanner" by Cox

Analytical engineers. During the third year, the training courses were “SEISPRO (seismic processing software) and CHIRCORE (Chirp-core correlation software) by Dr. Luca Gasperini of CNR-ISMAR, Bologna, “ESONET NoE training short-course on Seafloor observations” and “ESONET Best practice workshop” in Bremen, “Geochemical methods used in the analysis of sedimentary records” by Namık Çağatay, and “Geochemical tools/proxies in paleoceanography and paleoclimatology”, and “Applications on the analyseries computer software” by Laurent Labeyrie in EMCOL.

WP5 involved participation of EMCOL in new EU-FP projects and introduction of EMCOL to ESR and established researchers. For these purposes, EMCOL posters and brochures (in Turkish and English) were prepared and distributed in a total of 8 national and international meetings, carrier days, and project meetings. The posters and brochures were updated during the second year, and presented and distributed with 12 paper presentations in a total of 6 national and international scientific meetings in the second project year, and 26 paper presentations in 10 scientific meetings during the third project year.

EMCOL has increased its project and networking activities, especially in the third reporting period. It is presently a partner in two EC FP projects (ESONET NoE and EMSO Infrastructure), and subcontractor in two EC FP projects (Anatolian Seismic Cycles and TRANSFER). EMCOL is also involved in five on-going international collaborative projects, one national-funded project, and ten student-thesis projects funded by the university. EMCOL is also partner of the ESONET Marmara-Demostration Mission project to be carried in the Sea of Marmara during the next 30 months. MARMESONET proposal submitted last year to IFREMER has now been accepted to be funded with cruise in 2009. During third project year, EMCOL participated in five EC FP7 project proposals, in two of which as a coordinating institution.

At the end of the EMCOL project, all the project objectives have been achieved, and EMCOL’s state-of-the-art infrastructure have been completed and fully used for research and training in the fields of natural hazards and environmental change in marine and lake basins.

1.2 Major achievements

The Eastern Mediterranean Centre for Oceanography and Limnology (EMCOL) has been designed to combine the trained scientists in ITU with advanced field and laboratory facilities for marine and lake studies. EMCOL houses, administers, and utilizes the upgraded facilities and train new researchers in advanced methodologies in marine geology-geophysics, oceanography and limnology. This EU-quality facility at ITU also satisfies the need noted by many researchers in Europe.

The first objective "*To establish state-of-the-art laboratory and field facilities that will be used extensively in marine and lake studies, including natural hazards and environmental changes*" was achieved with the renovation of the laboratory and office spaces allocated in the ITU's Faculty of Mines building, and purchase and installation of the state-of–the-art equipment in these labs and for field facility rooms. These instruments are essential for modern research in the areas of natural hazards and environmental changes in marine and lake studies. In particular, the establishment of a fully functional state-of-the-art Core Analyses Laboratory by February 2007, with the installation of the ITRAX™ XRF Core scanner and Multi Sensor Core Logger (GEOTEK MSCL), and its extensive usage by scientists and research assistants in projects, are major achievements of the project.

With its field and laboratory (Core Analysis, Sedimentology, Geochemistry, Wet Core, Core Storage) facilities, EMCOL has become a state-of-the-art research centre in the region and served extensively in various EC FP, international, national and graduate thesis projects, including the "Marnaut", "Transfer", "Seismic Cycles of the Anatolian Faults", and "Earthquake risk assessment in the Sea of Marmara" and student thesis projects.

We have compiled a table (Table 1.1) of several research centres considered to operate at state-of-the-art levels, and a sample of their major equipment inventory comparable to what EMCOL will house by 1 November 2006. As can be seen from this table, EMCOL's infrastructure will be comparable to any other similar state of the-art-art facilities in European and the U.S. institutions, such as Alfred Wegener Institute (Bremerhaven), Geoforschungs Zentrum (Potsdam), Bremen University, Southampton National Oceanography Centre (U.K.) and Woods Hole Oceanographic Institution (U.S). This fact has been also recorded in the reports of the EMCOL's Advisory Committee (see Section 4: Deliverables, D1).

The details of major infrastructure developments regarding the field and laboratory facilities by the end of the project are presented below.

A. Core Analysis Laboratory. This laboratory houses an XRF Core scanner (ITRAX™) (installed in March, 2006) and the Multi Sensor Core Logger (Geotek MSCL) (Figs 1 and 2). The XRF Core Sanner uses XRF (X-Ray Fluorescence) methodology for geochemical analysis, digital X-ray radiography and 3-band digital colour scanning. The MSCL measures physical properties of sediment cores with the Gamma density, electrical resistivity, magnetic susceptibility, and p-wave velocity sensors. Gamma-ray density sensor was not originally planned, but taking the strong recommendation of the EMCOL's Advisory Committee and after consultations with the project's officers, it was purchased to complete the full set of sensors on the MSCL. EMCOL's Core Analysis Laboratory, equipped with the Geotek MSCL and the XRF Core scanner (ITRAX™), is one of the few state-of-the-art laboratory in core analysis in Europe. This laboratory has been extensively used in the project work from February 2007 until now, and has been instrumental in new project initiatives of EMCOL.

Table 1.1. EMCOL and other oceanographic and limnologic research centres with state-of-the-art facilities.

Research Center	ITRAX core scanner	Geotek MSCL	Sub-bottom profiler	CTD	Vibracorer	Grain-size analyzer	TOC/TIC or CHN analyzer
EMCOL	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Southampton Oceanography Centre, Univ. of Southampton, UK	**X**	**X**	**X**	**X**		**X**	**X**
Research Center Ocean Margins (RCOM), MARUM, Universität Bremen, Germany	**X**	**X**	**X**	**X**		**X**	**X**
GEOMAR Research Center for Marine Geosciences at Christian Albrechts University, Germany		**X**	**X**	**X**		**X**	**X**
Institute for Marine Research, Univ. of Kiel, Germany		**X**		**X**		**X**	**X**
GeoForschungsZentrum (GFZ), Potsdam, Germany	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Alfred Wegener Institute, Bremerhaven	**X**	**X**	**X**	**X**	**X**	**X**	**X**
National Centre for Marine Research (HCMR), Greece		**X**		**X**		**X**	**X**
Lamont-Doherty Earth Observatory, Columbia Univ., USA		**X**	**X**	**X**		**X**	**X**
Woods-Hole Oceanographic Institution, USA	**X**	**X**	**X**	**X**	**X**	**X**	**X**
College of Oceanic and Atmospheric Sciences, Oregon State Univ., USA		**X**				**X**	**X**
Graduate School of Oceanography, Univ. of Rhode Island, USA		**X**		**X**		**X**	**X**
Center for Advanced Marine Core Research, Kochi University, Japan	**X**	**X**					**X**
Department Of Earth Sciences, Hong Kong University, China		**X**				**X**	
National Institute of Oceanography (NIO), India		**X**	**X**	**X**	**X**	**X**	**X**
Limnogeology Laboratory at the Geological Institute, ETH Zürich, Switzerland		**X**		**X**	**X**	**X**	**X**
Limnological Research Center (LRC), Univ. of Minnesota, USA		**X**				**X**	**X**

Fig. 1. Core Analyses Laboratory consists of two rooms separated by a glass partition. In the photo the room with ITRAX core scanner is seen installed and running.

Fig. 2. GEOMSCL installed and working in the Core Analyses Laboratory

Sedimentology Laboratory includes laser diffraction grain-size analyzer, bench-top freeze-dryer, and a bench-top centrifuge, a microbalance, mechanical shaker and sieves, fume hood, microbalance, smear-slide drying unit with ultraviolet light (Fig. 3).

View of sedimentology lab with Analysette particle size analyser, Eppendorf centrifuge, fume cupboard and chest freezer. Also visible are the new wall panelling, benchtops, storage cupboards, sink and flooring.

Left: Analysette 22 Compact particle-size analyser and computer interface.
Right: Uninterrupted Power Supply (UPS) installed in sedimentology laboratory.

Fume cupboard and chest freezer.

Eppendorf Centrifuge.

Fig. 3. Sedimentology Laboratory

Geochemistry Laboratory houses organic/inorganic carbon analyzer (TOC/TIC Shimadzu) in the (Fig. 4), a visible light spectrophotometer, an ultrasonic bath (Fig. 5), constant temperature bath and a set of automatic pipettes, drying owen, water filtration equipment and pump, pore-water extraction equipment, set of automatic pipettes, and lab glassware.

Fig. 4. EMCOL's newly furnished Geochemistry Laboratory with the Shimadzu TOC/TICanalyzer for solid and liquid samples in the far left corner.

Fig. 5. Spectrophotometer and ultrasonic bath in the Geochemistry laboratory.

Field Equipment Storage Facility includes a platform with a Uwitec tripod for lake coring, a small boat (6 m) and motor (25 HP) and a trailer, a sub-bottom profiler (INNOMAR Model SES-2000) system, a Valeport CTD with a dissolved oxygen sensor and 200m cable, a CSI Wireless PowerMax DGPS, a Rossfelder underwater vibrocorer (Model VT-1), two hammer/piston corers, three water/sediment (Kajak) corers, one Van Veen-type grab and two electrical generators (Fig 6-11). These equipment are stored in two rooms in the first floor of the Facult of Mines building. Recently, ITU has acquired from MTA the Reseach Vessel Seismik that is operated by ITU's Maritime Faculty (Fig. 12). It is available for EMCOL surveys, and used for MARNAUT project cruise during May 2007. All these equipment have been used extensively in the various field studies, especiall during the summer 2007 season.

Wet-Core Laboratory has a core-cutter, geotechnical equipment, and a core photography set-up (Fig. 13, 14).

Core storage room, with custom-made shelves and upgraded electrical wiring and fitted with temperature and humidity sensors and an alarm system, is now used to systematically store sediment cores (Figs. 15, 16).

Fig. 6. Storage room for field equipments

Fig. 7. INNOMAR Model SES-2000 Subbottom Profiler in the Field Equipment Storage Room.

Fig. 8. Some new field sampling equipment manufactured during the second year of the project: grab sampler, core catchers of piston and vibra corers and Kajak Corer (from left to right).

Fig. 9. New Kajak corer manufactured for EMCOL for undisturbed lake sediment coring.

Fig. 10. EMCOL's boat

Fig. 11. EMCOL's new platform and tripod for lake sampling

Fig. 12. ITU's RV Seismic

Fig. 13. Wet Core Laboratory with benches and with the core-cutter being used

Fig. 14. Core photography set-up with sliding camera on top

Fig. 15. Cold Core Storage Room fitted with new shelves.

Fig. 16. Cold Core Storage Room fitted with temperature and humidity display unit and alarm.

Concerning the second objective "*To develop highly qualified first- and second-generation researchers in interdisciplinary marine and lake studies at ITU (Istanbul Technical University) covering a wide range the fields*", EMCOL increased its number of graduate students from 2 at project month 5 to 10 by the project month 16. These students included four graduate students employed from EMCOL project budget, two graduate students employed with TUBITAK scholarships and four students provided by the university on part-time basis. Three of these graduate students (Kadir Eriş (PhD), Deniz Dikçe (MSc) and Nil Irvalı (MSc)) completed their graduate degrees. All ten graduate studens were trained on the EMCOL equipment, methodology and applications in the field of geahazards and environmental changes, covering a wide range the fields such as underwater earthquake geology, tsunamis, submarine land slides, floods, climate change and environmental pollution. This was done through on-site and off-site training short courses, multidisciplinary project and thesis work.

During the first year, task leaders and research assistants visited GeoForschungsZentrum (GFZ), Potsdam and IODP core repository, Bremen University during 12-17 March, 2006, and obtained valuable information on MSCL, XRF scanner, sample preparation techniques, and day- to-day running of the equipment and laboratories. EMCOL's research assistants and task leaders have had training sessions in EMCOL on the XRF core scanner, laser particle-size analyzer, TOC/TIC analyzer by scientists from the supplier companies. With the establishment of most of the EMCOL facilities, the training short courses intensified during the second year. There were 2 off-site and 8 on-site training sessions. The off-site training courses for EMCOL graduate students included the MSCL (Multisensor core-logger) training in IODP Bremen Core

Repisotory during September, 2006 and in GFZ Potsdam, Germany during early November, 2006. On-site training and short courses during the second year included “Hands-on training on the INNOMAR seismic equipment” by the INNOMAR engineers, “Ostracods” by Dr. Ian Boomer of Birmingham University, “the use and applications of our CTD probe” by Dr. Hüsne Altıok, “EMCOL’s SES-2000 subbottom profiling system” by Prof. Emin Demirbağ, “Hands-on installation and training course on MSCL” by Dr. Peter Schultheiss of GEOTEK, “Core Logging Methods in Marine Geology” by Dr. Jens Grützner of Bremen University (MARUM), “Pore-water extraction and sulfate and alkalinity analysis” by Namık Çağatay, “training course on XRF Core Scanner by Cox Analytical engineers (Figs. 17-19). During the third year, the training courses were “SEISPRO (seismic processing software) and CHIRCORE (Chirp-core correlation software) by Dr. Luca Gasperini of CNR-ISMAR, Bologna, “ESONET NoE training short-course on Seafloor observations” and “ESONET Best practice workshop” in Bremen, “Geochemical methods used in the analysis of sedimentary records” by Namık Çağatay, and “Geochemical tools/proxies in paleoceanography and paleoclimatology” and “Applications on the analyseries computer software” by Laurent Labeyrie in EMCOL (Fig. 20).

In addition to the above training short courses, the graduate students gained hands-on field and laboratory experience through various project work carried out during the2007 summer field season (Figs. 21-27):

1. Lake coring and sampling: Setting up of the platform and various corers for lake studies. Sena Akçer, Gül Sürmelihindi, Dursun Acar participated in the EC FP TRANSFER and EC FP Marie Curie Ecellence Grant “Seismic Cycles” projects in Lake Hazar, Lake Yeniçağa and K.Çekemece, and were able to obtain sediment cores also for their own thesis projects.

2. Seismic subbottom profiling: Surveying of the entire Lake Hazar by Emre Damcı for his PhD thesis during July-August 2007.

3. Equipment deployment and recovery in the Sea of Marmara by Emre Damcı and Dursun Acar during the Marnaut (Marmara ESONET) project operations during June and September 2007.

4. Sediment pore-water extraction and analysis by Ummuhan Sancar and Deniz Dikçe during the Marnaut cruise in the Sea of Marmara, May-June 2007.

5. Core scanner analysis of cores for MARNAUT, TRANSFER and student thesis projects by Ummuhan Sancar, Sena Akçer, Gül Sırmalıhindi and Nil Irvalı.

6. MSCL analysis for the MARNAUT, EC FP TRANSFER, and student thesis projects by Emre Damci, Kadir Eriş, Dursun Acar, and Sena Akçer.

With the above training and project experience both the task leaders and graduate students are able to operate the various field and lab equipment.

Fig. 17. "Ostracod" course in EMCOL by Dr. Ian Boomer

Fig. 18. Core Analyses course by Dr.Jens Gruetzner

Fig. 19. Training on XRF Core scanner by Dr. Anders Rindby of Cox Analytical

Fig. 20. Laurent Labeyrie's short course on "Paleoclimate proxies" in EMCOL's new meeting room.

Fig. 21. Graduate students using the Sedimentology Laboratory

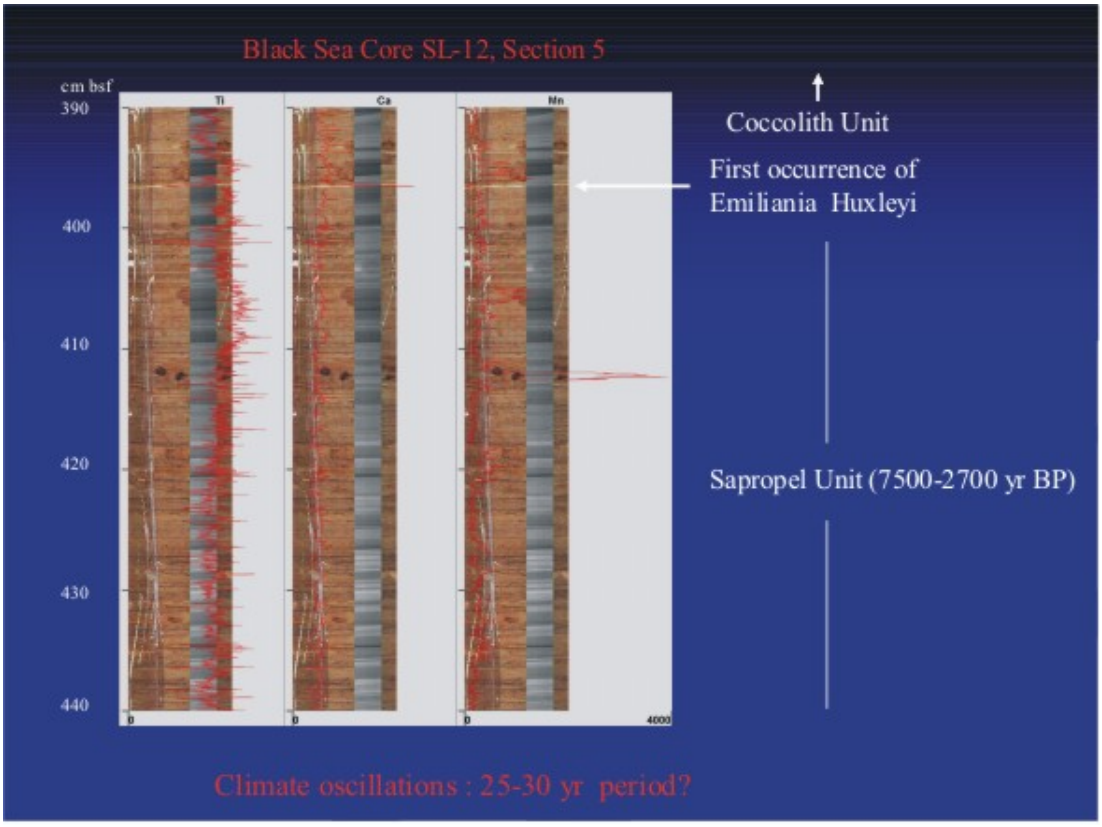


Fig. 22. Output of ITRAX core scanner analyses of a core carried out by Ümmühan Sancar, EMCOL's research assistant, for her PhD thesis project.

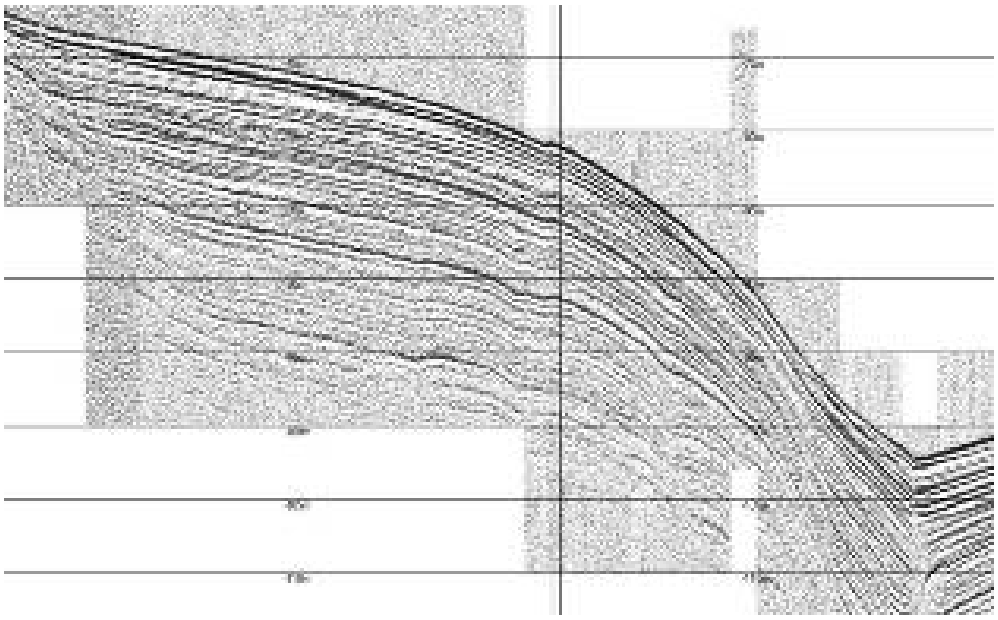


Fig. 23. Seismic sub-bottom profile from Lake Hazar in eastern Turkey, acquired by Emre Damci for his thesis work during Summer 2007 field campaign, using EMCOL's Innomar SES2000 Compact Sub-Bottom Profiler. The kink in the secion to the left is the trace of the East Anatolian Fault, a major plate boundary.

