PERSEUS

POLICY-ORIENTED MARINE ENVIRONMENTAL RESEARCH IN THE SOUTHERN EUROPEAN SEAS

# Training course in Cyprus

## Milestone Nr. 42

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| **Responsible** | | Dr. A. Drago | |
| **Authors & Institutes Acronyms** | | Abu Alhaija, R. (CyI), Jimenez, C. (CyI), Lange, M. (CyI) | |
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| | | **Confidential, only for members of the consortium (CO)** | ● |

# CONTENTS

Executive summary / Abstract

The present milestone includes the minutes and results of the Continuous Plankton Recorder (CPR) Workshop that took place in Nicosia, Cyprus, September 28-30. The CPR is a plankton sampler operated by a ship of opportunity, designed for long term monitoring surveys. The workshop aimed to offer a holistic overview of the process required in order to set up a new CPR survey, operate the CPR, sample analysis and meta-analysis. Participants had the opportunity to give short presentations of their interests and their institutions, take part in demonstrations and gain hands-on experience of CPR sample handling and analysis. The workshop included on-location demonstration of CPR operation by the chemical tanker PETROLINA OCEAN and discussions with vessel officials, the captain and crew. Presentations also offered an overview of already established surveys and results offered from CPR data. The final session of the event was dedicated to setting up a road-map towards the establishment of new routes and surveys in the Mediterranean and Black Sea through a commonly established CPR network where The Cyprus Institute may operate as a hub to provide expertise to other CPR lines.

## SCOPE

The training course aims to establish a native (Mediterranean) capacity in operating the Continuous Plankton Recorder (CPR). This objective is especially significant since plankton populations in open Mediterranean waters are scarcely sampled especially in the easternmost part of the basin. In addition, CPR deployment in the Mediterranean has been limited an only in the Western Mediterranean. PERSEUS has laid the grounds for a Mediterranean operated CPR survey, building capacity and transferring knowledge to the region. Through the workshop, the formation of a regional network initiates the efforts for regular CPR surveys in the Mediterranean and Black Sea.

## ABBREVIATIONS

CPR: Continuous Plankton Recorder
CyI: The Cyprus Institute, Cyprus
MedCPR: Mediterranean CPR survey
CyCPR: CPR facility at CyI
NTL: Novel Technologies Laboratory building, CyI
UoM: University of Malta
SOCIB: Balearic Islands Coastal Observing and Forecasting System, Spain
HCMR: Hellenic Centre for Marine Research, Greece
UM: University of Messina, Italy
OGS: Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Italy
IOF: Institute of Oceanography and Fisheries, Croatia
OC-UCY: Oceanography Centre- University of Cyprus, Cyprus
DFMR: Department of Fisheries and Marine Research, Cyprus
IFR: Institute of Fish Resources, Bulgaria
UoL: University of Lebanon, Lebanon
UoS: University of Salento, Italy
UK: United Kingdom
SAHFOS: Sir Alister Hardy Foundation for Ocean Science, UK
GACS: Global Alliance for CPR surveys
POEM: Physical Oceanography Of The Eastern Mediterranean project
SOOP: Ship Of Opportunity
SZN: Stazione Zoologica Anton Dohrn, Italy
IEO: Spanish Oceanographic Institute
IBER-BAS: Biodiversity and Ecosystem Research-BAS, Laboratory of Marine Ecology
MSFD: Marine Strategy Framework Directive

## TITLE

Training Course on the Implementation of the Continuous Plankton Recorder within the Mediterranean and Black Seas

## 1. Background

The "Training Course on the Implementation of the Continuous Plankton Recorder (CPR) within the Mediterranean" was held on 28-30 October, 2015, at the Novel Technologies Laboratory building within the campus of The Cyprus Institute (CyI) in Nicosia, Cyprus.

The training course aimed to expand on the knowledge and capacity building initiated thought the PERSEUS project in operating the CPR in the South European Seas. This objective is especially significant since the CPR can collect quality biological and physical data with high temporal and spatial coverage at low operational costs. CPR transects usually cover commercial routes between two ports and are operated by Ships of Opportunity (SOOPs). CPR sample analysis protocol is almost a century old it is followed by a handful of laboratories which realize the survey around the world. Up until 2012 the CPR had sampled over six million miles of the worlds' oceans and has provided data for over two hundred scholarly articles many of which in high ranking scientific journals.