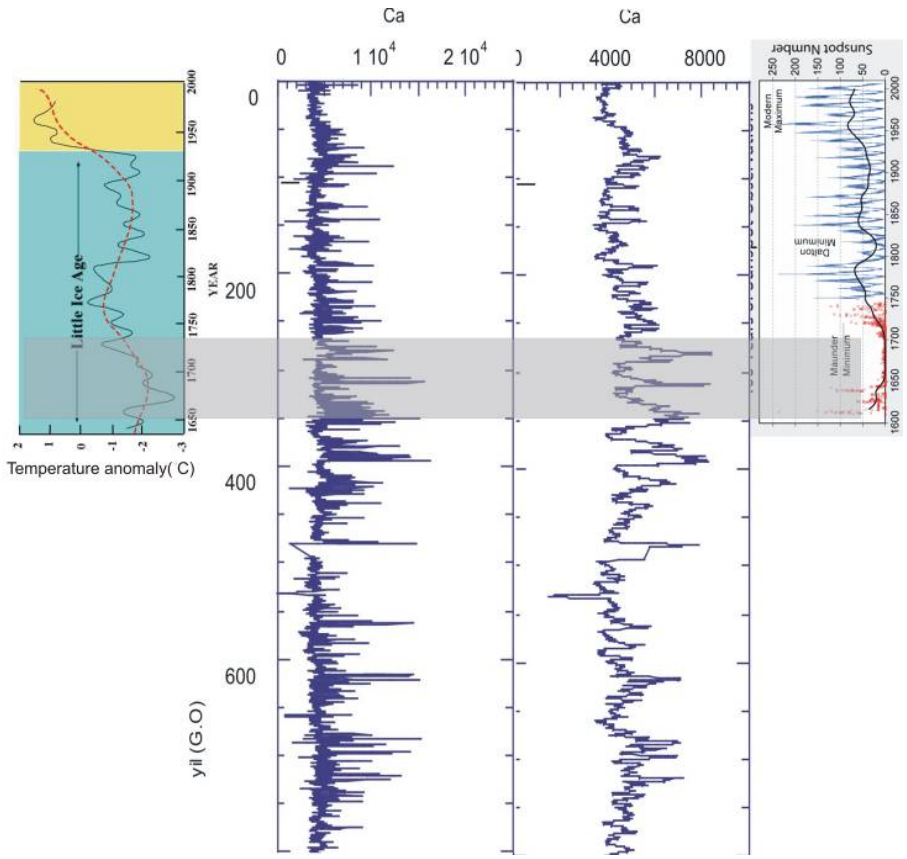


Fig. 24. Ümmühan Sancar's high resolution Core Scanner XRF analysis of the Black Sea core showing high Ca enrichment during Little Ice Age and Late Maunder Minimum (gray interval).

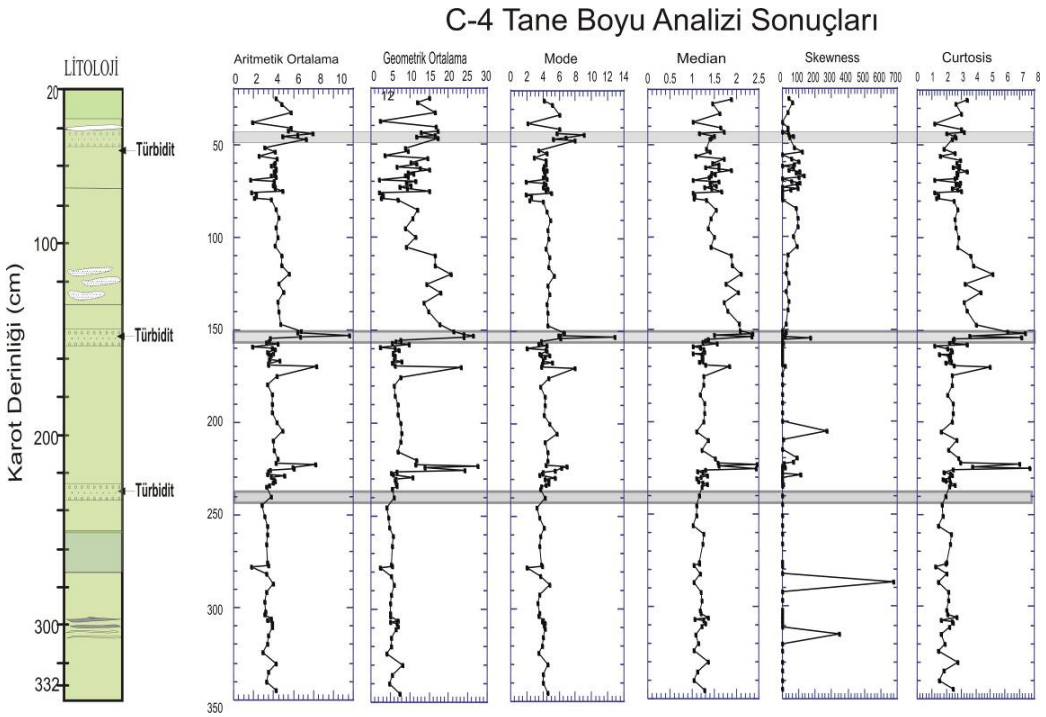


Fig. 25. Deniz Dikçe's laser-diffraction particle-size analysis of core C-4 for sismo-turbidite studies.

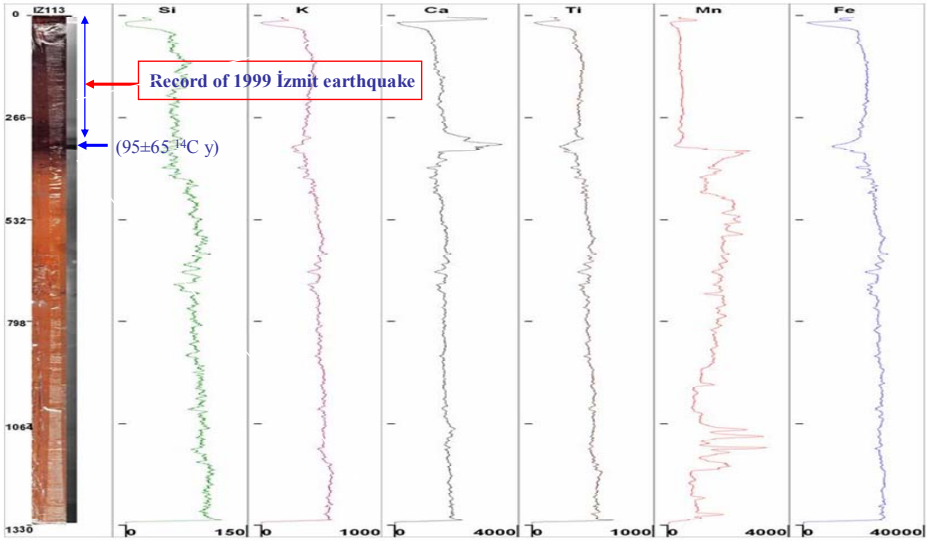


Fig. 26. XRF Core Scanner analysis of Core 113 from Izmit Gulf showing the record of the 1999 earthquake (Analysis by Ümmühan Sancar for the"Earthquake risk assessment" project funded by IBB).

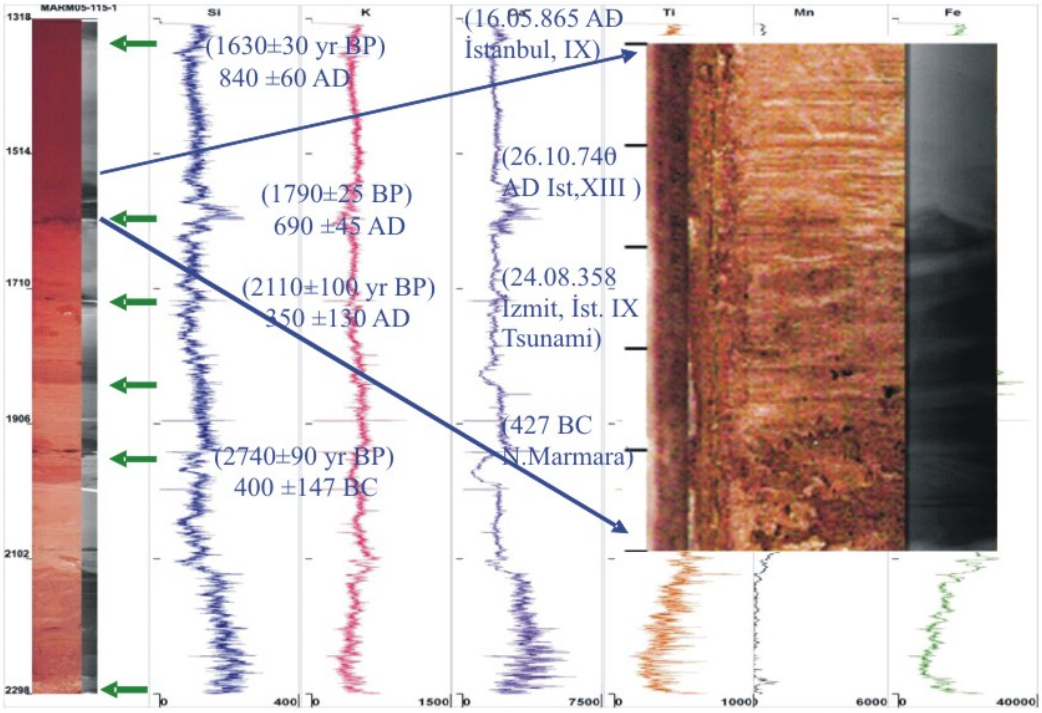


Fig. 27. Core scanner and AMS radiocarbon analyes of core IZ-115 in Izmit Gulf showing the correlation between the sedimentary and historical earthquake records (IBB funded "Earthquake risk assessment" project).

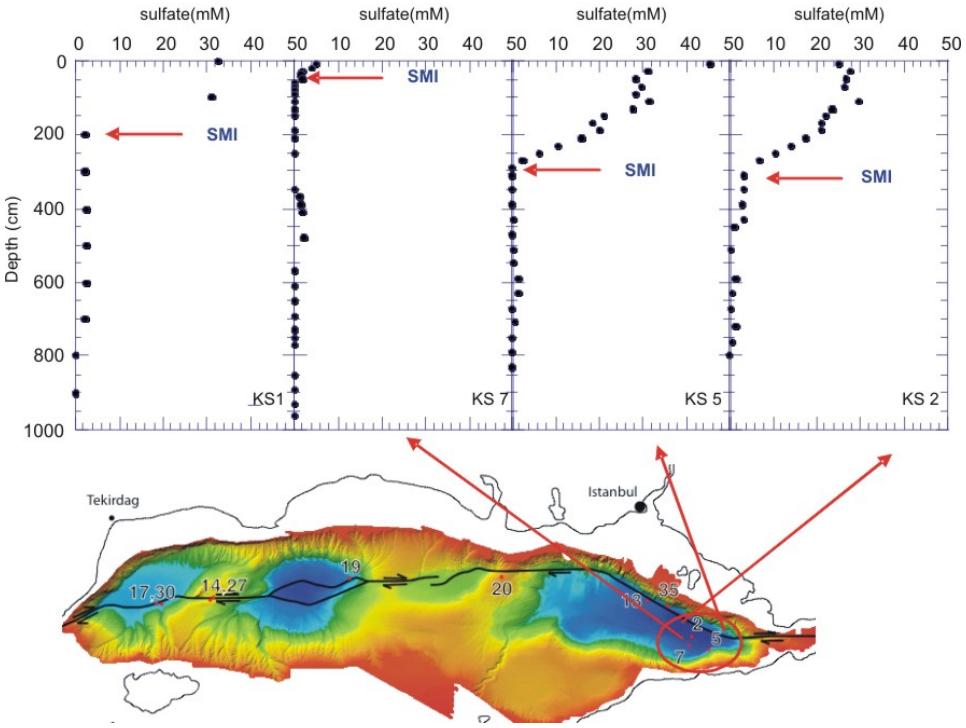


Fig. 28. Pore water sulphate profiles in the Sea of Marmara cores analyzed by Ümmühan Sancar and Deniz Dikçe in June 2007 (Marnaut project).

The third objective "*To enhance interactions in projects and idea exchanges between ITU researchers and those in the EU countries with at least one EC FP prposal"* was realized by EMCOL's successful participation in in project and networking activities at EU level. EMCOL is presently a partner in two EC FP projects (ESONET NoE and EMSO Infrastructure), and subcontractor in two EC FP projects (Anatolian Seismic Cycles and TRANSFER). EMCOL is also involved in five on-going international collaborative projects, one national-funded project, and ten student-thesis projects funded by the university. EMCOL is also partner of the ESONET Marmara-Demonstration Mission project to be carried in the Sea of Marmara during the next 30 months. MARMESONET proposal submitted last year to IFREMER has now been accepted to be funded with cruise planned in 2009. During third project year, EMCOL participated in five EC FP7 project proposals, in two of which as a coordinating institution. The details of EMCOL's projects are listed below.

EC FP projects: participation as a partner and sub-contractor in funded projects and in project proposals:

Partnerships and subcontracting in funded EC FP projects:

1. "*ESONET:* European Seafloor Observatory Network" NoE project (FP6-2005-GLOBAL-4). EMCOL is a partner in this large project. Namık Çağatay (EMCOL coordinator is a steering committee member). EMCOL is also a partner of *ESONET* Marmara-Demo Mission project under WP4. This Demonstration Mission project proposal has been funded with 500.000€ from ESONET *NoE* project budget and starts in May 2008.

2. *EMSO* "European Multidisciplinary Seafloor Observation" (INFRA-2007-2.2.1.8 FP7-2007). This ESFRI project started in April 2008. EMCOL is one of 12 partners and represents Turkey in the project

3. *TRANSFER "*Tsunami Risk and Strategies For the European Region*"* (Coordinatör: Prof.Dr. S.Tinti ve Turkish coordinator Prof.Dr. Yıldız Altınok). EMCOL as a sub-contractor in this project engaged in coring and core analysis.

4. "*Seismic Cycles of the Anatolian Faults*" (Coordinator: Aurelia Hubert-Ferrari). This 4-year project is supported by the EC-Marie Curie Excellence Grant (MEXT-CT-2005-025617). EMCOL is involved as a sub-contractor in the project with the task of recovery and analysis of the sediment cores from small lakes along the North and East Anatolian Faults (Lake Hazar mostly) and for studying the palaeoclimate records.

New EC FP7 proposals submitted and under review:

1. *HYPOX: In situ monitoring of oxygen depletion in hypoxic ecosystems of coastal and open seas, and land-locked water bodies.* Presented at EC FP7 Call ENV.2008.4.1.2.1. Monitoring and observing oxygen depletion throughout the different Earth system components: Area 6.4.1.2. Cross-cutting research activities relevant to GEO. Coordinator Prof. Dr. Antje Boetius, Coordinating institution: Max Planck Institute for Marine Microbiology. EMCOL is Partner 9 and the leader of WP4 "Deciphering long term records of hypoxia dynamics". EMCOL will carry out sediment core analysis for the records of past redox changes.

2. *DEPREM: Dynamic Environment for Probabilistic Seismic HazaRd Evaluation: Marmara test area.* Subitted to EC FP7 Call "ENV.2008.1.3.1.1. Proposal number: FP7-226932. Coordiantor Prof.Dr. Atilla Ansal (Bosphorus University). EMCOL is involved in offshore sedimentary earthquake records under WP3: Organization and homogenization of existing data.

3. *EMCLIME* "*Eastern Mediterranean Climate and Environmental Changes*". Submitted to FP7-REGPOT-2008-1 call, EPSS system with number 229862. The objectives 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.

4. *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 participation of EMCOL as the leading Turkish partner representing research, with SUTA (The Underwater Technologies Research Institute) and Istanbul Project Coordination Unit (IPCU) of Istanbul Special Provincial Administration (ISPA) representing respectively the industry and local authority from Turkey.

EC FP Proposals submitted, but not funded

1. "*MIRAMAR*E: *Microseismicity and radon real time monitoring in the marine environment*". This STREP proposal was submitted to FP6 (Proposal No. FP6-036944) on 4th November 2005, with EMCOL as one of six partners undertaking the project activities in the Sea of Marmara.

2. "*EUTOP: **EU**ropean **T**sunami detection and early warning **O**perational **P**rototype***"*** a STREP project proposal. EMCOL is one of 15 partners in this project proposal to be submitted to EC-FP6 submitted by the end of April to call FP6-2005-IST-6.

3. "*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). This proposal was not considered eligible because its proposed budget exceeded the limit limit of 3.5 MEuro by 9 kEuro.

Funded international collaborative projects

1. "*Earthquake Risk Assesment in the Sea of Mamrara*". The project carried out by EMCOL and CNR-ISMAR, Bolgona, since August 2005. EMCOL is supported by the Istanbul Greated City Municipality (IBB) for this project. 3 project progress reports have been submitted. The final report is due on 15 December 2008.

2. "*MARNAUT" project: Study of relations between fluid venting, seismic activity and slope stability in the Sea of Marmara*". A collaborative project between College de France, IFRemere and EMCOL and other french institutions. The project involved a cruise onboard the R/V Le Atalante and dives by the research submersible *Nautil* to the North Anatolian Fault on the Marmara Sea floor, deployment of several OBS, tiltmeter, pore pressure meters and a sediment trap. The cruise took place 12 May-09 June 2007 and involved two legs 12-27 May and 27 May – 9 June, 2007. The co-chief of the French side was Pierre Henry from College de France. The co-chiefs from the Turkish side were Celal Şengör for the first leg and Namık Çağatay for the second leg. Several piston cores were taken for paelosismological purposes for EMCOL. They are being analyzed in the EMCOL Core Analyses Laboratory for the physical property and XRF core scanner analyses. EMCOL's scientists also carried out pore-water extraction and some onboard pore-water analysis, using EMCOL's equipment. Details of the MARNAUT project and cruise can found on web-sites:

http://cdf.u-3mrs.fr/~henry/marmara/
http://cdf.u-3mrs.fr/~henry/marmara/marnaut.html

3. "*Marine Environmental Assessment in the Eastern Mediterranean Sea*". The IAEA Regional Technical Cooperation project, RER/7/003. Namık Çağatay participated as an expert in the planning and coordination meetings of this project, held in Pula, Croatia and Vienna, Austria. Turkish Atomic Energy Commission (TAEK) decided to withdraw from this project. Therefore, EMCOL had to suspend its activities concerning the project starting project month 17.

4. *PaleoVan ICDP (International Continental Drilling Programme) project proposal on Lake Van*. EMCOL participated in the planning of the ICDP project proposal by attending in the "PaleoVan" workshop held in Van during June 6-9, 2006. EMCOL Coordinator Namık Çağatay is one of the four Proje Leaders. The drilling will start in 2009.

Proposals submitted for funding by national funding agencies

1. "*MARMESONET: Marmara Sea European Observatory Network"* has been submitted to IFREMER for funding. It has been recently positively evaluated. This project will study the ralationship between fluids and seismicity along the Sea of Maramra Fault system, and carry out site surveys for the implementation of permanent seafloor observatories in the Marmara Sea under the framework of the FP-6 ESONET project. The co-chiefs of this project are Louis Geli (IFREMER), Pierre Henry (College de France) and Namık Çağatay (ITU-EMCOL).

2. "*Paleoclimatic and environmental sedimentary records and neotectonic structure of Lake Van*" (Coordinator: Caner İmren). Proposal submitted to TUBITAK for funding.

3. "*The effects of the Mw7.4 Izmit earthquake on the Sea of Marmara environment: a paleoseismological/environmental approach*". Proposal submitted to TUBITAK on December 2006 and CNR for funding as bilateral intenational collaborative project. The project to be carried out by EMCOL, ISMAR Bologna and INGV, Rome. This proposal did not receive funding from TUBITAK according to a decision in April 2007.

Funded national projects

1. "*Late Quaternary geological evolution and paleoseismology of lake Iznik*" Field work was carried during September 2006 in the course of a collaborative project with Bonn University and Alfred Wegener Institute, Bremerhaven Two cores each exceeding 5 m length were recovered from Iznik

2. "*The archeological, geological and geophysical study of the underwater settlement in Lake Hazar, Elazığ*" (ITU Research Foundation project no: 31722). Emin Demirbağ, Hülya Kurt and Emre Damcı surveyed the Hazar Lake during 24 September-1 October, 2006 using EMCOL's INNOMAR subbottom profiler.

Graduate thesis and other projects funded by the university research foundation

1. Sea level changes in Sea of Marmara over the last 120 ka. PhD thesis project of Kadir Eriş (completed in November 2007).

2. Properties of seismoturbidites and their relations to earthquakes in the Central Basin of the Sea of Marmara. MSc thesis project of Deniz Dikçe (completed in March, 2008).

3. Holocene history of the Golden Horn Estuary, Istanbul. Msc thesis project of Nil Irvalı (completed in May 2008).

4. Paleoclimatic records in the Marmara and Black Seas over the last 20 ka". PhD thesis project of Ummuhan Sancar.

5. Palynological analysis in Anatolia north Aegean, and Black Sea: Vegetation and climate evolution over the last 24 Ma. PhD Thesis project of Demet Biltekin.

6. Holocene paleoclimatic records in the Hazar Lake (Elazığ). MSc thesis project of Gül Sürmelihindi.

7. Records of climate and tectonics driven changes in Göl Maramara (Manisa). PhD thesis project of Özlem Bulkan, funded by Istanbul University's Research Foundation.

8. Holocene climate records of lakes in western Anatolia" PhD thesis project of Sena Akçer.

Three of EMCOL graduate students (Kadir Eriş, Deniz Dikçe and Nil Irvali) graduated with MSc and PhD degrees, and others are close to graduation within next one or two semesters. Kadir Eris was offered an assistant professorship in Fırat University, Nil Irvali a PhD scholarship in Norway and Deniz Dikçe a position by a mining company. The fact that graduate students trained in EMCOL are desirable in the job market satisfies the fourth objective of EMCOL project: "*encouraging Turkey's trained scientists to remain in Turkey by offering desirable employment opportunities*".

As explained above, at the end of the EMCOL project all the project objectives have been achieved and deliverables satisfied (Table 1.2). The main outputs of the project are:

1. State-of-the-art research infrastructure

2. Well trained scientists

3. Increased EC level project participation in the fields of natural hazards and environmental changes in marine and lake basins.

Table 1.2: Deliverables list, giving date of submission and any proposed revision to plans.

Del. no.	Deliverable name	WP no.	Date due	Actual/Forecast delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
D1	Management meeting minutes recorded and placed on web	2	1 June 2005, then every month	1 June 2005, then every month	0		ITU
D2	Completion of Core Storage Room improvements	3	1 July 2005	1 November 2005	0		ITU
D3	Monthly web site updates of EMCOL's progress, availability for use, and employment opportunities	1, 2	1 July 2005, then every month	1 June 2005, then every month	0		ITU
D4	Creation of new research and employment opportunities for young researchers	4	1 July 2005-30 April 2008	18 project month (Oct. 2006)	0		ITU
D5	Selection and scheduling of training visits by experts	1	1 Sept 2005-30 April 2008	1 May 2006 – 30 April 2008	0		ITU
D6	Completion of Sedimentology Laboratory	3	1 November 2005	1 April 2006	0		ITU
D7	Completion of Wet Core Laboratory and Field Equipment Facility	3	1 November 2005	September 2006	0		ITU
D8	Organization of laboratory space and existing laboratory equipment	1	1 November 2005	1 February 2006	0		ITU
D9	Task leader written progress reports to coordinator	2	1 November 2005, then every six months	Nov. 2005 and May 2006/ every six months	0		ITU
D10	Completion of geochemistry laboratory	3	1 May 2006	1 May 2006	0		ITU

D11	Presentation of EMCOL's facilities & research at Open House and Orientation Week	2	April 2006, 2007 and 2008	10 April 2007	0		ITU
D12	Completion of Core Analysis Laboratory	3	1 November 2006	14 Febr. 2007	0		ITU
D13	Trained laboratory teams able to run EMCOL and output data for users	4	1 November 2006	Expected: April 2007	64		ITU
D14	Publication of the User Committee minutes	1	1 May 2007	27 April 2007	0		ITU
D15	Trained ESR in state-of-the art marine/lake research methods and increased networking with EU centres	4	1 November 2006 -30 April 2008	Expected between April 2007 -30 April 2008	64		ITU
D16	Advertising of EMCOL's facilities at international congresses with posters, brochures and meetings.	5	1 August 2005 – 30 April 2008	Throughout 2006 and 2007	0		ITU
D17	Two yearly reports and one final activity report submitted to the Commission by the project coordinator.	2	May 2006 and then every year	May 2006 and then every year	0		ITU
D18	At least one EU-FP proposal	5	30 April 2008	Expected before 30 April 08	0		ITU

***) if available**

1.3. Impact of the project on the industry and research sector

The first objective of EMCOL project was to establish state-of-the-art laboratory and field facilities that can be used extensively in research in the fields of natural hazards and environmental changes in marine and lake basins. The main facility of EMCOL in this respect is the EMCOL's *Core Analyses Laboratory* housing two major pieces of equipment: the Itrax Core scanner and Geotech Multi Sensor Core Logger (MSCL). These laboratory facilities, together field sampling facilities (platform and various corers) and seismic (subbottom) profiling equipment has already played and important role in ongoing EC FP projects, such as "*TRANSFER: Tsunami project*" and *"Seismic Cycles of the Anatolian Faults*" and international collaborative projects "*Earthquake Risk Assesment in the Sea of Marmara*" and "*MARNAUT*"

projects, as explained in Section 1.2. It also opened research opportunities in paleoclimate and paleoenvironmental research at a regional level, with the involvement of EMCOL in EC FP 7 projects and project proposals such as ESONET, EMSO, HYPOX and EMCLIME. A score of graduate students in ITU and Turkey are now encouraged to do graduate thesis research in the field of paleoclimatology and paleoceanography using the EMCOL facilities, as seen in the list of graduate thesis projects in Section 1.2.

EMCOL's research activities have increased the public and administrative awareness in natural hazards. Following the MARNAUT cruise, on 12 June 2007 Namık Çağatay and Naci Görür, together with the other cruise participant scientists Pierre Henry, Louis Geli, and Luca Gasperini, summoned the Governor of Istanbul (Mr. Güler) with the cruise results, and stressed the importance of multidisciplinary seafloor observatory stations for seismic (earthquake) monitoring in the Sea of Marmara. Mr. Mahmut Baş, Director of Foundation and Earthquake Department of the Istanbul Municipality, was also present at the meeting, during which EMCOL also submitted an official letter and a video footage summarizing the cruise findings and the need for observatory stations in the Sea of Marmara. The MARNAUT crusie was covered widely by the Turkish media.

During October 2007, the Istanbul Chamber of Industry (ISO) and Organization of Turkish Industrialists and Businessmen (TUSIAD) were contacted by Naci Görür on behalf of EMCOL for their support for permanent seafloor observatories in the Marmara Sea. These organizations have a lot at stake and dhowed considerable interest in the monitoring for geohazards in the Sea of Marmara. It is hoped that they would take a favourable decision to fund such research actions. Another potential group of organizations that would be interested in geohazard monitoring is the insurance companies who will be contacted in the near future in the framework of the EC FP ESONET NoE and EMSO projects.

Core Analyses Laboratory with its high resolution core analyses capabality would also be used by industries engaged in petroleum, civil and environmental engineering, because of the importance of core analyses in reservoir and source rock characterization and in geotechnical foundation characterization and environmental studies. For this reason, Turkish Petroleum Company (TPAO) geologists were invited to participate in the training course course on "Core Logging Methods in Marine Geology" by Dr. Jens Grützner of Bremen University (MARUM) during March 28-30, 2007. Three professionals were participated in the course and studied the capability of the facilities for their core analyses needs. A group of people from Istanbul Greater City Municipality visited the EMCOL facilities on 6 March 2007 on invitation. The EMCOL facilities were also visited by scientists and engineers in the field of petroleum and applied geology. It is anticipated that EMCOL facilities will be used by above-mentioned industries in future.

2. Final plan for using and disseminating the knowledge

Posters and brochures in Turkish and English were prepared starting with first year of the project. They were modified during the second year and presented and distributed in Career Days and national and international scientific meetings in the second and third years of the project (Figs. 29-33). As can be seen from the lists given below, the brokerage and publication activities of of EMCOL increased at a fast rate from the first year towards the end of the project.

During the three-year duration of the project, EMCOL published 5 peer-reviewed (SCI) publications, 6 books or book chapters, and a total of 46 paper presentations in 25 different meetings, presenting information on EMCOL and/or EMCOL's project results.

There has been also wide media coverage on EMCOL's project activities (Table A1). For example:

1. German TV channel *ZDF* visited EMCOL on Thursday, 1 March 2007 for a documentary on "Earthquake Risk in the Sea of Marmara" and "The Black Sea Flood". They filmed a core being analyzed in the EMCOL's Core Analysis Laboratory for the past earthquake records in the Sea of Marmara and a core from the Black Sea showing the record of the flood by the Mediterrranean waters. They also conducted an interview with Namık Çağatay

2. Turkish daily newspaper "Milliyet" reported on the EMCOL's collaborative MARNAUT project on 28 December 2006 (Fig. 37)

3. Turkish daily newspaper "Milliyet" reported on the EMCOL's EC FP 7 proposal "MARMSEALAB" on 23 April 2007.

4. Interview on earthquake risk in İstanbul by "*GEO*" magazine, 12 May 2007. This will be published in German, French and Turkish editions.

5. Turkish daily newpapers and TV channels widely covered during June 2008 the MARNAUT cruise that took place between 12 May and June 11, 2007 (Figs. 36, 37).

6. Press conference with Turkish media on the shores of the Lake Hazar in eastern Turkey on 28 July 2008. Information was given to the press on EMCOL's coring and seismic survey work in the lake within the framework of the EC FP Marie Curie Excellence Grant project "Seismic Cycles of the Anatolian Faults".

7. Interview in EMCOL facilities by "History TV Channel" on the "Black Sea Flood story", 6 March 2008.

8. Publication event of a popular science book "Journey to the Fault" by Naci Görür, 25 April 2008.

EMCOL Publications

EMCOL Peer-reviewed (SCI) Publications (2006-2007)

1. Çağatay, M.N., Görür, N., Flecker, R., Sakınç, M, Tünoğlu, T., Ellam, R., Krijgsman, W., Vincent,S., Dikbaş, A., 2006. Paratethyan – Mediterraenan connectivity in the Sea of Marmara region (NW Turkey) during the Messinian. Sedimentary Geology188-189: 171-188.

2. Demirbağ, E., Kurt, H., Düşünür, D., Sarıkavak, K., Çetin, S., 2007, Constructing a 3D structural block diagram of the Central Basin in Marmara Sea by means of bathymetric and seismic data, *Marine Geophysical Researches*, 28, 343-353.

3. Sarı, E. and Çağatay, M.N., 2006. Turbidites and their association with past earthquakes in the deep Çinarcik Basin of the Marmara Sea. Geo-Marine Letters, 1-8.

4. Eriş, K.K., Ryan, W.B.F., Çağatay, M.N., Sancar, U. Lericolais, G., Menot,G., Bard, E., 2007. The timing and evolution of the post-glacial transgression across the Sea of Marmara shelf south of Istanbul. Marine Geology, 243: 57-76.

5. Zitter, T.A.C. Henry, P. Aloisi, G. Delaygue, G. Çağatay, M.N. Mercier de Lepinay, B. Al-Samir, M. F. Fornacciari, M. Tesmer, A. Pekdeger, K. Wallmann, G. Lericolais 2008, Cold

seeps along the main Marmara fault in the Sea of Marmara (Turkey), Deep Sea Research Paret I, Volume 55:552-570.

Books and articles in books and monographs:

1. Çağatay, M.N., Suc, J-P, Clauzon, G., and Melinte-Dobrinescu, M.C., 2008. Messinian in northwest Turkey: Implications for paleogographic evolution and water mass exchange between Parathethys and Mediterranean. In: *The Messinian Salinity Crisis from Mega-Deposits to Microbiology - A Consensus Report,* CIESM Workshop Monographs 33, pp. 55-60.

2. Çağatay, N., Balkıs, N., Sancar, Ü., Çakır, Z., Yücesoy-Eryılmaz, F., Eryılmaz, M., Sarı, E., Erel, L., Akçer, S., Biltekin, D., tarihsiz [2006], *Marmara Denizi Çökel Jeokimyası Atlası (Sediment Geochemistry Atlas of the Sea of Martmara).*TÜBİTAK, Çevre, Atmosfer, Yer ve Deniz Bilimleri Araştırma Grubu, Ankara, vi+81 (A3) pp + 1 CD-ROM.

3. Clauson, G., Suc, J-P., Popescu, S-M, Melinte-Dobrinescu, M.C., Quilevere, F., Warny, S.E., Fauquette, S., Armijo, R., Meyer, B., Rubino, J-L., Lericolais, G., Gillet, H., Çağatay, M.N., Uçarkuş, G., Escarguel, G., Jouannic, G., Dalesme, F., 2008. Chronology of the Messinian events and paleogeography of the Mediterranean region. In: *The Messinian Salinity Crisis from Mega-Deposits to Microbiology - A Consensus Report,* CIESM Workshop Monographs 33, pp. 31-37.

4. Cochonat, P., Massom, D., Armigliato, A., Bornhold, B. Camerlenghi, A., Çağatay, N., Favali, P., Kvalstad, T., Kopf, Lykousis, V., Miranda, J.M., Person, R., Escalasans, R.U., 2007. History, monitoring and prediction of geohazards In: *Deep Sea-floor Frontier – An integrated Approach to Sstudy the Deep Sea Floor and its History*. EC Report, pp. 9-15.

5. Görür, N., 2008. *Bir Bilim Adamının Not Defterinden: Faya Seyahat. (A Journey to the Fault: From the Notebook of a Scientist.* Milliyet Yayınları, 129 pp.

6. Okay, A.I., Okay, N., 2007. Marmara Denizi'nin jeolojik durumu. (Geological aspects of the Sea of Marmara). In: "*Bilimsel Açıdan Marmara Denizi*", M.L. Artüz (ed.), Türkiye Barolar Birliği Yayınları, no.119, Ofset Hazırlık, İstanbul, pp.29-59.

Articles published in a weekly popular science and technology magazine

1. Çağatay, N. And Özeren, M.S., 2007. Earthquake research in the Marmara Sea: Preliminary results. Cumhuriyet Bilim Teknoloji, No.1057, 22 pp. 10-11., 22 June 2007.

2. Celal Şengör "Cumhuriyet Bilim ve Teknoloji" No. 1078/2, 16 Nov. 2007, "Sediment Geochemical Atlas of the Sea of Marmara" An article introducing the book with the same title, which is a product of the TUBITAK funded project work carried out by EMCOL.

3. Çağatay, N. et al., 2008. A new research centre in ITÜ: EMCOL (in Turkish). An article introducing EMCOL to Science community and general public was published in "Cumhuriyet Bilim ve Teknoloji", 15 February 2008, No. 1091, pp.10-11 (Fig. 33).

EMCOL papers presented at scientific meetings 46 papers in 25 meetings during the project period

1. Presentation of EMCOL with a poster and a power-point slide show in the Career Days of the Faculty of Mines during 1-3 March 2006.

2. Oral presentation of EMCOL by Namık Çağatay at the National Climate Meeting during 6-8 April, 2005.

3. Oral presentation of EMCOL at the EC-SSA project (INCO-CT-2004-003510) workshop "Clean Black Sea" in Varna in Bulgaria during 2-5 June 2005.

4. A poster presentation of EMCOL at the TURQUA (Turkish Quaternary) Symposium of EIES, 2-3 June 2005 in Istanbul.

5. A poer-point slide presentation of EMCOL at the annual coordination meeting of Turkish Marine Research at Navigation, Hydrography and Oceanography Department (SHOD) on 10 June 2005.

6. A power-point presentation of EMCOL in the planning and coordination meeting of IAEA RER project " Environmental Assesment of Eastern Mediterranean". In Pula Croatia in June 2006.

7. Oral and poster presentations of EMCOL and distribution of EMCOL brochures at "Geological Congress of Turkey", the Chambers of Geological Engineers, held in Ankara during 20-24 March 2006.

8. Poster presentation of EMCOL and distribution of EMCOL brochures at the EGU (European Geosciences Union) meeting (Session OS11) held in Vienna in 2-7 April 2006.

9. Çağatay, M.N. Okay, N. Genç, C. Demirbağ, E. Akkok,R., Özcan, E. Vardar, M. Tüysüz, O., 2007. EMCOL (Eastern Mediterranean Centre for Oceanography and Limnology): A new European research centre for natural hazards and environmental change studies. *38th Congress of CIESM* (Mediterranean Science Commission), İstanbul, 9-13 April, 2007. Oral presetnation with flyer distribution.

10. Çağatay, M.N. Okay, N. Genç, C. Demirbağ, E. Akkok,R., Özcan, E. Vardar, M. Tüysüz, O., 2007. EMCOL (Eastern Mediterranean Centre for Oceanography and Limnology): A new European research centre for natural hazards and envIronmental change studies. Turkish Geological Congress organized by the Chamber of the Turkish Geological Engineers (JMO), Ankara, Turkey, 16-22 April, 2007.

11. Çağatay, M.N., Balkıs, N. Çakır, Z., Sancar, Ü., Yücesoy-Eryılmaz, F., Eryılmaz, M., Sarı, E., Akçer, S., 2007. Sediment Geochemsitry Atlas of the Sea of Marmara. *38th Congress of CIESM* (Mediterranean Science Commission), İstanbul, 9-13 April, 2007.

12. A power point presentation of EMCOL to High level Univeristy officials and SHOD Director and scientists attending the CIESM Congress. This followed by visits to EMCOL facilities, marine community, 10 April, 2007 (Fig. 30).

13. Çağatay, M.N. and Görür, N., 2006. Late Quaternary stratigraphy and sedimentology of the Marmara Sea: implications for tectonic studies. International Workshop on "Comparative Studies of the NorthAnatolian Fault (Northwest Turkey) and the San Andreas Fault (Southern California), Istanbul, 14-18 August, 2006.

14. Çağatay, M.N., 2006. Late Quaternary sedimentary sequence of the Marmara Sea: Archives of tectonic rates and earthquakes". ATAG (Active Tectonics Research Group), Izmir, Turkey, 2-4 November, 2006.

15. Çağatay, N. Gasperini, L., Henry, P. The Sea of Marmara: An ımportant Observatory sıte for earthquake research and oceanographıc monitorıng. Poster presentation. Kick-off-Meeting of Esonet NoE project, Brest, France, 21-23 March 2007.

16. Çağatay, M.N., Balkıs, N. Çakır, Z., Sancar, Ü., Yücesoy-Eryılmaz, F., Eryılmaz, M., Sarı, E., Akçer, S., 2007. Marmara Denizi Sediment Jeokimyası Atlası (Sediment Geochemsitry Atlas of the Sea of Marmara) . Turkish Geological Congress organized by the Chamber of the Turkish Geological Engineers (JMO), Ankara, Turkey, 16-22 April, 2007.

17. Sancar, Ü. and Çağatay, N., 2007. Sedimentary paleoclimatic records in the Black Sea during the last nine thousand years. Turkish Geological Congress organized by the Chamber of the Turkish Geological Engineers (JMO), Ankara, Turkey, 16-22 April, 2007.

18. Erel, L. and , Çağatay, N., 2007. Morphological features and history of some isthmuses in the Marmara and Aegean Seas. Turkish Geological Congress organized by the Chamber of the Turkish Geologiãal Engineers (JMO), Ankara, Turkey, 16-22 April, 2007.Turkish Geological Congress organized by the Chamber of the Turkish Geological Engineers (JMO), Ankara, Turkey, 16-22 April, 2007.

19. Boës, X., Ulas, A., King, J., Çağatay, N., Hubert Ferrari, A. 2007. Assessment of lake sediment sensitivity to earthquakes and climate cycles along the North Anatolian Fault. European Geosciences Union General Assembly 2007. Vienna, Austria, 15-20 April 2007.

20. Hubert-Ferrari, A. Boës, X., Fraser, J., Avsar, U., Vanneste, K., Çağatay, N., Altunel , E., de Batist), M. Fagel, N. 2007. Understanding the irregularity of Seismic cycles: A Case study in Turkey- A Marie Curie Excellence Team Project. European Geosciences Union (EGU) General Assembly 2007, Vienna, Austria, 15-20 April 2007.

21. Çağatay, M.N., 2007. Seismoturbidites in the Sea of Marmara". IODP (Integrated Ocean Drilling Program) Workshop on Geohazards, held in Portland, Oregon, USA, during 26-30 August 2007.

22. Çağatay, M.N. 2007. The Sea of Marmara: an important seafloor observatory site for earthquake, landslide and oceanographic studies". ESONET All Regions Workshop" held in Barcelona during 5-7 September 2007.

23. Çağatay, M.N., Geli, L., Henry, P., 2008. ESONET Demonstration Mission project in the Sea of Marmara. ESONET first training workshop, Bremen, 27-28 January 2008.

24. Acar, D. 2008. New ideas on sediment coring. Poster presentation. ESONET first training workshop, Bremen, 27-28 January 2008.

25. Damcı, E., Demirbağ, E., Sarıkavak, K., 2008. Interpretation of seismic reflection data from offshore Bartın-Amasra (Black Sea). ESONET first training workshop, Bremen, 27-28 January 2008.

26. Henry, P. Zitter, T.A.C., Le Pichon, X., Geli, L., Tryon, M. D., Mercier de Lepinay, B., Cagatay, M. N., Sengor, A.M.C., Gorur, N., Bourlange S. and the Marnaut Scientific Party, Cold seeps in the North Anatolian Fault zone, Sea of Marmara: hints for a deep connection. Presented at EGU meeting, Vienna, 2008.

27. Çağatay, M.N., Belucci, L. Polonia, A. Sancar, U. Dikçe, D. Eriş, K. Damci, E., Gasperini, L. Gorur, N. Henry, P. Zitter, T.A.C. Geli, L. Tryon, M., 2008. Sedimentary earhquake records in the Sea of Marmara, Presented at EGU meeting, Vienna, 2008.

28. Özeren, M. S. Çağatay, N. Şengör, A.M. C. Görür, N. Zitter, T, Henry, P., Gasperini, L., Eris, K., Postacioglu, N., Geli, L., Sultan, N. 2008. Submarine landslide risk in the Sea of Marmara revisited after Marnaut cruise. Presented at EGU meeting,Vienna, 2008.