## 2. Participants

In total, the workshop was attended by 15 participants, which included four lecturers, two invited guests and nine successful applicants from several marine research institutions in the Mediterranean and Black Sea. An application call for the participation in the workshop was published through work-package eight leader institution (Dr. Alan Deidun, University of Malta (UoM)) in April, 2015. The call was publicized through the PERSEUS network by email, the project website (http://www.perseus-net.eu/site/content.php?locale=1&locale_j=en&sel=398&artid=2932), the CyI website (http://www.cyi.ac.cy/component/k2/item/1058-announcement-of-the-cpr-training-course.html) and other relative networks to include plankton researchers from non-partner institutions. The call ended on July 20th, by which time seventeen applications were sent to Dr. Alan Deidun. The participant selection committee (C. Jimenez and R. Abu Alhaija (CyI), J. Tintore, Balearic Islands Coastal Observing and Forecasting System (SOCIB), A. Deidun (UoM), N. Streftaris and E. Papathanassiou, Hellenic Centre for Marine Research (HCMR)) evaluated candidates regarding to the relevance of their work to the CPR survey and their potential in actively participating in a CPR regional network. A list of the workshop participants is given in (Table 1).

# 3. Workshop Agenda

The workshop lasted three days. The structure of the agenda aimed in the building of a consortium of researchers having common knowledge of the CPR operation and potential use in the Southern European Seas (SES). All participants were invited to present their work and their respective forward outlook for the CPR network, which were followed by presentations on the operation of the CPR and the establishment of a new survey. In order to have hands on experience the workshop included a field trip to the SOOP PETROLINA Ocean as well as technical and sample analysis demonstrations. Finally, the meeting closed with a round-table discussion on the future of the CPR in the Southern European Seas. Please see Annex I, for the complete agenda.

**Table 1: Table of Participants (for Institution names please see list of abbreviations pg. 7)**

| | Name | Country | Institution | Email |
|---|---|---|---|---|
| 1 | Jean Sciare | Cyprus | CyI | j.sciare@cyi.ac.cy |
| 2 | Carlos Jimenez | Cyprus | CyI | c.jimenez@cyi.ac.cy |
| 3 | Rana Abu Alhaija | Cyprus | CyI | r.abualhaija@cyi.ac.cy |
| 4 | Giuseppe ARENA | Italy | UoM | pinoarena@unime.it |
| 5 | Valentina TIRELLI | Italy | OGS | vtirelli@ogs.trieste.it |
| 6 | Stefano PIRAINO | Italy | UoS | stefano.piraino@unisalento.it |
| 7 | Yianna SAMUEL-RHOADS | Cyprus | OC-UCY | rhoads.yianna@ucy.ac.cy |
| 8 | Marilena APLIKIOTI | Cyprus | DFMR | maplikioti@gmail.com |
| 9 | Veselina Vasileva MIHNEVA | Bulgaria | IFR | vvmihneva@yahoo.com |
| 10 | Olja VIDJAK | Croatia | IOF | vidjak@izor.hr |
| 11 | Sami LAKKIS | Lebanon | LU | slakkis@ul.edu.lb |
| 12 | Nondas CHRISTOU | Greece | HCMR | edc@hcmr.gr |
| 13 | Jennifer SKINNER | UK | SAHFOS | jenski@sahfos.ac.uk |
| 14 | Ilias ABUALHAIJA | Cyprus | SET | i.abualhaija@gmail.com |
| 15 | George FYTTIS | Cyprus | OC-UCY | fyttis.georgios@ucy.ac.cy |

# 4. Workshop Minutes

The three-day workshop included presentations, demonstrations of CPR methodology and hands-on training in CPR operation and sample analysis.

## 4.1. Welcome and Opening Remarks

Dr. Jean Sciare, Director of the Energy, Environment and Water Research Centre of CyI, welcomed the participants of the workshop and opened the meeting with a brief overview of the research conducted at the CyI followed by a message to the participants to "take advantage of this unique opportunity to establish a strong network of collaborative research".