29. Altinok, Y., Çağatay, N.M., Alpar, B., Akcer, S., Ozer, N., Sancar, U**.,** Damci, E., Acar, D., Ceylan, S., Agor, H. 2008. Investigation of paleotsunami deposits in the cores of Kucukcekmece Lagoon, Sea of Marmara, Turkey. EGU 2008, Vienna Poster: XY0389.

30. Boës, X; Moran, B; Roger, K; Ulas, A; Moernaut, J; King, J; Cagatay, N; Hubert Ferrari, A Radionuclide profiles and recent earthquakes history of Lake Hazar Pull-apart basin (East Anatolian Fault, Turkey). EGU 2008, Vienna Poster: XY0232.

31. Henry, P. Zitter, T.A.C., Le Pichon, X. Sengor, A.M.C. Çağatay, N., Gasperini, L. Geli, L.Tryon, M. D. Mercier de Lepinay, B., and the Marnaut Scientific Party, Manned submersible observations at cold seeps in the North Anatolian Fault zone, Sea of Marmara, AGU Fall meeting, San Francisco, 10-14 December, 2008.

32. Geli, L. Henry, P. Dupré, S. Volker, D. Zitter*, T.A.C. Le Pichon, X. Tryon, M. D. Çağatay, M. N. and the Marnaut Scientific Party, Acoustic detection of gas emissions within the submerged section of the North Anatolian Fault zone in the Sea of Marmara, AGU Fall meeting, San Francisco, 10-14 December, 2008.

33. Tryon, M. D., Çağatay, M. N., Henry, P., Zitter, T.A.C., Geli, L. Charlou J.-L. and the Marnaut Scientific Party, Pore fluid chemistry of cold seeps in the Sea of Marmara, AGU Fall meeting, San Francisco, 10-14 December, 2008.

34. Henry, P. Zitter, T.A.C., Le Pichon, X., Sengor, A.M.C., Gorur, N. Cagatay, N. Gasperini, L. Geli, L., Tryon, M. D., Mercier de Lepinay, B., and the Marnaut Scientific Party, Manned submersible observations at cold seeps in the North Anatolian Fault zone, Sea of Marmara. Presented at Geological Congress of Turkey 2008, Ankara, Turkey.

35. Geli, L. Henry,P. Dupré , S. Volker, D. Zitter, T. Le Pichon, X. Tryon, M. Çağatay, N. and the Marnaut Scientific Party, 2008. Acoustic detection of gas emissions within the submerged section of the North Anatolian Fault zone in the Sea of Marmara. Presented at Geological Congress of Turkey 2008, Ankara, Turkey.

36. Görür, N., Özeren, S., Çağatay, N., Şengör, C., and the Marnaut Scientific Party, 2008. Geological observations of the Marnaut dives north of the Çınarcık Basin and their implications. Presented at Geological Congress of Turkey 2008, Ankara, Turkey.

37. Çağatay, M.N., Sancar, Ü. Henry, P. Gasperini, L. Tryon, M. Dikçe, D. and the Marnaut Scientific Party, Origin of the black Sulphidic Patches Along the Main Marmara Fault and their tectonic and paleoseismological implications. Presented at Geological Congress of Turkey 2008, Ankara, Turkey.

38. Biltekin, D., Popescu, S-P, Boro, S., Suc, S-P., 2008. High Resolution Climate and vegetation records of Anatolia during Late Miocene to Late Pleistocene Period from Pollen Analyses of Sedimentary Sequence at DSDP 380 Site in the Black Sea. Presented at Geological Congress of Turkey 2008, Ankara, Turkey.

39. Eriş, K.K. and Çağatay, M.N., 2008. Middle Pleistocene to Recent sealevel changes in the Sea of Marmara and water exchange with the Mediterranean and Black seas. Poster presented at Geological Congress of Turkey 2008, Ankara, Turkey.

40. Çağatay, M.N., Eriş, K., Sancar, Ü., Biltekin, D., Akçer, S., 2007.Late Quaternary Paleoceanography of the Marmara Sea. Geology of Istanbul Symposium, organized by the Chamber of the Turkish Geological Engineers, 7-9 December, 2007 in Istanbul.

41. Çağatay,M.N., Balkıs, N. , Sancar, Ü. Çakır, Z., Yücesoy-Eryılmaz, F., Eryılmaz, M., Sarı, E., Erel, L., Akçer, S, Biltekin, D., 2007. Sediment geochemsistry Atlas of the Sea of Marmara

and its importance in pollution and ecological studies. Intern. Workshop on the role of Climatic and Anthropogenic Changes in Marine Eco Systems,18-20 October 2007, Izmir , Turkey.

42. Çağatay, M.N., Sancar, Ü., Damcı, E., Eriş, K, Erel, L., 2007. Turbidites in the Sea of Marmara and their palosismological significance in Turkish). 6th TURQUA Symposium,16-18 May, 2007. Istanbul.

43. Sancar, Ü., Çağatay ,M. N. 2007. Sedimentary paleoclimate records of the last 9,000 years. in the Black Sea in Turkish). 6th TURQUA Symposium, 16-18 May, 2007. Istanbul.

44. Eriş, K.K., Ryan, W.B.F., Çağatay, M.N., Sancar, U. Lericolais, G., Menot,G., Bard, E., 2007. The timing and evolution of the post-glacial traqnsgression across the Sea of Marmara shelf south of Istanbul in Turkish). 6th TURQUA Symposium, 16-18 May, 2007. Istanbul.

55. Dikçe, D., Çağatay, M. N., Sancar,Ü. 2007. Properties of seismoturbidites in the Central Basin of the Sea of Marmara and their relations to historical earthquakes (in Turkish). Poster presentation. 6th TURQUA Symposium, 16-18 May, 2007. Istanbul.

46. Erel, L.T., Çağatay, M.N., Zabci, C., Akyüz., H.S., 2008. Histroical earthquakes of İzmit and surrounding region (in Turkish). DAYK Symposium 19-22 March 2008, Sakarya.

Table A1. Overview table for dissemination of knowledge about EMCOL

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
/May/05	*Press release in news-paper "Referans"*	*Industry/ General public*	Turkey	*10000*	*ITU*
6-8 April, 2005.	*Conference* National Climate Meeting	*Research*	EU & AC	*35*	*ITU*
2-3 June 2005	Poster:TURQUA (Turkish Quaternary) Symposium	*Research*	Turkey	*100*	*ITU*
2-5 June 2005	Oral presentation: EC-SSA workshop "Clean Black Sea" in Varna, Bulgaria	*Research*	EC & AC	*30*	*ITU*
10 June 2005	Ann. Coord. meeting of Turkish Marine Research at SHOD	*Research*	Turkey	*30*	*ITU*
1-3 March 2006	Poster, Slide show: Career Days of the Faculty of Mines	*Higher educaiion, Research, Industry*	Turkey	*200*	*ITU*
20-24 March 2006	Poster and Oral presentation at Geological Congress of Turkey	*Research*	Turkey	*100*	*ITU*
2-7 April 2006.	Poster and flyers: EGU (European Geosciences Union) meeting (Session OS11)	*Research*	EC	*6000*	*ITU*
17 April 2006	Departmental Seminar on EMCOL facilities and activities	*Higher Education and Research*	Turkey	*35*	*ITU*
March 2006-May-2008	*Publications (see list of publications in text)*	*Proceedings of the above scientific meetings included an abstract on*	All		*ITU*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
		EMCOL			
28 Decem. 2006	Report in Turkish daily newspaper ”Milliyet”	*Public*	Turkey	*300,000*	*ITU*
1 March 2007	German TV ZDF Interview in EMCOL	*Public*	Germany	*Several tens of million*	*ITU*
23 April 2007	Report in Turkish daily newspaper ”Milliyet”	*Public*	Turkey	*Several tens of million*	*ITU*
14-18 August, 2006.	International Workshop on “Comparative Studies of the NAF, Turkey and SAF Southern California”, Istanbul.	*Research*	EU, USA& AC	*60*	*ITU*
22-4 November, 2006	ATAG (Active Tectonics Research Group), Izmir, Turkey.	*Research*	Turkey	*100*	*ITU*
21-23 March 2007.	Kick-off-Meeting of Esonet, Brest, France	*Research*		*35*	*ITU*
10 April 2007	Introductory EMCOL meeting in ITU	*Research and Education*	Turkey& EC	*50*	*ITU*
9-13 April, 2007	*38th Congress of CIESM* (Mediterranean Science Comm.), Istanbul.	*Research*	EC & AC	*30*	*ITU*
15-20 April 2007.	European Geosciences Union (EGU) General Assembly 2007, Vienna, Austria.,	*Research*	EC& AC	*200*	*ITU*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
16-22 April, 2007	Geological Congress of Turkey , Ankara, Turkey	*Research*	Turkey	*30*	*ITU*
13/05/2007	*Press: Newspaper "Vatan"*	*General public*	Turkey	*200,000*	*ITU*
13/05/2007	*Press: Newspaper "Star"*	*General public*	Turkey	*200,000*	*ITU*
14/05/2007	*Press: Newspaper "Milliyet"*	*General public*	Turkey	*500,000*	*ITU*
22/06/2007	*Popular Science and Tecnology Magazine: Cumhuriyet Bilim Teknoloji"*	*General Public*	Turkey	*300,000*	*ITU*
12 May 2008	*Popular science magazine GEO*	*General Public*	Turkey, France, Germany	*10,000*	*ITU*
June 2008	*Interview in EMCOL*	*Teknoloji TV channel*	Turkey	*100.000*	*ITU*
June 2008	*Film/video*	*Other TV channels*	Turkey	*10,000*	*ITU*
May 2007-May 2008	*Conference: 26 scientific papers presented in 10 different meetings*	*Research*	All		*ITU*
28 July 2007	*Press conference on in Lake Hazar on EMCOL's work on the Lake*	*General public*	Turkish	*Severel hundred thousand*	*ITU*
6 March 2008	*History Channel (TV) interview and filming in EMCOL labs*	*General Public*	All	*Millions*	*ITU*
22 June 2007.	*An article on Earthquake research in the Marmara Sea: Preliminary results in popular journal "Cumhuriyet Bilim ve*	*General public*	Turkish	*100,000*	*ITU*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
	Teknoloji"				
16 Nov. 2007	*An article on EMCOL's project " Sediment Gechemistry Atlas of the Sea of Mamrara" in Cumhuriyet Bilim ve Teknoloji*	*General public*	Turkish	*100,000*	*ITU*
15 Feb. 2008	*Article on EMCOL in the weekly popular science/technology magazine "Cumhuriyet Bilim ve Teknoloji"*	*General Public*	Turkish	*100,000*	*ITU*
April 2008	*Popular Science book "Journey to the Fault"*	*General Public*	Turkish	*2000*	*ITU*
1 May 2007-30 April 2008	*Publications: 4 peer-reviewed papers,3 in monongraphs*	*Research*	All	*> 1000*	*ITU*
May 2005-Present	*Project web-site: www.emcol.itu.edu.tr*	*General public*	All	*5000*	*ITU*
May 2007-April 2008	*6 Posters presented in three different scientific meetings (see list in the text)*	*Research*	All	*2000*	*ITU*
March 2006-May 2008	*Flyers distributed in various meetings and to visitors in EMCOL*	*Public and research*	All	*150*	*ITU*
Sept 2006-May 2008	*Direct e-mailing*	*Scientific*	All	*1000*	*ITU*
From May 2005	Project web-site	*www.emcol.itu.edu.tr*	All		*ITU*

Fig. 29. EMCOL's posters displayed outside the EMCOL student office.

Fig. 30. Namık Çağatay (EMCOL coordinator) introduces EMCOL and its labs to the ITU administration and other invited guests from SHOD, MTA and scientists from the CIESM Congress, 10 April 2007.

Doğu Akdeniz Oşinografi ve Limnoloji Merkezi
(Eastern Mediterranean Centre of Oceanography & Limnology)

www.mines.itu.edu.tr/emcol

EMCOL: Doğu Akdeniz Oşinografi ve Limnoloji Merkezi

Doğal Afetler ve Çevre Değişimleri Çalışmaları İçin Yeni Bir Araştırma Altyapısı

EMCOL (Doğu Akdeniz Oşinografi ve Limnoloji Merkezi) 3 yıllığına FP6-2004-ACC-SSA-2 Pojesi (Contract No: 17490) tarafından desteklenen bir araştırma merkezi olup faaliyetlerine Mayıs, 2005 tarihinden itibaren başlamıştır. EMCOL fiziksel olarak İTÜ bünyesinde Maden Fakültesi Binası içerisinde konuşlandırılmıştır. Bu merkezin ana amaçları şunlardır;

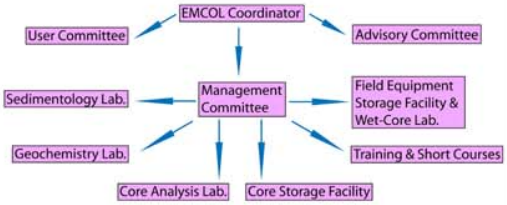
1. Deprem, heyelan, tsunami, taşkın, iklim değişimleri ve çevre kirlenmesi gibi doğal afetler ve çevresel değişim konularında göl ve deniz araştırmaları için laboratuar ve arazi ekipmanı alt yapısını oluşturmak,
2. Doğal afetler ve çevresel değişimler konularında çalışacak genç araştırmacılar yetiştirmek,
3. Türkiye ile Avrupa ülkeleri arasındaki bilimsel faaliyet ve proje girişimlerini arttırmaktır.

EMCOL'un genel yapısı ve yönetim düzeni Şekil 1' de gösterildiği gibidir.

EMCOL koordinatörü: Prof. Dr. Namık ÇAĞATAY
Danışma Komitesi: Dr. Frank NIESSEN, Prof. Dr. Temel OĞUZ, Amiral Nazım ÇUBUKÇU, Kerim SARIKAVAK
Yürütme Komitesi: Prof. Dr. Mahir VARDAR, Prof. Dr. Remzi AKKÖK, Prof. Dr. Okan TÜYSÜZ, Prof. Dr. Ş. Can Genç, Prof. Dr. Emin DEMİRBAĞ, Y.Doç. Dr. Nilgün OKAY, Y. Doç. Dr. Lisa DONER

EMCOL Laboratuarları ve Arazi Olanakları şunları kapsamaktadır;

1. Karot Analiz Laboratuarı
2. Sedimentoloji Laboratuarı
3. Jeokimya Laboratuarı
4. Soğuk Karot Deposu
5. Arazi Ekipmanları Deposu

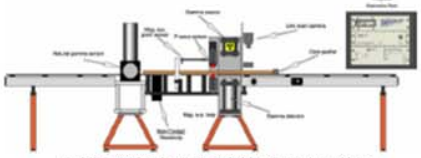


Şekil 1. EMCOL yapısı ve yönetim düzeni

Karot Analiz Laboratuarında başlıca COX System'in ITRAX Karot Tarayıcısı ve GEOTEK'in Yüksek Çözünürlüklü Karot Log Alıcısı (Multisensor Core Logger). ITRAX Karot Tarayıcısı XRF, sayısal X-Işını Radyografisi ve sayısal görüntüleme sistemi ile donatılmış bir cihazdır (Şekil 2).

Şekil 2. COX System'in ITRAX Karot Tarayıcısı.

Yüksek Çözünürlüklü Karot Log alıcısı, karotlar üzerinde P-dalgası hızı, manyetik duyarlılık ve elektrik özdirenç ölçümlerinin yapılmasına olanak veren otomatik bir cihazdır (Şekil 3).



Şekil 3. Yüksek çözünürlüklü Karot Log Alıcısı.

Şekil 4. Tane/parça boyu analizleri için ekipman

Şekil 5. Toplam karbor analizleri için ekipman (Shimadzu TOC-VWS)

EMCOL'un sedimentoloji laboratuarındaki ekipmanlar ve yapılabilecek analizler şu şekilde sıralanabilir;

1. Lazer saçınımlı tane boyu analizi ve standart elek analizi ile tane boyu analizleri (Şekil 4)
2. Kil ve mikrofosil ayrımları için yüksek hızda sentrifüj
3. Örnek homojenleştirme işlemleri yapılabilmektedir.

Soğuk Karot Deposu;
Deniz ve göl çalışmalarından elde edilen karotların +4°C de saklandığı, ısı alarm sistemli bir soğuk depo/laboratuar niteliğindedir. 1m lik karotlar için toplam 210 adet yatay depolama (Şekil 6), 2m uzunluktaki karotlar için de düşey depolama imkanı vardır. Laboratuar ısı alarm sistemi ve kayıtçısı ile donatılmıştır.

Şekil 6. Karot depolama biriminden bir görünüm.

EMCOL'un arazide çalışma kapasitesi ve imkanları;
1. Surveying ve sediman örnekleme teçhizatları: Sub-bottom profil alma (Chirp-tipi sismik yansıma) cihazı, Differential GPS (GSI Wireless PowerMax), CTD ve çeşitli göl ve deniz çökel karotiyerleri (gravite, kajak, Livingstone-tipi piston ile karot alıcılar, Ekman kepçe)

2. Su Kolonu Örnekleme teçhizatları: Göl çalışmaları için sediman kapanı (20 adet) (Şekil 8)

3. Diğer Destek teçhizatları: Platform (4m x 3.5 m) & tripod (Şekil 9), yerli yerinde jeofizik testler için 4 çeker arazi aracı, Küçük bot ve motoru.

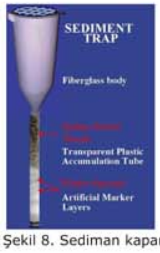
Jeokimya Laboratuarı;
1. Toplam karbon, inorganik ve organik karbon analizleri (Shimadzu TOC VWS/VWP, Şekil 5),
2. Duraylı izotop analizleri için örnek hazırlama işlemleri
3. Foraminifer, polen, biojenik silica, diatome ve ostracoda'lar için fosil hazırlama işlemleri için gerekli cihazlarının bulunduğu bir laboratuar niteliğindedir.

Arazi Ekipmanları Depolama Ünitesi ve Islak Karot Labortuarı, arazi deneyleri ve örnek alım aletlerinin depolandığı alanlar ve ıslak karotlar üzerinde yapılabilecek testlerin gerçekleştirildiği bir birimdir.
Islak karot laboratuarında;
1. Karot ayrımı
2. Fotoğraflama ve tanımlama (Şekil 7)
3. Örnekler üzerinde Jeoteknik testler
4. Islak örnek elek analizleri yapılabilmektedir.

Şekil 7. Karot tanımlama işlemleri sırasında

EMCOL kurulumundan itibaren proje bazlı çalışmaya önem ve öncelik vermiştir. Bu bağlamda, bazı projeler alınmış, bazıları da planlanmıştır. Aşağıda bunlardan bir kısmı görülmektedir;

1. Marmara Denizi'nde deprem riskinin belirlenmesi ve değerlendirilmesi (İstanbul Büyükşehir Belediye Başkanlığı tarafından desteklenen bu proje, CNR Deniz Jeoloji Enstitüsü (CNR-ISMAR, Italy) İtalya ile ortaklaşa yürütülmektedir.
2. İSKİ-İstanbul destekli yapılacak olan "İSKİ içmesuyu kaynakları üzerinde doğal ve antropojenik risklerin incelenmesi" projesi.
3. ESONET: Avrupa Denizlerini Gözlem Ağı projesinin Marmara Denizi kısmı.
4. Megakent İstanbul'da yakın gelecekte oluşabilecek su krizinin risk analizi projesi (Amerikan Ulusal Bilim Vakfı -NSF Projesi)
5. EMCOL, Van gölünde çalışmalar yürütmek üzere ICDP (Uluslararası Kıtaları Delme Projesi) de yer almak istemektedir ve bu kapsamda Haziran-2006'da yapılacak olan çalıştaya davet edilmiştir.



Şekil 8. Sediman kapanı

Şekil 9. Göl çalışmaları için örnek alma ekipmanları bir çalışma sırasında.

EMCOL yukarıda tarif edilen deniz ve göl araştırmalarında analitik verilerin üretilebileceği yüksek standartlı, yeni, tümüyle otomatik ve halen ileri batı ülkelerinde uygulanan yöntemler ve kullanılan ekipmanlarla donatılmış bir merkezdir. EMCOL yurt içi ve yurt dışından gelebilecek projelere açıktır.

Fig. 31. EMCOL poster presented in the career days of ITU, Faculty of Mines and in Geological Congress of Turkey in Ankara, 20-24 March 2006

EAST MEDITERRANEAN CENTRE FOR OCEANOGRAPHY & LIMNOLOGY

Namık CAĞATAY, Nilgün OKAY, Can GENÇ, Emin DEMİRBAĞ, Mahir VARDAR, Okan TÜYSÜZ

İTÜ EMCOL, İSTANBUL, TURKEY
http://www.emcol.itu.edu.tr/
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EMCOL's Objectives

EMCOL is designed to combine the trained scientists in Istanbul Technical University (ITU) with advanced field and laboratory facilities for marine and lake studies. EMCOL houses, administers and utilises the upgraded facilities and train new researchers in advanced methodologies in marine geology-geophysics, paleoceanography and limnology (Figs.1, 2).

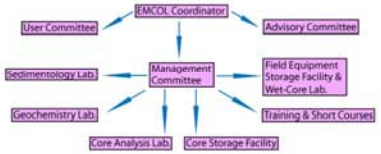


Fig.1. EMCOL's organizational structure

A new 3-year FP6-2004-ACC-SSA-2 project (Contract No. 17490) has been initiated at İstanbul Technical University with the following main objectives:

1. To establish state-of-the-art laboratory and field infrastructure that will be used extensively in marine and lake studies, including natural hazards and environmental changes, so that the output will be comparable with that from European, American, and other worldwide centres of excellence,

Fig. 2. One of EMCOL's short course

2. To develop highly qualified first- and second-generation researchers in interdisciplinary marine and lake studies at ITU, covering a wide range the fields such as underwater earthquake geology, tsunamis, submarine land slides, floods, climate change and environmental pollution (Figs. 3, 4).

3. To enhance interactions in projects and idea exchanges between ITU researchers and those in the EU countries.

EMCOL serves the needs of researchers working in the Eastern Mediterranean regions in the areas of natural hazards and environmental change, involving imaging of sea and lake sediments and analyzing important proxies in sediment cores.

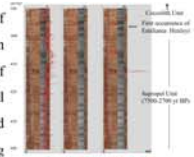


Fig.3. XRF core-scanner records of climatic changes in the Black Sea

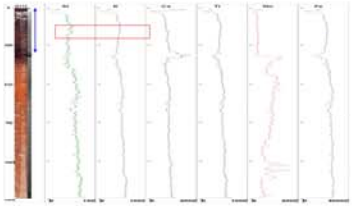


Fig.4. XRF core scanner records of 1999 Earthquake in the İzmit Gulf

With the EMCOL facilities it is possible to map active faults and submarine landslides, determine high resolution records of past earthquakes and tsunamis that are essential for earthquake and tsunami risk assessment. The same facilities can also be used for determination of the high resolution sediment records of sea-level, climate and ecological changes.

Fig.5. Multi Sensor Core Logger

The EMCOL's laboratories and field facilities:

1. Core Analyses Laboratory housing: (i) ITRAX Core scanner for sub-mm-scale resolution XRF analyses, digital X-ray radiography and color scanning of cores, (ii) MSCL core logger with magnetic susceptibility, p-wave, gamma ray and electrical resistivity sensors (Figs. 5, 6).

Fig.6. ITRAX XRF Core Scanner in the Core Analysis Laboratory

2. Sedimentology Laboratory, with freeze dryer, laser diffraction grain size analyzer and mechanical sifter, smear slide preparatiron and optical microscopy (Fig 7).

3. Geochemistry Laboratory with TOC/TIC analyzer.

Fig.7. Sedimentology Laboratory

4. Wet Core laboratory for sample description, digital photography, geomechanical tests, descrete sampling, and wet-sieving for microfossils.

5. Cold Core Storage Room for storing and archiving sediment cores at 4°C.

6. Field facilities include, various corers, subbuttom profiler, CTD, a platform for lake sampling, 6 m boat and R/V Sismik I (Fig.8.),

Fig.8. İTÜ-EMCOL Boat & R/V Sismik I

All EMCOL'S facilities are available for research groups. You can follow all developments on the EMCOL the web-site (http://www.emcol.itu.edu.tr), concerning the laboratories, equipment and training courses.

Projects

Partnership in EC FP projects:

1. EMCOL: Eastern Mediterranean Centre for Oceanography and Limnology. EC FP6 SSA project Contract No. 017490. Coordinator: Namık Çağatay.

2. The ESONET "European Sea Observatory Network" project (FP6-2005-GLOBAL-4, Contract N° 036851-2) coordinated by Roland Person of IFREMER. EMCOL is a partner of this 4 year project that started 1. March 2007. Sea of Marmara is included as site of interest.

3. Seismic Cycles of the Anatolian Faults" (EC-Marie Curie Excellence Grant (MEXTCT-2005-025617, Coordinator: Dr. Aurelia Hubert-Ferrari of Brussels Royal Observatory). EMCOL is a sub-contractor. Collaboration includes study of earthquake and climate records in lake sediments using EMCOL's facilities.

Collaborative international projects

4. "Earthquake Risk Assessment in the Marmara Sea" EMCOL-CNR-ISMAR Marine Geology Institute, Bologna, Italy . EMCOL is supported by Istanbul Municipality.

5. "Marmara seafloor observation station", funded by Istanbul Greater City Municipality (IBB) The project involves deployment of a multisensor observatory as a joint effort by EMCOL, ISMAR-Bologna, and INGV, Rome.

6. MARNAUT" project: Study of the relationship between fluid flow and seismotectonic activity along the NAF in the Sea of Marmara" in collaboration with the College de France, IFREMER and other institutions. This project involves a cruise onboard the R/V Le Atalante and dives by the research submersible Nautil during 12 May - 9 June, 2007.

4 PhD and 4 Msc thesis projects using EMCOL facilities.

Fig. 32. EMCOL poster displayed at international meetings

Cumhuriyet

Cumhuriyet BİLİM TEKNOLOJİ 21. YIL

15 Şubat 2008 Yıl: 21 Sayı: 1091

İTÜ'de yeni bir araştırma merkezi: EMCOL

Doğal Afetler ve Çevresel Değişimler Konusunda Yeni bir Araştırma Merkezi: EMCOL (Eastern Mediterranean Centre of Oceanography = Doğu Akdeniz Oşinografi ve Limnoloji Araştırmaları Merkezi)

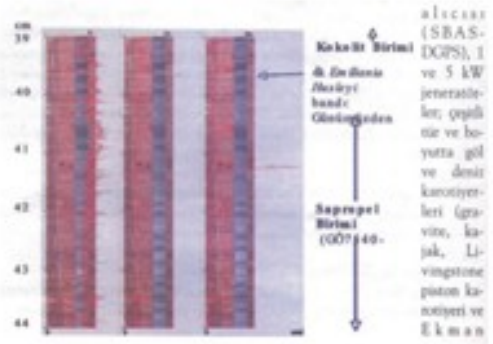
EMCOL Araştırma Merkezi, İstanbul Teknik Üniversitesi'nde Namık Çağatay koordinatörlüğünde Avrupa Birliği 6. Çerçeve Projesi (FP6-ACC-SSA-2, no: 17490) desteği ile doğal afetler ve çevresel değişimler konularında temel araştırmalar yapmak üzere, üst düzeyde laboratuvar ve arazi donanımına sahip bir araştırma merkezi olarak kuruldu.

Öncelikli araştırma alanları ve amaçları; başta deniz ve göllerde deprem, heyelan, tsunami, iklim değişimleri ve çevre kirliliği konularında araştırmalar olmak üzere bunların temel bilimsel ve mühendislik uygulamalarına bir altyapı oluşturmak, bu alanlarda genç araştırmacılar yetiştirmek, ülkemizden araştırmacıların Avrupa Birliği projelerine etkin katılımını mevcut arazi aletleri havuzu ve laboratuvar olanaklarıyla desteklemek, yurtdışından ülkemize gelerek araştırmada bulunan araştırmacılara proje bazında araştırma imkânları sağlamak.

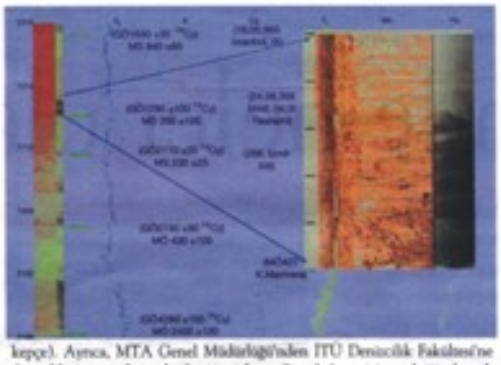
EMCOL Araştırma Merkezi'nin araştırmacılara sunduğu başlıca imkânları Karot Analiz Laboratuvarı, Sedimentoloji Laboratuvarı, Jeokimya Laboratuvarı, Soğuk Karot Deposu ve Arazi Aletleri Havuzu oluşturmakta.

Laboratuvarlarda sayısal görüntüleme sistemi, karot tanımlama, değişik amaçlar için örnek hazırlama ve sulu eleme işlemleri de yapılabilmektedir.

EMCOL Araştırma Merkezi modern bir Arazi Aletleri Havuzu ile donatılı. Bu havuzda bulunan başlıca donanımlar: deniz ve göl çalışmalarında kullanılan 6.5 metre boyunda, yarım kamara, dıştan takma benzin motorlu bir tekne; yüksek çözünürlüklü sığ sismik yansıma sistemi; göllerde karot almak üzere ücretsiz sal, sıcaklık, tuzluluk ve derinlik ölçer (CTD), uydu tabanlı GPS



alıcısı (SBAS-DGPS), 1 ve 5 kW jeneratörler; çeşitli tür ve boyutta göl ve deniz karotiyerleri (gravite, kajak, Livingstone piston karotiyeri ve Ekman kepçe). Ayrıca, MTA Genel Müdürlüğü'nden İTÜ Denizcilik Fakültesi'ne devredilen ve yenilenerek işletmeye alınan Sismik-1 gemisi, gerektiğinde açık deniz çalışmalarında kullanılmakta.



Merkez kısa süre içinde uluslararası AB Çerçeve Programı (FP) kapsamında projelere ortak olarak katıldı. Bunlardan en önemlileri: ESONET "European Sea Observatory Network" (FP6-2005-GLOBAL-4, Contract N° 036851-1) ve EMSO "European Multidisciplinary Seafloor Observation" (INFRA-2007-2.2.1.8 FP7-2007) projeleridir. Bunlardan EMSO ülkemizin şu anda üye olduğu ilk ve tek Avrupa Bilim Altyapıları (ESFRI) projesidir.

Ayrıca "Seismic Cycles of the Anatolian Faults" başlıklı Marie Curie Excellence Grant (MEXTCT-2005-025617, Koordinatör: Aurelia Hubert-Ferrari) projesi ve Transfer "Tsunami Risk and Strategies For the European Region" (Koordinatör: Dr. **S.Tinti** ve İ.Ü. sorumlusu Prof. Dr. **Yıldız Altınok**) projesinin arazi çalışmaları ve laboratuvar analizleri EMCOL Araştırma Merkezi imkânları kullanılarak yapılmakta. Fransız araştırma kurumlarıyla birlikte Marmara Denizi'nde L'Atalante gemisi ve Nautile araştırma denizaltısı ile 2007 yılı yaz mevsiminde yapılan araştırmalarda EMCOL Araştırma Merkezi önemli görevler üstlendi.

Son iki yıldır İstanbul Büyükşehir Belediyesi tarafından desteklenen "Marmara Denizi'nde Deprem Riskinin Değerlendirilmesi" başlıklı proje yürütülmekte. Bu proje kapsamında Marmara Denizi'nde Uranüs ve Odin Finder araştırma gemileri ile toplanmış sismik ve batimetrik veriler değerlendirilmekte ve alınan karotlarda eski deprem izleri tanımlanarak yaşlandırması yapılmakta. Halen toplam 6 genç öğrenciye yüksek lisans ve doktora bursu sağlandı. Bu genç araştırmacılar EMCOL Araştırma Merkezi'nin olanaklarını kullanarak Avrasya Yerbilimleri Enstitüsü'nde lisanüstü tezlerini hazırlıyor. Merkezin olanakları ülkemizin ve Avrupa'nın tüm araştırmacılarına proje bazında çalışmalarda kullanılmak üzere açık. www.emcol.itu.edu.tr; cagatay@itu.edu.tr

Fig. 33. Article entitled "A new research centre in ITÜ: EMCOL" introducing EMCOL to the science community and general public was published in "Cumhuriyet Bilim ve Teknoloji", No. 1091, pp.10-11., published on 15 February 2008.

kitap

MARMARA DENİZİ ATLASI

Celal Şengör

İTÜ Maden Fakültesi,Jeoloji Bölümü, Genel Jeoloji Anabilim Dalı Başkanı Prof. Dr. **Namık Çağatay**'ın proje liderliğinde yürütülen 103Y053 kodlu TÜBİTAK projesinin nihai ürünü olan bu muhteşem atlas, ülkemizde son zamanlarda yapılan en önemli yerbilimi yayınlarındandır. Marmara Denizi'nin güncel çökelleri içerisindeki metal, organik ve inorganik karbon ile tane boyu dağılımını gösteren detaylı haritalardan ve onları açıklayan metinlerden oluşan bu kitap, Marmara Denizi ile

ilgisi olan herkesin elinin altında bulunması gereken bir referans eseridir.

Kitap dört ana bölümden oluşuyor:

1. Giriş: Çalışma ve Marmara Denizi tanıtılmakta, bugüne kadar bu konuda yapılan çalışmalar özetlenmekte.

2. Örnekleme ve Analiz Yöntemleri: Bu bölümde sonuçların sağlıklı bir şekilde değerlendirilebilmesi için verinin toplanması esnasında kullanılan yöntemlerle haritalama yöntemlerinin tabiatı açıklanıyor.

3. Çökel Kimyası Verileri ve Yorumu: Bu bölüm kitabın verilerinin sunulduğu ana bölümüdür. Burada 42 harita marifetiyle toplanmış olan verilerden elde edilen sonuçlar sergilenmekte. Haritaların 31 tanesi organik karbon da dahil olmak üzere asal elemanların (kasiyum, magnezyum, potasyum ve sodyum), tâli elemanların (titanyum, fosfor, kükürt), redoksa duyarlı elemanların (demir, manganez, molibden, uranyum ve yitriyum), ağır metallerin (kurşun, çinko, bakır, kadmiyum, nikel, kobalt, krom, kalay ve wolfram), yarı metallerin (arsenik ve antimon) ve diğer taş yapıcı (litojenik) eser elemanların (lantanum, yitriyum, neobiyum, toryum, lityum, rubidiyum ve baryum) Marmara Denizi yüzey çökellerindeki dağılımını göstermektedir.

4. Sonuçlar ve öneriler. Yazarlar eserlerinin Marmara Denizi'nin bentik (yani dipte oturan ve yaşayan) ekosisteminin araştırılmasında, kirlilik kaynaklarının belirlenmesinde, balıkçılık ve su ürünleri açısından metal ve organik kirliliğin tespitinde, turizmi de içeren dinlenme ve tatil ve mühendislik hizmetlerinde (liman yapımı, boru ve kablo döşeme) geniş kullanım alanları bulacağını söylemektedirler. Atlasın hedef kullanıcıları arasında belediyeler, Tarım ve Köyişleri Bakanlığı, Çevre ve Orman bakanlığı ve Özel İdareler bulunmaktadır. Atlas'ta yer alan haritalar Hükümetlerarası Oseanografi Komisyonu (UNESCO-IOC) teşvikiyleAkdeniz, Karadeniz, ve Ege denizi'nde yapılmış olan benzer haritaları tamamlayıcı niteliktedir.

Elde edilen sonuçlar Marmara Denizi'nin başta İzmit Körfezi olarak, İstanbul büyükşehir kıt'a sahanlığı (şelf) alanı ile güney kıt'a sahanlığının Bandırma, Gemlik ve Erdek Körfezi gibi alanlarının evsel ve endüstriyel atık kirliliğine maruz kaldığını göstermiştir. Buna mukabil Kuzeybatı kıt'a sahanlığı (Tekirdağ ilinin en batı sahilleri) ile Çanakkale Boğazı daha az kirlenmiştir. Bu Atlas aynı zamanda Prof. Çağatay tarafından İTÜ içerisinde AB 6. Çerçeve Programı proje desteği ile kurulan Doğu Akdeniz Deniz ve Göl Araştırmaları Merkezi'nin (Eastern Mediterranean Centre for Oceanography and Limnology, EMCOL) ilk büyük ürünlerinden biridir. Bu merkezin gelecek yıllarda denizlerimizin doğasını anlamamızda çok önemli katkılar yapacağı muhakkaktır.

Bu Atlas'ın ürünü olduğu proje ise şimdiki TÜBİTAK yönetimi tarafından desteklenmemiştir. Prof. Çağatay bunu bilhassa belirtmemi rica ederek, şimdiki TÜBİTAK yönetiminin ilgili grubunun bu tür çalışmalarına destek vermediğini söyledi.

Künye: Çağatay, N., Balkıs, N., Sancar, Ü., Çakır, Z., Yücesoy-Eryılmaz, F., Eryılmaz, M., Sarı, E., Erol, L., Akçer, S., Biltekin, D., tarihsiz [2006], MARMARA DENİZİ ÇÖKEL JEOKİMYASI ATLASI. TÜBİTAK, Çevre, Atmosfer, Yer ve Deniz Bilimleri Araştırma Grubu, Ankara, vi+81 (A3) ss+ 1 CD-ROM

Mülteci Bir Akademisyenin Biyografisi, Clemens Emin Bosch (1899-1955)

Yayıncı Kuruluş: AKMED, Tel: 0242 2434274- faks 0242 2438013

Nazi Almanyası'ndan Türkiye'ye Sığınan bir bilim insanının öyküsü

Musa Seyirci

Atatürk'ün öncülüğünde 1933'te gerçekleştirilen üniversite reformu nedeniyle Batı'dan bilim adamları Türkiye'ye davet edilmişti. Tam da bu tarihlerde Almanya, Hitler'in ırkçı politikasıyla yüze gelmişti. Naziler Nisan 1933'te yürürlüğe koydukları kamu memuriyetini yeniden düzenleyen yasaya dayanarak eşi veya kendi Yahudi olan bilim insanları üniversitelerden kovuldu. 1935 yılında çıkardıkları ırkçı kanunlarla da Yahudilerin tüm siyasi haklarını ellerinden aldı. Naziler bununla da yetinmeyerek bu bilim insanlarının üzerinde baskı ve şiddeti artırıyor ve pasaportlarını kırmızı "J" harfi ile damgalıyordu. Amaçları bu insanların bir an önce ülkeyi terk etmelerini sağlamaktı.

Bir anda yersiz yurtsuz kalan çok sayıda bilim insanı Atatürk'ün çağrısına uyarak genç Türkiye Cumhuriyeti'ne sığındı. Bunlar arasında sonradan ülkesine dönerek Frankfurt Üniversitesi'ne iki kez rektör seçilen ünlü maliyeci Prof. Fritz Neumark, Berlin'in ünlü Belediye Başkanı Prof. Ernst Reuter, çağdaş mimarlığın kurucusu Prof. Bruno Taut gibi seçkin bilginler vardır. Bu ünlüler listesine Mussolini'nin hışmından kaçan Ord. Prof. Umberto Ricci'yi, Avusturya kökenli Prof. Josef Dobretsberger'i de ekleyebiliriz.

Ancak, Clemens Emin Bosch, üniversite reformu nedeniyle yapılan çağrı üzerine Türkiye'ye gelen bilim adamlarından değildir. Türkiye'ye geliş öyküsünü, İstanbul Üniversitesi'nde kendi başvurusuyla görev alışını ileride yazacağız. Önce Prof. C. Emin Bosch'u tanıyalım:

6 Ekim 1899'da Köln'de doğar. Annesi Hollandalı bir tüccarın kızıdır. Üç yaşındayken kaybettiği babası ise Alman'dır ve küçük bir memurdur. Clemens, yirmili yaşlarını Berlin ve Heidelberg'te Eskiçağ tarihi öğrenir ve bu alanda doktorasını yapar. Üniversitede okurken tanıştığı Johanna ile evlenir. 1925-1926 yıllarında Berlin ve Halle'de Anadolu'nun Eskiçağ tarihi üzerine çalışmalar yapar. Sonra, Roma imparatorluğu döneminde Küçük Asya'da darbedilen sikkeler ve bunların Küçük Asya tarihi üzerindeki rolü konusunda çalışır. Johanna'nın Yahudi kökenli olması nedeniyle Nazilerin baskısı aile üzerinde artar. Clemens birçok ülkenin bilim kurumlarına ve üniversitelerine davet edilmeleri için mektup yazar. Mektuplarına yanıt bir tek Türkiye'den gelir. 1935 yılında İstanbul Arkeoloji Müzeleri Müdürlüğü Bosch'a bir yıl süreyle çalışma önerir. Bu öneriyi sevinçle kabul eden Bosch, 1 Kasım 1935 tarihinde müzenin sikke bölümünde göreve başlar.

Bosch, sikkelerin tasnifini ve temizliğini yaparken diğer yandan da bu sikkeleri bilim dünyasına tanıtmak için teşhir rehberini hazırlar. Sikkelerle ilgili iki katalog yayımlar. Ayrıca bugün ziyaretçilere kapalı olan Sikke Teşhir Salonu da Bosch'un eseridir. Bosch'dan memnun olan müze müdürlüğü görevini her yıl uzatır.

Bosch Müze'deki görevinden ayrıla-

CBT 1078 / 2 | 16 Kasım 2007

Fig. 34. Article entitled "Sediment Geochemical Atlas of the Sea of Marmara" by Celal Şengör introducing the book with the same title, which is a product of a EMCOL performed project. Published in "Cumhuriyet Bilim ve Teknoloji" No. 1078/2, 16 Nov. 2007,

Depremin ayak seslerini duyacağız

Tarihte ilk kez üç Türk bilim adamı bir cep denizaltısı ile Marmara Denizi'nin binlerce metre derinliğine inip fayı yakından inceleyecek. Prof. Dr. Naci Görür "Yüzme bilmiyorum ama bilim uğruna denizin derinlerine dalacağım" dedi...

Prof. Dr. Çağatay, Prof. Dr. Görür ve Prof. Dr. Şengör.

FOTOĞRAFLAR: Mert İNAN

MARMARA'daki fayları 'yakından' inceleyecek olan Fransa ve AB'nin desteklediği 2 milyon euro bütçeli cep denizaltısı projesi hayata geçiriliyor. Prof. Dr. Naci Görür, Prof. Dr. Celal Şengör ve Prof. Dr. Namık Çağatay, denizaltı ile fayın kalbine bir yolculuk yapacak. İTÜ, EMCOL (Doğu Akdeniz Oşinografi ve Limnoloji Merkezi), MTA ile Fransız bilim adamlarının yapacağı 3 aylık çalışma hakkında bilgi veren Prof. Dr. Naci Görür "Yer kabuğundan çıkan su ve gazlardan örnekler alıp inceleyeceğiz. Fay hareketleri ile su ve gazdaki değişimleri araştıracağız. Böylece olası bir deprem öncesinde bize ipuçları sağlayacak ve bir yerde depremin ayak seslerini duyabileceğiz. Bu şekilde yetkilileri uyarıp, gerekli önlemlerin alınması için alarma geçmelerini sağlayabileceğiz" dedi.

Araştırmada, Prof. Dr. Naci Görür, projenin Türk tarafının Genel koordinatörlüğünü yürütecek. Prof. Dr. Celal Şengör ve Prof. Dr. Namık Çağatay ise Türk ekibinin kaptanlığını yapacak. Geminin üstünde bulunan Nautile adlı denizaltı ile 29 Mayıs, 1 ve 3 Haziran'da 3 ayrı dalış gerçekleştirilecek. 3 kişilik denizaltıda pilot ve bir bilimadamı olacak. 5-6 bin metreye dalabilen Nautile, denizin altında 6 saat kalabiliyor. Bu dalışlar sayesinde dünyada ilk kez 3 Türk bilimadamı Marmara'nın derinliklerine bir yolculuk gerçekleştirmiş olacak. Heyecanlı olduklarını gözlenen bilimadamlarımız arasında Prof. Dr. Naci Görür çok farklı duygular içindeydi. "Yüzme bilmiyorum ama bilim uğruna binlerce metreye dalacağım için korkmuyorum, neler göreceğimizi merak ediyorum" diye konuştu. ■ TÜLAY ŞUBATLI

Belediye yüzüstü bıraktı

Depremle ilgili araştırmalarda Türk hükümetlerinden hiçbir destek görmediklerini belirten Prof. Dr. Naci Görür ve Prof. Dr. Celal Şengör "Destek görmek bir yana çalışmalarının kösteklendiğini" söylediler. "Ankara'ya görüşmek için gittiğimizde Ecevit'ten randevu bile alamadık. Şimdiki AKP hükümeti ile ise ilişkiler sıfır" dedi. Prof. Dr. Naci Görür de Marmara fayındaki su ve gaz çıkışını ölçebilmek için bir gözlem istasyonu kurmak istediklerini, İstanbul Büyükşehir Belediyesi'nin 330 bin Euro vereceğini açıklamasına rağmen geçen hafta siyasi ve ideolojik nedenlere ve bir üniversitenin engellemesi ile vazgeçildiğini söyledi. Prof. Görür "AB'ye girmeye çalışan bir hükümetin bilimsel çalışmalara karşı gösterdiği bu tavrı anlamak mümkün değil. Büyükşehir Belediyesi projeyi desteklemekten vazgeçerek bizi zora soktu. AB ülkelerinin Akdeniz'deki projesine ön hazırlık yapmayı planlıyorduk.

Fig. 35. MARNAUT Cruise held during 12 May-11 June 2007 was widely covered by Turkish media: Daily "Vatan".

MARMARA FAYI'NIN KALBİNE DALIYORLAR

Marmara Denizi'ndeki fayların çıplak gözle incelenmesini sağlayacak insanlı denizaltı Nautile bugün dalıyor. Prof. Görür "Fayların kalbine ineceğiz" dedi

İSTANBUL Teknik Üniversitesi ve Maden Tetkik Arama Enstitüsü'nün Marmara Denizi'ndeki deprem araştırmalarıyla ilgili çalışmaları bugün başlıyor. Collage De France isimli araştırma kurumunun tahsis ettiği Le Atalante isimli gemiyle Türkiye'de ilk kez insanlı olarak yapılacak dalışlar sırasında Marmara Fayı'nda hem çıplak gözle incelemeler yapılabilecek hem de örnekler alınabilecek.

KENAN İSPİR

SENSÖR YÖNTEMİ

AVRUPA Birliği ve Fransız araştırma enstitülerinin desteğiyle İTÜ ve MTA tarafından 12 haziran a kadar devam edecek çalışmalarda fayların yanı sıra çökme ve tsunami olasılığı bulunan bölgelerdeki değerler bilim adamları tarafından çıplak gözle incelenecek. Daha sonraki süreçte ise kontrolleri için sensör adı verilen aletler yerleştirilecek.

KARAKÖY Limanı'nda demirleyen Le Atalante isimli gemide bulunan Nautile insanlı denizaltını tanıtmak için dün bir basın toplantısı düzenlendi. Toplantıda çalışmalarla ilgili bilgiler veren İTÜ Maden Fakültesi Jeoloji Bölümü Öğretim Üyesi, aynı zamanda araştırmanın genel koordinatörü Prof. Dr. Naci Görür şunları söyledi:

BİN 200 METREYE...

"MARMARA Bölgesi'ni tehdit eden fay hatlarındaki çalışmalarımız başlıyor. Nautile adlı insanla dalınabilen deniz aracıyla yaklaşık bin 200 metre derinliğe dalınacak. Yani bu çalışmalarla fayların kalbine ineceğiz. Buna göre hem ilk kez fayları yerinde çıplak gözle inceleyebileceğiz hem de yerleştirilecek sensörlerle takipleri sağlanacak."

Fig. 36. MARNAUT Cruise held during 12 May-11 June 2007 was widely covered by Turkish media: Daily "Milliyet".

2.1. Publishable summary

EMCOL (*Eastern Mediterranean Centre for Oceanography and Limnology*), supported by a 3-year FP6-INCO-2005 project (Contract No. 017490), has the following main objectives:

1. To establish state-of-the-art laboratory and field infrastructure that will be used extensively in marine and lake studies related to *natural hazards and environmental changes*,

2. To develop highly qualified first- and second-generation researchers in interdisciplinary marine and lake studies at ITU, covering a wide range the fields such as underwater earthquake geology, tsunamis, submarine land slides, floods, climate change and environmental pollution,

3. To enhance interactions in projects and idea exchanges between ITU researchers and those in the EU countries.

EMCOL has established the following laboratories and field facilities for marine and lake studies:

1. Core Analyses Laboratory housing: (i) ITRAX Core scanner for sub-mm-scale resolution XRF analyses, digital X-ray radiography and colour scanning of cores, (ii) Multi Sensor Core Logger (MSCL) with gamma-ray, magnetic susceptibility, p-wave, electrical resistivity and sensors.

2. Sedimentology Laboratory, with laser-diffraction particle-size analyzer and mechanical sifter, centrifuge, freeze dryer, ultrasonic bath, smear slide preparation and optical microscopy.

3. Geochemistry Laboratory with TOC/TIC analyzer, spectrophotometer and fossil separation for isotope analyses.

4. Wet Core laboratory for sample description, digital photography, geomechanical tests, discrete sampling, and wet-sieving for microfossils.

5. Cold Core Storage Room for storing and archiving sediment cores at 4ºC.

6. Field Equipment Storage facility with sub-bottom profiler, 4x5 m platform with Uwitec tripod for lake coring and sediment sampling, 6-m boat with engine and trailer, underwater vibrocorer, kajak and piston and hammer corers, and equipment for shoreline drilling.

EMCOL serves the needs of researchers working in the Eastern Mediterranean regions in the areas of *natural hazards and environmental change*, involving imaging of sea and lake sediments and analyzing important proxies in sediment cores. With the EMCOL facilities it is possible to map active faults and submarine landslides, determine high resolution records of past earthquakes and tsunamis that are essential for earthquake and tsunami risk assessment. EMCOL field and laboratory facilities are available to marine and lake research groups and for petroleum and civil engineering projects. There are also training courses and employment opportunities for young scientists in EMCOL.

With its state-of the-art-infrastructure EMCOL has been very successful in project and networking activities during the third year. EMCOL is presently a partner in two EC FP projects (ESONET NoE and EMSO Infrastructure), and subcontractor in two EC FP projects (Anatolian Seismic Cycles and TRANSFER). EMCOL is also involved in five on-going international collaborative projects, one national-funded project, and eight student thesis projects funded by the university. EMCOL is also partner of the ESONET Marmara-Demostration Mission project to be carried in the Sea of Marmara during the next 30 months. EMCOL recently submitted four EC FP7 project proposals, in two of which it is the coordinating institution.

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Project no. SSA-INCO-CT-2005-017490

Project acronym
EMCOL

Project Title
EASTERN MEDITERRANEAN CENTRE FOR OCEANOGRAPHY AND LIMNOLOGY

FP6-ACC-SSA-2

"Integrating and Strengthening the European Research Area"
Promotion of Co-operation with Associated Candidate Countries:
Reinforcement of the Associated Candidate Countries' Research Capacities

Section 3: Final Management Report

Period covered: from 1 May 2005 to 30 April 2008 Date of preparation: 15 May 2008

Start date of project: 1 May 2005 Duration: 36 Months

Project coordinator name: Prof. Dr. Namık Çağatay
Project coordinator organisation name: Istanbul Technical University (ITU)

May 2008

Section 3.1 –Work package progress of the management activities

Management activities in the EMCOL project are carried out under two work packages (WP): WP1 "Management of Resources" and WP2 "Review, Assessment and Reporting". The progress made in these work packages during the three-year period of the project is reported below.

WP1: Management of Resources

Objectives

To mobilize the existing human and laboratory space and equipment resources.
To arrange for visiting expert training events.
To oversee financial, ethical and gender issues.

Description of work

This WP includes mobilization of existing human resources (assignment of graduate students on part time basis, secretarial services, an electrician and a mechanic), and making the arrangements for expert training visits to EMCOL. Most activities related this WP were completed during the first year the project according to the project plans.

Summary of accomplishments

Mobilization of Existing personnel:

Technicians: an electrician (Hurşit Bolat) and a geophysics specialist (Veli Geçgel) have been assigned to the project through the University's Mining Faculty during the first half of the first period. The electrician has established upgraded electrical connections in the laboratories, including an isolated grounding line essential for the ITRAX core scanner. The geophysics specialist assisted with processing and storage of X-ray core scanner and core-logger data, when help was needed. In most cases however the data storage and processing were made by the graduate students during the full project period.

Graduate research assistants provided for EMCOL's use on part-time basis: Three doctoral students (Kadir Eriş, Ummuhan Sancar and Gökhan Şans) were assigned to the project on a part time basis by the ITU-Faculty of Mines starting month 1 of the project. They were joined by a fourth part time student (Sena Akçer) during 13th month of the project . In addition 2 full-time research students (Demet Biltekin and Gül Sürmelihindi both registered in the ITU's graduate programme) were employed starting 1 March 2006, using scholarships assigned to the project by the TÜBİTAK. The 6 students, together with EMCOL's full-time students, helped the EMCOL infrastructure development and day-to-day operation of field and laboratory equipment.

Secretary: Medine Çal, secretary of General Geology Section, was also EMCOL's part-time secretary during the entire project duration.

EMCOL's Web-page.

EMCOL's web-page (www.mines.itu.edu.tr/emcol) was set up starting with month 1 of the project. It was completely revised on 15th March 2006, with a new web-address, www.emcol.itu.edu.tr. EMCOL web-site was attacked by hackers beginning October 2007. New EMCOL web site with the same address (www.emcol.itu.edu.tr) was constructed

immediately with updates using hacker-proof software provided by the university. The web-site has been continuously updated every month since its first set up to announce EMCOL's project, management and training activities during the third year of the project. The minutes of the monthly Management Committee meetings, Advisory Committee meeting and User Committee meeting were regularly placed on the web-site.

Selected experts under this WP visited EMCOL for Training acitivites (underWP 4).

Experts from different leading EU institutions were selected during the first year of the project according to the original project plans. Their invitation to deliver short training courses started only after establishment of the EMCOL lab and field infrastructure. The initially selected experts included Drs. Helge Arz and Gerald Haug (GeoForschungs Zentrum), Dr. Jens Grützner (Bremen IODP Core Repository , Dr. Luca Gasperini of CNR-ISMAR, Bologna , Dr. Sebastian Krastel of Bremen University, and Dr. Hüsne Altıok (Institute of Marine Science and Management, İstanbul University).

As discussed in detail under WP4a, during the second year of the project, three experts, Dr. Ian Boomer, Dr. Hüsne Altıok, and Jens Gruetzner, visited EMCOL and delivered courses on "Ostracods", "the use and applications of our CTD probe" and "Core Logging Methods in Marine Geology", respectively. During the third year of the project four experts, Dr. Luca Gasperini, Prof. Laurent Labeyrie, Dr. Helge Arz and Dr. Sebastian Krastel, were invited to visit EMCOL and deliver training short-courses. The first two accepted the invitation and presented training workshops and courses in EMCOL on "SEISPRO (Seismic Processing software) and CHIRCORE (Chirp-core Correlation software) in EMCOL (by Luca Gasperini of CNR-ISMAR, Bologna) and on "Geochemical tools/proxies in paleoceanography and paleoclimatology" and "Applications on the "Analyseries" computer software" (by Prof. Laurent Labeyrie (CNRS, Giff-sur-Yvette).

Organization of Laboratory Space and Existing Laboratory Equipment.

All the laboratory spaces assigned to EMCOL were restructured and upgraded for the installation and housing of new equipment during the first year of the project.
The following modifications and improvements were made during the three year period of the project:
1. Upgrades to the electrical wiring and plumbing systems, floor covering and benches were completed in the Core Analyses, Geochemistry and Sedimentology laboratories during the first year. This includes installation of a water filtration and de-ionizing system in the Sedimentology & Geochemistry laboratories. The electrical circuits in all of EMCOL's rooms are now safeguarded with UPS. The UPS in the Core Analyses lab was further upgraded to 30KVA during the third year. The Field Equipment Storage Facility is temporarily located in a secure room near EMCOL's student office. Another room was assigned to EMCOL during the third year for storing large field equipment..
2. A core–photography set-up was manufactured during the second year and was further improved during the third year.
3. The Core Storage Room was fitted with a new, heavy-duty shelving system and improved electrical wiring. EMCOL's sediment cores were placed in a systematic order in the room. This room was later fitted with temperature and humidity sensor and alarm system.
4. Field and laboratory equipment were reorganized in the Field Equipment Storage Room and in the laboratories during the first year. These included platform, corers, sediment traps, fume hood, mechanical shaker with sieves, and oven.
5. In all EMCOL laboratories internet connection was established during the first year.
6. An office (4x7 m) for EMCOL's full-time research students were assigned in the Faculty of Mines building during the first year. This room was fully renovated and fitted with office

furnature, equipment and computers with internet connection.

7. EMCOL was assigned two new spaces in the ITU Faculty of Mines building furing the third year: (a) an EMCOL meeting room, completely refurbished and used for EMCOL meetings, short-courses and seminars, and (2) a new lab space for a future isotope geochemistry laboratory,

User Committee meetings

The first and second meetings of the **User Committee,** consisting of all internal (ITU) and external users of EMCOL facilities, were held jointly with MC meetings in April 2007 and 2008. The main points of discussion made by the EMCOL users were included in the same minutes of the MC meeting. These minutes are published on the EMCOL web-page and included under Deliverables D14.

Status of Deliverables

D3. The project's web site was continuously updated with information on EMCOL's progress and ongoing research work during the entire project period. This is overseen by the management committee and improvements to the design are ongoing. Task leaders were able to log on and update information on their respective tasks.

D5. Training sessions on the uses and applications of major laboratory equipment (ITRAX XRF core scanner; MSCL, TOC/TIC, subbottom-seismic, seafloor observatories)

D14. Publication of the first and second *User Committee* meeting minutes was made on the EMCOL web-site.

Milestones and results

The following milestones of this WP were achieved by the end of the project:

1. The project's human resources were in place, including young researchers, assistants, committee members and technicians, carrying out research (by the end first year).
2. The pre-existing equipment for EMCOL facilities were set up in their respective laboratories, repaired or upgraded as required, and are functioning to their full capacity. The laboratories are ready for installation and operation of new equipment (end of first year).
3. Ten young scientists were trained by short training given by invited scientists and through extensive project work.

WP2: Review, Assessment and Reporting

Objectives: Regular review and assessment of the project's progress.

Description of work

The compositions of the **Management Committee** and the **Advisory Committee** for EMCOL were finalized during the first management committee meeting of the project.

EMCOL's Management Committee: This committee consisted of EMCOL's Task Leaders and were officially appointed by the Rector and the University Senate as follows:

Coordinator: Namık Çağatay
Sedimentology: Lisa Doner
Geochemistry: Remzi Akkök
Core Analyses: Can Genç and Nilgün Okay
Core Repository: Nilgün Okay
Field Equipment: Mahir Vardar

There was only one change in the EMCOL's **Management Committee** (EMC) during the project period: this being the replacement of Dr. Lisa Doner by Dr. Ercan Özcan as the task leader of the Sedimentology Laboratory starting 16th project month. This change took place because the Dr. Lisa Doner's departure from ITU for USA.

EMCOL's Advisory Committee : Four individuals nominated by the management committee in the first management committee meeting served as external advisors to EMCOL during the first year:

5. Prof. Dr. Temel Oğuz (Marine Sciences Institute, METU, Erdemli, İçel)
6. Dr. Frank Niessen (Alfred Wegener Institute, Bremerhaven, Germany)
7. Nazım Çubukçu, SHOD , Çubuklu, Istanbul
8. Kerim Sarıkavak (MTA, Marine Research Unit)

The SHOD representative on the committee was changed during the second and third year of the project. Admiral Nazım Çubukçu of SHOD (Department of Navigation, Hydrography and Oceanography) retired from service on 30 August 2006, and was replaced for the second year by Dr. Erhan Gezgin of SHOD, a physical oceanographer, who himself was replaced for the third by Mustafa Özyalvaç, another physical oceanographer. The decision for these replacements was made by the SHOD.

The **Management Committee** met monthly to review EMCOL's progress towards its deliverables and objectives. All task leaders, research assistants and potential users of EMCOL are invited to participate in these monthly management meetings. The meeting minutes are compiled within less than a week of the meetings, distributed by e-mail to all of the EMCOL members, and then placed on the EMCOL's web-site. The minutes were made available for examination by the Advisory Committee.

The **Advisory Committee** met three times at the end of each year (period) during 19-20 April 2006, 12-13 April 2007 and 21-22 April 2008 to carry out annual reviews of EMCOL and to assess overall progress towards the project objectives. Their reviews included consultations with the graduate students at EMCOL and other user groups within ITU. Their reports are appended under deliverables D1 and placed on the EMCOL's web-site.

EMCOL presented in the Open House and Orientation week of Faculty of Mines with a poster and a power-point slide show on the Faculty of Mines Career Days during 1-3 March, 2006. Many students and some petroleum companies visited the EMCOL stand and recieved first-hand information about EMCOL.

EMCOL introductory meeting was held in EMCOL on 10 April 2007 during which EMCOL facilities were introduced to high level ITU administration, including the Rector of The University Prof. Faruk Karadoğan, Deans, Directors of Research Institutes, Director and oceanographers from SHOD, and scientists from MTA, France and Israel who happened to be in Istanbul for the CIESM Congress. This meeting involved an introductory power point presentation of the EMCOL facilities and research projects, followed by a visit to the EMCOL facilities.

The open house in the Faculty of Mines was not held during the third project year, but the EMCOL poster was displayed in the same area in the Faculty of Mines building during the TURQUA (Turkish Quaternary) Symposium during 16-18 May 2007. In addition, EMCOL's brochures and posters in Turkish and English were updated, displayed and distributed in various meetings, including ESONET All Regions Workshop, TURQUA, ECOSYSTEMS, and 61. Turkish Geological Congress. EMCOL scientists participated in 25 scientific meetings and presented 45 papers. They also published 4 peer-reviewed articles in international journals, 3 papers in monographs and 2 articles on EMCOL and EMCOL related research in a popular

science and technology magazine, Cumhuriyet Bilim Teknoloji (see full list under deliverable 16). The EMCOL scientists held interviews during the third project year with an international TV channel (ZDF and History channels), one national TV Channel (Technology TV Channel) and a popular Science magazine "GEO".

The EMCOL posters introducing EMCOL and EMCOL's research are displayed on boards outside the EMCOL labs. The EMCOL brochures in Turkish and English were distributed to EMCOL visitors.

Deliverables

D1. Monthly management meeting minutes have been prepared and distributed within EMCOL regularly, and have all been posted recently on the EMCOL web site (www.emcol.itu.edu.tr), together with EMCOL's Advisory Committee's report.

D3. EMCOL's web-page was updated regularly every month, reporting EMCOL's progress, project activities and availability of employment opportunities.

D9. In the monthly meetings with the coordinator, task leaders verbally reported progress on the laboratory developments, equipment purchase and maintenance, and discussed any problems with implementation. They also submitted bi-annual written reports to the coordinator (see deliverable no. 9).

D11. EMCOL poster was displayed in the Faculty of Mines building during Open House and the TURQUA (Turkish Quaternary) Symposium, and EMCOL introductory meeting for high level officials and guests.

D17. The three yearly periodic progress activity reports and one final activity report to the Commission by the project coordinator.

Milestones and result

The milestones of this WP are the monthly reports of the Management Committee, and the annual reports of the Advisory Committee, and the lab reports of the task leaders to the coordinator. The results of the review by the Advisory Committee have been commendable regarding the EMCOL's development.

Section 3.2 - Justification of major cost items and resources

Justification of major equipment

The premise behind EMCOL's budget requests is that, in the EU, as well as elsewhere in the world, marine and lake researchers have access to several state-of-the-art facilities which can be used to complete a wide array of research projects. Preparation of the EMCOL's laboratory space in ITU's Faculty of Mines building and purchase of state-of-the-art equipment for the EMCOL laboratories and facilities are the most important part of the EMCOL project carried out under WP1 and WP3 during the first period. The ITRAX XRF core scanner purchased during the first period and the GEOTEK MSCL (Multi Sensor Core Logger) purchased during the second period constitutes nearly half of the project budget. The ITRAX data are very high-resolution (sub-mm scale) measurements of chemical elemental composition and X-ray imaging in a continuous sequence along the scanned sediment cores. The instrument is truly a state-of-the-art instrument, with at least 3 of the Europe's marine research laboratories having an ITRAX XRF Core Scanner, and more on order. Recently, Woods Hole Oceanographic Institution and University of Minnesota in USA and Kochi University in Japan and acquired one also. The MSCL has become a standard tool in

advanced marine and research labs and research vessels. The ITRAX Core Scanner and MSCL together constitutes a state-of-the-art Core Analysis Laboratory for EMCOL. This lab has been extensively used in the third year in EMCOL's EC FP, international collaborative and graduate student thesis research projects.

The utility and relevance of the new major equipment purchased for natural hazard and environmental change studies are listed below:

1). XRF core scanner with digital X-ray radiography and colour scanner (already purchased, installed and operational) is used in high resolution analysis of cores for climate and environmental changes and for identification of the records of earthquake related mass flows, turbidites and homogenites in sediment cores. Multi-parameter measurements by the core scanner (together with the core-logger to be purchased) will in turn help determine the frequency of occurrence of earthquakes which can than be used in modelling and prediction of future earthquakes. The extremely high resolution (sub-millimetre scale) scans of the core scanner are especially essential for detecting past climate changes at a decadal and centennial scales, as well as past sea level changes. It has been used extensively for many projects in EMCOL, such as "Earthquake risk assessment", "TRANSFER", "Seismic Cycles", "MARNAUT" and graduate student thesis projects.

2) Geotek MSCL with Gamma density/porosity, magnetic susceptibility, p-wave velocity and electrical resistivity sensors, is now a standard equipment for physical property analysis of cores. It is used by all Marine Geology Institutions and Programmes such as MARUM (Bremen University), WHOI, IODP (Integrated Ocean Drilling Programme), ICDP (International Continental Drilling Programme). It is an indispensable equipment for studying records of climate and other environmental changes in cores. . It has been used for many projects in EMCOL, such as "Earthquake risk assessment", "TRANSFER", "Seismic Cycles", "MARNAUT" and graduate student thesis projects.

The MSCL originally planned to be purchased did not include a Gamma density/porosity sensor. However, based on recommendation of the advisory committee in their report of 20 April 2006 and on EMCOL's experience with the project work we purchased also the gamma density/porosity sensor getting approval from the EC project officers. The cost of the gamma porosity/density (18,945 Euro) was met from money that was saved from WP4a: Employment of doctoral students. We had only partly used the amount budgeted for the WP4a activity by the end of the first period, firstly because we could not find suitable candidates for these positions, and secondly TUBITAK provided scholarships for 2 graduate students to be employed for the EMCOL project starting March, 2006.

3. High resolution seismic sub-bottom profiler is essential in earthquake studies for mapping active faults, in tsunami studies for mapping areas of submarine landslide areas, and in sea level-change studies for mapping ancient shore lines. This equipment has already been used for many projects, such as "TRANSFER", "Seismic Cycles", and student thesis projects.

4. Laser particle size analyzer (purchased and installed) is used for studying sedimentological records of climate and environmental changes, sea-level changes, and earthquake- and tsunami-related mass flows, turbidites and homogenites in sediment cores. It has been used for many projects, such as "Earthquake risk assessment", "TRANSFER", "Seismic Cycles", and student thesis projects.

5. TOC/TIC (total organic/inorganic carbon) analyzer (purchased and installed) analyzer is needed for studying carbon cycle related to climate change and eutrophication in marine and lake basins.

All the above four major instruments produce multi-proxy data that can also be used in climate modeling and in modeling and prediction of feature earthquakes.

6. The submersible vibracorer is an important tool for collection of long continuous cores of lakes and shallow marine areas, needed for natural hazards and environmental change studies. It is especially suitable for sedimentary environments with compacted or thick clay layers, thick sand and tephra layers. It was used last summer for the TRANSFER project.

7. Boat with 25 HP engine and a trailer is needed for lake and near shore marine studies, especially using the subbottom profiler and for taking short cores. It has already been used in many lake projects in Lake Hazar, K.Çekmece Lagoon, Yeniçağa Lake, and others on the North Anatolian fault for the EC FP "Seismic Cycles" and "TRANSFER" projects..

All the above major instruments were planned to be purchased from the project budget to build the EMCOL infrastructure, and listed in Table 4 in Annex 1 of the contract. The only exceptions were spectrophotometer and Admiral Navigation software, which were small items in terms of cost, but project work necessitated their purchase. Differential GPS and Admiral Navigation software are essential for field surveys in sea and lakes for designing and locating seismic lines and sampling locations and Spectrophotometer is needed for biogenic silica analysis and analysis of pore waters for sulphate, silica, phosphate and ammonia analysis using colorimetric methods.

Justification of travel costs

Travel expenses incurred as result of off-site training of lab teams (WP4a) and Brokerage events (WP5) during the project duration. These activities contributed to training of young scientists in the area of natural hazards and environmental changes in marine and lake basins and networking and recognition of EMCOL in EU. All the WP4a and WP5 activities were executed according to the budget plan indicated in Table 4 of Annex -1 of the contract. Details of these activities and their justification are explained below:

First period

Two-travel expenses incurred according to the original plan in the project during the first period: the first one under WP4a: Training of Lab teams and the second under WP5: Brokerage events (see in Table 4 in Annex I of the contract):

1. Training visits by task leaders and EMCOL research assistants are an integral part of WP4 in the EMCOL project. Training visits were made by coordinator Namık Çağatay and task leaders Can Genç, Lisa Doner and Nilgün Okay, and research students Ümmühan Sancar and Emre Damcı to:

a) GeoForschungsZentrum (GFZ), Potsdam, Germany (12-15 March, 2006)

b) IODP core repository, Bremen University, Germany (15-17 March, 2006)

This trip involved laboratory demonstrations on the XRF core scanner, core logger and sample preparation techniques in the above institutions. Discussion with the laboratory managers in these institutions concerning the day- to-day running of the equipment and laboratories were important for the coordinator and the task leaders.

2. A trip was made by Namık Çağatay (EMCOL coordinator) to attend the EGU (European Geosciences Union) meeting held in Vienna during 2-7 April 2006. The coordinator presented a poster paper on EMCOL and distributed the EMCOL brochures. This meeting was attended by about 6,000 scientists. This activity was an important part of the "EMCOL's brokerage events" under WP5.

Second period:

During the second reporting period travel expenses incurred according to the original plans in the project under WP4a: Training of laboratory teams and WP5 Brokerage events. These

activities are an integral part of the EMCOL project as listed in Table 4 and 5 in Annex I of the contract.

1. Training visits by EMCOL research assistants Emre Damcı and Kadir Eriş to IODP core repository, Bremen University, Germany (EMCOL Research assistants, Emre Damcı and Kadir Eriş, attended a one-week hands-on-training course on MSCL (Multisensor core-logger) in IODP Bremen Core Repisotory during 18-22 September, 2006. The course was supervised by Dr. Jens Grutzner.

2. EMCOL Research assistant, Sena Akçer attended a MSCL (Multisensor core-logger) in GFZ Potsdam Germany during 31 October - 3 November, 2006. The course was organized and supervised by Dr. Helge Arz. There was a delay of one week in the original schedule for the course, because of some visa problems in the German Consulate. Gökhan Şans could not attend the course because of the clash of his another activity with the dates of the course.

Two travel events took place under Brokerage events (WP5):

1. Namık Çağatay (EMCOL coordinator) attended the *ATAG (Active Tectonics Research Group) Meeting* in Izmir, Turkey during 2-4 November, 2006 and presented some of EMCOL's research results as a paper entitled "Late Quaternary sedimentary sequence of the Marmara Sea: Archives of tectonic rates and earthquakes".

2. Deniz Dikçe (EMCOL's full-time research student) travelled to Ankara to present EMCOL project results at the *Geological Congress of Turkey* during 16-20 April 2007.

Third period:

A travel was made by the Coordinator Namık Çağatay to attend the European Geosciences Union (EGU) Congress 2008 in Vienna to present EMCOL's work on the "Sedimentary Earthquake records in the Sea of Marmara". These activity is justified under WP5 "Brokerage events". The travels of EMCOL graduate students Emre Damcı and Dursun Acar to attend the "ESONET training short course" and "Best practice workshop" in Bremen in January 2008 were made under WP4a.

Form C - Model of Financial Statement per Activity for a Specific Support Action

(to be completed by each contractor)

Type of instrument	**Specific Support Action**	**Type of Action (if necessary)**	**N.A**
Project Title (or Acronym)	EMCOL	**Contract n°**	017490

Contractors's legal name	Istanbul Teknik Universitesi		
Legal Type	GOV		
Contact Person	Prof.Dr. Namık Çağatay	**Telephone**	+90-212-285-2611
Telecopy	+90-212-285-6080	**E-mail**	cagatay@itu.edu.tr

Cost model used (AC/FC or FCF)	AC	**Indirect costs (Real or Flat Rate of 20% of Direct costs, except subcontracting)**	**Flat Rate of 20% of Direct Costs, except subcontracting (*)**
Period from	01.05.2005	**TO**	30.04.2008

(*) Except otherwise agreed in Article 9 (especial clauses) of the contract

1- Resources (Third party(ies))			
Are there any resources made available on the basis of a prior agreement with third parties identified in Annex I of the contract? (Yes / No)			NO
If Yes, please provide the following information			
Third Party 1 (Y1) Legal name		**Cost model used**	
Third Party 2 (Y2) Legal name		**Cost model used**	
Third Party 3 (Y3) Legal name		**Cost model used**	
Third Party 4 (Y4) Legal name		**Cost model used**	
If necessary add another Form C			

2- Declaration of eligible costs (in €)

Please complete only the activity covered by the relevant instrument (and type of action) indicated above and as mentioned in Article II.25 and/or in Annexes I and III of the contract.

If you are a contractor using the additional cost model (AC):

- indicate only your additional eligible costs, except for Management of the Consortium Activity for which you may indicate your full eligible costs;

do not declare eligible direct additional costs specifically covered by contributions from third parties as mentioned in Articles II.20 and II.23.a and b of the contract.

If you are a contractor using a full cost model (FC/FCF), indicate your full eligible costs
The costs declared should distinguish between direct and indirect costs
If necessary, adjustments to previous period(s) may be included where appropriate

	Type of Activity											
	Research and Technological Development / Innovation (A)		Demonstration (B)		Training (C)		Management of the Consortium (D)		Other Specific Activities (E)		Total (F) = (A)+(B)+(C)+(D)+(E)	
	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)
Direct costs									725784.38		725784.38	0.00
Of which subcontracting									2656.00		2656.00	0.00
Indirect costs									144625.00		144625.00	0.00
Adjustments to previous period(s)									0.00		0.00	0.00
Total costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	870409.38	0.00	870409.38	0.00

3- Declaration of receipts (in €)

If you are a contractor using the additional cost model (AC), indicate only receipts covered by Article II.23.c of the contract.

If you are a contractor using a full cost model (FC/FCF), indicate receipts covered by Article II.23 of the contract.

	Type of Activity											
	Research and Technological Development / Innovation (A')		Demonstration (B')		Training (C')		Management of the Consortium (D')		Other Specific Activities (E')		Total (F') = (A)'+(B')+(C')+(D')+(E')	
	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)	Contractor	Third Party(ies)
Total receipts											0.00	0.00

4- Declaration of interest generated by the pre-financing (in €)	
To be completed only by the coordinator.	
Did the pre-financing (advance) you received by the Commission for this period earn interest? (Yes / No)	NO
If yes, please indicate the amount (in €)	

5- Request of FP6 Financial Contribution (in €)	
For this period, the FP6 Community financial contribution resuested is equal to (amount in €)	870409.38

6- Audit certificates				
According to the contract, does this Financial Statement need an audit certificate (or several in case of Third party(ies)) delivered by independent auditor(s)? (Yes / No)				YES
If Yes, does this(those) audit certificate(s) cover only this Financial Statement per Activity? (Yes / No)				NO
If No, what are the periods covered by this(those) audit certificate(s) ?		From -to		01.05.2005-30.04.2008
What is the total cost of this(those) audit certificate(s) (in €) per independent auditor(s) ?				
Audit certificate of the contractor (X)				
Legal name of the audit firm	DRT BAĞIMSIZ DENETİM SERBEST MUHASEBECİ MÜŞAVİRLİK A.Ş.	**Cost of the certificate**		2656.00
Audit certificate(s) of the third party(ies) (Ys) ***(if necessary)***				
Y1 : Legal name of the audit firm		**Cost of the certificate**		
Y2 : Legal name of the audit firm		**Cost of the certificate**		
Y3 : Legal name of the audit firm		**Cost of the certificate**		
Y4 : Legal name of the audit firm		**Cost of the certificate**		
If necessary add another Form C.		**Total (Z) = (X) + (Ys)**		2656.00
Reminders: *The cost of an audit certificate is included in the costs declared under the activity "Management of the Consortium".The required audit certificate (s) is (are) attached to this Financial Statement*				

7- Conversion rates	
Costs incurred in currencies other than EURO shall be reported in EURO. Please mention the conversion rate used (only one choice is possible) – Please note that the same principle applies for receipts.	
Contractor	
- Conversion rate of the date of incurred actual costs? (YES / NO)	YES
- Conversion rate of the first day of the first month following the period covered by this Financial Statement? (YES/NO)	NO
Third Party(ies) ***(if necessary)***	
Third Party 1 (Y1)	
- Conversion rate of the date of incurred actual costs? (YES / NO)	YES
- Conversion rate of the first day of the first month following the period covered by this Financial Statement? (YES/NO)	NO
Third Party 2 (Y2)	
- Conversion rate of the date of incurred actual costs? (YES / NO)	YES
- Conversion rate of the first day of the first month following the period covered by this Financial Statement? (YES/NO)	NO
Third Party 3 (Y3)	
- Conversion rate of the date of incurred actual costs? (YES / NO)	YES

- Conversion rate of the first day of the first month following the period covered by this Financial Statement? (YES/NO)	NO
Third Party 4 (Y4)	
- Conversion rate of the date of incurred actual costs? (YES / NO)	YES
- Conversion rate of the first day of the first month following the period covered by this Financial Statement? (YES/NO)	NO

If necessary add another Form C.

8- Contractor's Certificate

We certify that:

- the costs declared above are directly related to the resources used to reach the objectives of the project ;
- the receipts declared above are directly related to the resources used to reach the objectives of the project ;
- the costs declared above fall within the definition of eligible costs specified in Articles II.19, II.20, II.21, II.22 and II.25 of the contract, and, if relevant, in Annex III and Article 9 (special clauses) of the contract ;
- the receipts declared above fall within the definition of receipts specified in Article II.23 of the contract ;
- the interest generated by the pre-financing declared above falls within the definition of Article II.27 of the contract ;

incorporated in the above Statement ;

- the above information declared is complete and true ;
- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

Contractor's Stamp	Name of the Person responsible for the work	Name of the duly authorised Financial Officer
	Prof.Dr. Namık Cağatay	Ahmet Dönmez
	Date	**Date**
	Signature	**Signature**

Table 3.1: Budget vs. Actual Costs

Cost Budget Follow-up Table

Contract No:17490	Acronym: EMCOL				Date:			Comment
WP 1: Management of Resources	Budget	ACTUAL COSTS (EUR)				Pct Spent		
		Period 1	Period 2	Period 3	TOTAL	TOTAL %	Remaining Budget	
Electrical (generator, breakers, UPS)	7600	7600			7600	100	0	
Plumbing (in-line traps, water purifiers)	5100	5100			5100	100	0	
Air (heating, cooling, dehumidifiers, filters)	6400	6784			6784	106	-384	
Technical services for upgrades	5500	5500			5500	100	0	
Bank Transfer fee		84	29	98				
Total Infrastructure Upgrades in WP1	**24600**	**25069**	**29**	**98**	**25196**	**102**	**-596**	
WP 2: Review, Assessment & Reporting								
3 advisory members/yr.	**900**			**877**				
Air Tickets 500€ (x3)	2700	306	425	502	1233	46	1467	
Per Diem (75€)	1350	583	225	375	1183	88	167	
Audit				2656				
Total Review Expenditures for 3 years	**4050**	**889**	**650**	**3533**	**5072**	**125**	**-1022**	
WP 3: Development of Infrastructure								
Core Analysis Laboratory	**382362**	**286538**	**120945**		**407483**	**107**	**-25121**	
ITRAX Core Scanner (3yr service package)	280250	286538			286538	102	-6288	
MST Corelogger	102112		120945		120945	118	-18833	
Sedimentology Laboratory	**44840**	**33000**	**11111**	**442**	**44553**	**99**	**287**	
Sediment Size Analyser	22000	22000		442	22442	102	-442	
Microbalance	4500		3805		3805	85	695	
Centrifuge : Eppindorf 5810	7340		7306		7306	100	34	
Freeze Dryer Virtis 2K Benchtop	11000	11000			11000	100	0	
Sediment Geochemistry Laboratory	**20000**	**0**	**17014**	**888**	**17902**	**90**	**2098**	
CM140 Coulometer	20000		17014	888	17902	90	2098	
Field Equipment Storage Facility	**91628**	**68598**	**27267**		**95865**	**105**	**-4237**	
SES 2000 Subbotom Profiler	44760	50000			50000	112	-5240	
CTD, DO sensor 200m cable	14538	14538			14538	100	0	
Boat & Motor & Trailer	5300		8035		8035	152	-2735	
PowerMax Differential GPS	2025	1948	832		2780	137	-755	

Underwater Vibrocorer	23045		18400		18400	80	4645
*Uwitec Tripod	1960	2112			2112	108	-152
Core Repository	**1170**	**3809**			**3809**	**326**	**-2639**
Total Equipment Costs	**540000**	**391944**	**176337**	**1330**	**569612**	**105**	**-29612**
WP 4a: Employment of Doctoral Students							
Full time doctoral student	600x 32 month	600x11	600x30	600x45			
Total Salary for 4 Doctoral Students	**76800**	**6600**	**18100**	**27000**	**51700**	**67**	25100
WP 4b: Training of Laboratory teams							
2 off-site training visits by 6-person lab teams	**12000**	**6364**	**3494**		**9857**	**82**	**2143**
Air Tickets 500€	6000	1949	1394		3342	56	2658
Per Diem (100€)	6000	4415	2100		6515	109	-515
ITRAX on-site training pkg (3 visits)	**52250**	**18000**	**17125**	**17125**	**52250**	**100**	**0**
Air Tickets 500€	1500				0	0	1500
Per Diem (100€)	1500				0	0	1500
Fees	49250	18000	17125	17125	52250	106	-3000
MSCL on-site training pkg (1 visit)	**5850**	**0**	**5850**		**5850**	**100**	**0**
Air Tickets 500€	500				0	0	500
Per Diem (100€)	525				0	0	525
Fees	4825		5850		5850	121	-1025
10 On-site Training Events by Visiting Experts	**20000**	**0**	**1130**	**1064**	**2194**	**11**	**17806**
Air Tickets 500€	5000		630	364	994	20	4006
Per Diem (100€)	5000		500	700	1200	24	3800
Fees	10000				0	0	10000
Total Training Costs	**90100**	**24364**	**27598**	**18189**	**70151**	**78**	**19949**
WP 5: Brokerage Events							
Publication fees (brochures & posters)	**4050**	**123**	**913**	**93**	**1130**	**28**	**2920**
Fees	4050	123	913	93	1130	28	2920
Total for 4 meetings	**10400**	**1250**	**337**	**1336**	**2924**	**28**	**7476**
Air Tickets 500€	4000	229	137	346	712	18	3288
Per Diem (100€)	4000	641	200	600	1441	36	2559
Fees	2400	380		390	770	32	1630
Total Brokerage Events Costs	**14450**	**1374**	**1251**	**1429**	**4054**	**28**	**10396**
Total Direct Cost Budget (DC)	**750000**	**450239**	**223966**	**51579**	**725784**	**97**	**24216**
Total Indirect Cost Budget (DC)	**150000**	**90048**	**44793**	**9785**	**144626**	**96**	**5374**

Table 3.2: Person-Months Status Table[2]

PERIOD: 1-3		TOTALS	Coord.	Partic. 1	Partic. 2	Partic. 3	etc…									AC TOTALS	AC partic. x	AC partic. y		
Workpackage 1: Title	**Actual WP total:**	**0**														**69**	69			
Management of Resources	**Planned WP total:**	**0**														**60**	60			
Workpackage 2: Title	**Actual WP total:**	**0**														**36**	30			
Review, Assessment and Reporting	**Planned WP total:**	**0**														**36**	36			
Workpackage 3: Title	**Actual WP total:**	**0**														**39**	39			
Development and Maintenance of Inf	**Planned WP total:**	**0**														**36**	36			
Workpackage 4: Title	**Actual WP total:**	**86**	86													**9**	9			
Training of laboratory teams	**Planned WP total:**	**132**	132													**9**	9			
Workpackage 5: Title	**Actual WP total:**	**0**														**6**	6			
Brokerage Events	**Planned WP total:**	**0**														**6**	6			
Workpackage 6: Title	**Actual WP total:**	**0**														**0**				
	Planned WP total:	**0**														**0**				
Workpackage 7: Title	**Actual WP total:**	**0**														**0**				
	Planned WP total:	**0**														**0**				
Workpackage 8: Title	**Actual WP total:**	**0**														**0**				
	Planned WP total:	**0**														**0**				
Workpackage 9: Title	**Actual WP total:**	**0**														**0**				
	Planned WP total:	**0**														**0**				
	Actual total:	**86**	**86**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**153**	**153**	**0**	**0**	**0**
Total Project Person-month	**Planned total:**	**132**	**132**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**147**	**147**	**0**	**0**	**0**

Section 3.3 – Summary financial report on cost items

The following account is a summary of the financial costs incurred during the first period of the project, as indicated in Table 3.1 "budget vs. actual cost".

WP1 **"**Management of resources"

1. A complete renovation of Sedimentology – Geochemistry and Core Analyses laboratory (all consisting of three rooms) was made with new flooring, electrical wiring, UPS and internet connection, lighting fixtures, a lowered ceiling, climate control system, new cabinets, counters and plumbing, including an inline sediment trap. A pressurized AquaLine water filtration system with activated carbon and reverse osmosis filters was also fitted in the Sedimentology-Geochemistry Laboratory.
2. Core Storage room were fitted with new custom-made shelves, electrial circuiting and lighting. This room was also fitted with temperature and humidity sensors and an alarm during the second year.
3. EMCOL student office was fitted with electrical circuits, lighting, internet connection, office furniture, and computers for 4 students.
4. Glass partitioning of the assigned spaces for EMCOL Meeting Room and a new laboratory in the Faculty of Mines Building were made during the third year using indirect cost (*2,551.5 Euro*).
5. Refurbishment of the EMCOL meeting room with tables, chairs and data-show projector and computer using funds from the indirect cost *(6,550 Euro)*.

Total amount of money spent for the renovation and preparation of the laboratory space (WP1) from the direct cost is 25,196 Euro. This amount is 596 Euro more than the budgeted amount (see Table 3.1: Budget vs. actual cost).

Total amount spent from the indirect cost budget is *9,101.5 Euro*,

WP2 "Review, assessment and reporting"

The major cost under this WP was the travel and per-diem expenses of two Advisory Committee members, Temel Oğuz and Frank Niessen travelling from outside Istanbul (2416 Euro), and the total auditing fee (2656 Euro, excluding VAT) paid to the auditing company.

The total expenses incurred for this WP is 5416 Euro less than the budgeted amount in the contract. This amount is 1,022 Euro more than the allocated amount, because the auditing fee was not foreseen in the original proposal and was unaccounted for in the contract.

WP3 "Development of infrastructure"

This WP involves the purchase of the laboratory and field equipment, such as ITRAX XRF Core Scanner, MSCL (multi sensor core logger), subbottom profiler (INNOMAR SES 2000 system), Rossfelder underwater vibrocorer, boat with 25 HP engine and a trailer, CSI Wireless PowerMax DGPS, Admiral navigation software, spectrophotometer and ultrasonic bath.

The only significant deviation from the original project proposal was the purchase of gamma porosity/density sensor of the MSCL, which was not included in the planned budget of the contract. This piece of sensor costed 18,945 Euro, which was paid from the money saved during the first year from the student salaries under WP4a. The decision to purchase the sensor was taken because of the strong advice from the Advisory Committee and after obtaining the consent of the project officers.

The amount spent for WP3 as eligible direct cost is 569,612 Euro.

The cost is *29,612 Euro* more than the budgeted amount in the contract. This difference was mainly due to purchase of the gamma porosity/density sensor and some other equipment such as spectrophotometer, ultrasonic bath, navigation software, that were urgently needed for the project work. A total of 33,590 Euro was also spent from the indirect cost budget for: a) covering a part of the new laboratory, meeting room and student office renovation, b) purchasing office and lab furniture, c) purchasing student and lab computers, and d) covering the customs tax, customs service, local transportation of purchased equipment to ITU.

WP4a "Employment of doctoral students"

We planned to employ 4 doctoral students starting with the project month 5. We could only find 2 suitable students on 1 September 2005. One of them left EMCOL on 2 December 2005 (project month 8) and the other continues to this date. *The amount paid as a salary to the doctoral students during the first reporting period is 6,600 Euro, which is considerably less than the amount of 19,200 Euro allocated to this activity for the first period.*

During the second year EMCOL filled all 4 full-time graduate positions by the project month 18. The amounts paid as a salary to the doctoral students during the second and third reporting periods were *18,100 Euro* and *27,000 Euro.*

The total amount paid as a salary to the doctoral students from the direct cost budget for the whole duration of the project is 51,700 Euro.

This amount is 25,100 Euro less than the budgeted amount. However, because of the inadvertently assigned low salaries in the contract and high social security taxes, a part of the tax had to be paid from the indirect cost budget, which amounted to a total sum of *11,077 Euro.*

WP4b "Training of laboratory teams"

This expenditure from this WP for the reporting period involved the following activities:

1. Three on-site training and service course given by Cox Analytical Systems on the ITRAX core scanner installed in EMCOL's Core Analyses Laboratory. *The cost of these activities spread over the three- year project period is 52,250 Euro.*
2. One on-site training by Geotek engineers during the second period12-14 February. *The cost of this activity was 5850 Euro.*
3. Four on-site training courses by visiting experts, costing *2,194 Euro.*
4. Six off-site training courses by laboratory teams, costing *9,857 Euro* from the direct budget and *1,156 Euro* from the indirect cost budget.

The total amount spent for WP4b from the direct cost budget is 70,151 Euro. This amount is 19,949 Euro less than the budgeted amount in the contract (see Table 3.1 Cost budget follow-up table).

WP5 "Brokerage events"

The costs incurred under this WP included the following

1) Printing of posters and brochures: *1,130 Euro*

2) Two travels by Coordinator (Namık Çağatay) to EGU (European Geosciences Union) (EGU) Congresses in Vienna in 2006 and 2008 to present EMCOL poster, distribute EMCOL brochures, and present the EMCOL project results. The total cost of these activities is *2,924 Euro.*

3) Presentation of EMCOL and EMCOL scientific results by EMCOL students and Coordinator in two national scientific meetings (Geological Congress of Turkey in Ankara and Active Tectonics Group meeting in Izmir) during the second period. The total cost: *337 Euro.*

4) Travel expenses by coordinator Namık Çağatay to attend the ESONET Training Workshop in Bremen to present the "Sea of Marmara as an observatory site and EMCOL's work in the Mamrara node" were paid from the indirect cost budget (*701 Euro)*.

The total amount spent for the WP5 from the direct eligible cost budget is 4,054 Euro.

The total expenditure is *10,396 Euro* less than the budgeted amount, which in no ways mean that effort on part of the brokerage activities were spared. The main reason for the relatively small expenditure for this WP was that the travels were economized and several additional travels reported under Section 3.1 as the WP5 activities were funded by the inviting organizations or paid from the indirect cost budget.

The total direct eligible costs for all the WPs for the whole project period is 725,784 Euro.

The total amount of funds spent from the indirect cost budget for the project is 55,962.5 Euro.
No overheads were paid to the ITU personnel working for the EMCOL project.

Section 3.4 – Summary explanation of the impact on any major deviations from cost budget and from person-months

As mentioned in Section 2.3 of this report, the only significant deviation from the original cost budget was the purchase of gamma porosity/density sensor of the MSCL (Multi Sensor Core Logger). This piece of sensor costed 18,945 Euro, which was paid from the money saved during the first year from the student salaries under WP4a. The decision to purchase the sensor was based on the strong advice from the Advisory Committee. The item was purchased during the second period after obtaining the consent of the project officers. With the important gamma density sensor, the MSCL instrument is now complete with a set of sensors that can measure all

the standard physical parameters of the sediment cores at high resolution. This positive development facilitated a wider usage of the MSCL and participation of EMCOL in new projects and project proposals.

There was some deviation, again in a positive sense, regarding own staff contribution with costs not covered by the project. ITU contributed a total of four graduate students (one more than original plan) to the project on part-time basis. TUBITAK provided another two full-time graduate students starting with the project-month 11. The total efforts contributed to the project by the ITU (86 man-months) and TUBITAK (52 man-months) graduate students were 138 man-month that were not covered by the project. As result we had 10 graduate students instead of the originally planned 7, participating in the EMCOL project and obtaining training on the state-of-the-art methodology in natural hazards and environmental change studies in marine and lake basins.

4. Final Science and society reporting questionnaire

Contract No:17970

Science and Society Reporting Questionnaire

Introduction

FP6 was designed to focus, integrate, structure and strengthen the European Research Area (ERA). The influence of science and technology on society was acknowledged when the ERA was established and the importance of having a healthy dialogue between science and society was recognised. This area now forms part of the policy to structure the ERA under the heading Science and Society. It incorporates ethical, gender and communications issues together with issues affecting education and youth and governance.

This questionnaire has been compiled for FP6 Project Coordinators. It has been designed to help coordinators respond to contractual reporting requirements (Article II.10.3 of the contract states that consortia must engage with actors beyond the research community) and to facilitate the monitoring of the science and society dimension in FP6.

The information gathered through this exercise will be confidential and will not be disclosed to any third parties or used in any way that could be linked to individual projects.

Please complete the questionnaire by ticking boxes or filling out information where requested. It would be appreciated if as many questions as possible could be completed.

Please note that Part A will be completed automatically when the contract number is entered.

A General Information on Contractor

1	**Contract Number:**	INCO-CT-2005-017490
2	**Instrument:**	ACC-SSA-INCO
3	**Thematic Priority:**	Promotion of co-operation with ACC: Reinforcement of ACCs' Research capacities
4	**Title of Project:**	EMCOL (Eastern Mediterranean Centre for Oceanography and Limnology)
5	**Name and Title of Coordinator:**	Namık Çağatay, Prof.Dr.

6 **Period Covered, Start Date:** 01/05/05 **End Date:** 30/04/08

7 **EC Contribution to project:** € 900,000

B Ethics

8 **Which (if any) of the following does your research project involve?**

- ❑ Human beings
- ❑ Human biological samples
- ❑ Personal data
- ❑ Genetic information
- ❑ Animals
- ❑ Human embryos or human embryonic stem cells
- ❑ Non human primates and other animals
- ☑ None of the above

9 **To what extent do you believe ethical issues are relevant to your research project?**

- ✓ Not relevant
- ○ Minor relevance
- ○ Significant relevance
- ○ Critical

10 **Do you have Ethicists or others with considerable ethics experience involved in the project?**

- ○ Yes
- ✓ No

11 **Did your project have a separate EC ethical review?**

- ○ Yes
- ✓ No

12 **How much (including the value of time spent, as well as paid-out costs) do you estimate your project (when it is completed) will have spent on considering and dealing with ethical issues?**

€ None

C Gender (to be completed for all projects except IPs and NoEs)

13a Did you undertake Gender Equality Actions in your research project?

- ✓ Yes
- ○ No

13b If no, why not?

- ○ Not relevant
- ○ Team not gender aware
- ○ No budget
- ○ Not supported (no will)
- ○ Other:

13c If yes, which of the following actions did you carry out and how effective were they?

	Not at all effective				Very effective
☑ Design and implement an equal opportunity policy	○	○	○	✓	○
❑ Implement mentoring schemes for women	○	○	○	○	○
❑ Family friendly working conditions	○	○	○	○	○

14 Was there a gender dimension associated with the research content?

- ✓ Yes. If yes, please specify : Nilgün Okay, a task leader in EMCOL, observes and conducts studies on gender equality in EMCOL and in science in general.
- ○ No

15 How much (including the value of time spent, as well as paid-out costs) do you estimate your project (when it is completed) will have spent on considering and dealing with gender issues?

€ None

D Science Education, Training and Career Development

16a Does this project anticipate having a direct impact on the local economy?

- ✓ Yes
- ○ No

16b If Yes, is the project:

- ☑ Stimulating employment
- ☑ Retaining highly trained personnel
- ❑ Creating possible spin-out/start-up companies

17 Does your partnership employ and train researchers?

✓ Yes
○ No

18 Does your project involve working with young people at schools?

✓ Yes
○ No

19 Is there any education material being produced directly or indirectly by your project?

✓ Yes
○ No

20 How much (including the value of time spent, as well as paid-out costs) do you estimate your project (when it is completed) will have spent on considering and dealing with Science Education, Training and Career Development issues?

107,000 €

E Engaging With Actors Beyond the Research Community

20a Is the project likely to generate outputs (expertise or scientific advice) which could be used by policy makers?

✓ Yes
○ No

20b If Yes, is this a primary or secondary objective of the project?

○ Primary
✓ Secondary

21a Did your project engage in significant communication with the public before research commenced?

○ Yes
✓ No

21b Was the focus or methodology of your project modified in response to any communication with the public?

○ Yes
✓ No

22 Does your project involve someone whose role is solely to communicate with the public?

○ Yes
✓ No

F Use and dissemination

23 How many articles were published?

In refereed journals: 4 Other journals: 6 full &46 abstracts

24 How many patents have been applied for ?

None

25 How many other Intellectual Property Rights were applied for?

None

26 How many spin-offs were created? None

27 Have you issued press releases related to your project (and if so, how many)?

✓ Yes, number: 8
○ No

28 Have you held media briefings? If so, how many, and on average roughly how many journalists attended?

✓ Yes, number of briefings: 2 average number of journalists: 15
○ No

29a Roughly how many items covering your project in the printed press, on radio or television can you identify?

Press:	9	Radio:	None	Television:	3

29b Roughly how many items were:

Specialist Press:	None	Non-specialist Press:	12
National Press:	9	International Press:	3

30a Was there on-line information about the project?

- ○ Yes
- ✓ Specific web site
- ○ No

30b Roughly how frequently has it been updated?

Monthly

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31 Do you have an e-mail mailing list to send news about the project? If so, how many subscribers to the list are there?

- ✓ Yes, number of subscribers: 50
- ○ No

32a Have you created or participated in an event (e.g. workshop, conference, information day) in order to communicate with the public (not just other researchers or the press)?

- ✓ Yes
- ○ No

32b Roughly how many people attended these events and learned about your project?

1000

33a Have you produced a video or DVD film about your project?

- ○ Yes
- ✓ No

33b If so, how effective do you believe it has been in communicating with the public?

- ○ Unable to assess
- ○ Completely ineffective
- ○ Mostly ineffective
- ○ Partially effective
- ○ Significantly effective
- ○ Extremely effective

34a Have you produced posters, flyers or brochures about your project?

- ✓ Yes
- ○ No

34b If so, how effective do you believe they have been in communicating with the public?

- ○ Unable to assess
- ○ Completely ineffective
- ○ Mostly ineffective
- ○ Partially effective
- ✓ Significantly effective
- ○ Extremely effective

35 In how many different languages were these products (video/DVD, posters, flyers, brochures) produced?

2

36 How have you distributed these products (video/DVD, posters, flyers, brochures)? Please tick all methods you have used.

- ☐ Sent on request
- ☐ Sent to schools/academic institutions
- ☑ Distributed through government agencies/public buildings/libraries etc.
- ☐ Sent to potentially interested non-governmental bodies (NGOs, citizen's associations etc)
- ☑ Other: Distributed during scientific meetings, career days, and visits to EMCOL by visitors

G Total Communication Spend

37 How much (including the value of time spent, as well as paid-out costs) do you estimate your project (when it is completed) will have spent on communication activities (engaging with the public, use and dissemination) as described in the current questionnaire?

€ 15,000

H Comments

38 If you have any comments about your experience of meeting the Science and Society objectives within your project, or any suggestions of improvements to the programme please add them here:

During the Carrier Dat of the Faculty of Mines (İTU) and national and international scientific meetings, students, scientists and professionals showed great interest in EMCOL. These activities have increased networking with other organizations and participation of EMCOL in collaborative projects.

We have frequent visits by journalists, scientists and school children to the EMCOL facilities. These visits are effective in increasing the visibility of EC Framework Programme as well as the EMCOL as a research centre.

Thank you for your help!

[Submission instructions will need to be elaborated by those that set up the questionnaire on the Internet].

5 – Final reporting questionnaires on workforce statistics

Contract No:17970

WORK FORCE STATISTICS
FINAL REPORT

This report is part of the final reporting to be completed by the contractors of all projects except IPs and NoEs at the end of the project.

1. GENERAL INFORMATION

1.1. Contract No.: INCO-CT-2005-17490

1.2. Thematic priority: Promotion of co-operation with ACC: Reinforcement of the ACCs' Research capacities

1.3. Instrument: ACC-SSA

1.4. Project Acronym:[3] EMCOL

1.5. Period covered (Start Date – End Date)[1]: 1.May.2005 30.April.2008

1.6. Name and title of co-ordinator[1]: Namık Çağatay, Prof.Dr.

1.7. Name and title of contractor: Istanbul Technical University (ITU)

2. SCIENTIFIC LEADERSHIP AND MANAGEMENT, AND WORKFORCE STATISTICS FOR THE PROJECT TO BE COMPLETED BY CONTRACTORS

Please complete the table below on a headcount basis

Type of Position	Number of Women	Number of Men	Total	% Women	% Men
Scientific manager	0	1	1	0	100
Scientific team leader / work package manager	1	4	5	20	80
Experienced researcher (> 4 years)	1	2	3	33	67
Early researcher (<= 4 years)	0	1	1	0	100
PhD + MSc students	6	3	9	67	33
Technical staff	0	2	2	0	100
Other (secretary)	1	0	1	100	0

6. Final Socio-economic reporting questionnaire

Contract No:17970

SOCIO-ECONOMIC REPORTING QUESTIONNAIRE

(To be completed by each contractor in the project)

INTRODUCTION

In the process of building the European Research Area, democratic governance must ensure that social and economic issues are taken into consideration in the research activities and that citizens are informed about and aware of the social aspects with regard to scientific and technological progress. In this context, it is also acknowledged that the benefits of research in support of socio-economic policy challenges would be enhanced by an appropriate integration of socio-economic research dimensions.

The importance of the integration of socio-economic aspects in research was recognised in FP6 and should be duly taken into consideration by contractors where relevant for the actions concerned in horizontal and thematic activities of FP6.

This questionnaire applies to all projects and must be filled in by each contractor in the project. It is designed to facilitate the monitoring of the integration of the socio-economic dimensions in FP6 and to finally support the assessment of the research that will guide the future policy formulations and decisions.

The submission of this questionnaire will be done on-line. The details of the procedure to be used will be communicated by the Commission to the project coordinator in due time.

The information gathered through this exercise will be kept confidential and will not be disclosed to any third parties or used in any way that could be linked to individual projects.

QUESTIONS

1.1 Do your tasks in the project include socio-economic research activities[4] ?	*No*
1.2 If "Yes", what is the estimated total budget allocation that addresses these activities ?	*N/A*
2.1 Do your tasks in the project include foresight methods[5] ?	*N/A*
2.2 If "Yes", what is the estimated total budget allocation that addresses these activities?	*N/A*
3. How many person/months (estimated) are allocated to researchers with a background in social sciences[6], to perform your tasks for the project ?	*None*