Following this, Carlos Jimenez welcomed all workshop participants and introduced the agenda (ANNEX I) which was modified in order to accommodate the vessel itinerary for the field-trip to the commercial vessel, voluntarily operating the CPR on-behalf of the CyI.

## 4.2. Presentations by participants- September 28

### 4.2.1. Carlos Jimenez (Associate Researcher, CyI)

C. Jimenez gave a presentation of the general interests and running projects of the Marine Science Group operating through at the CyI. Research presented included benthic studies, marine speleology and paleoecology and plankton ecology with emphasis on collaborative projects with local and international institutions (Figure 2A).


**Figure 1: MedCPR workshop participants (left to right: S. Lakkis, R. Abu Alhaija, O. Vidjak, E. Cadd, J. Skinner, C. Jimenez, V. Vesselina, M. Aplikioti, I. Abualhaija, G. Arena, S. Piraino, V. Tirelli, N. Christou, Y. Samuel-Rhoads)**

### 4.2.2. Giuseppe Arena (Senior Technician, University of Messina (UM), Italy)

G. Arena presented an overview of the plankton research preformed at the University of Messina in South Adriatic, the Atlantic Ocean and at the Italian base in Antarctica in collaboration with other Italian institutions. He also offered a brief description of instruments used by UM to sample and analyze plankton, including a device that was designed for the continuous collection of plankton but had several shortcomings and therefore its use was discontinued.

### 4.2.3. Valentina Tirelli (Permanent researcher, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Italy)

V. Tirelli's presentation focused on the zooplankton research preformed at OGS and general results of plankton studies in the Adriatic Sea. She concluded by stressing out the importance of increased spatial and temporal sampling intensity, opportunistic plankton sampling and surveys with low operational costs such as the CPR survey.

The presentation was followed by a discussion on the possibility of operating the CPR survey within monitoring schemes guided by the Marine Strategy Framework Directive (MSFD), micro-plastic monitoring and other research questions.

#### 4.2.4. Olja Vidjak (Research Scientist, Institute of Oceanography and Fisheries (IOF), Croatia)

In order to conclude the talk on Adriatic plankton, O. Vidjak followed the presentation by Valentina, presenting the zooplankton group of the IOF and the international (e.g. EMBOS, BALMAS and PERSEUS) and local projects and they are involved in. Olja described long term plankton monitoring systems maintained in the coast of Croatia and the need to expand the research further from the coast. Concluding she noted the logistical and operational obstacles that may arise from a basin wide CPR survey, adding that many of these issues could be resolved within a multi-institutional, multinational collaborative network.

#### 4.2.5. Yianna Samuel-Rhoads (Research Scientist, Oceanography Centre-University of Cyprus (OC-UCY), Cyprus)

Yianna provided a description of the plankton related studies in the OC-UCY which include both in-situ sampling and remote sensing media. Yianna made the point that the CPR initiative could be coupled with current capabilities shared by the network such as other methods of plankton collection and sample analysis.

#### 4.2.6. Stefano Piraino (Professor, University of Salento (UoS), Italy)

Stephano's group focuses the study of jelly-fish by molecular means, sample collection and public science. He indicated that the strength of the CPR is that it is a versatile tool that can be used to answer a multitude of research questions including the biogeography of jelly-fishes. New CPR routes could be designed to overlap with oceanographic and other plankton sampling thus complimenting results and linking CPR with previous studies.

#### 4.2.7. Marilena Aplikioti (Fisheries and Marine Research Officer, Department of Fisheries and Marine Research (DFMR), Cyprus)

Marilena's presentation focused on the role that governmental institutions as the DFMR may have within a CPR network. She foresees that their interest would heavily lay in the ability of the CPR to be implemented within a wider monitoring network for marine environmental research. CPR results could be used and incorporated to answer national obligations towards the Marine Strategy Framework Directive (MSFD) especially for countries where baseline information is largely absent like in the case of Cyprus.

#### 4.2.8. Veselina Vasileva (Associate Professor, Institute of Fish Resources (IFR), Bulgaria)

Vesselina compared and contrasted zooplankton research in the Mediterranean and Black Sea where a limited number of zooplankton species are found in fluctuating numbers. Vesselina also made the point that plankton information comes mostly from the coast and that the CPR has the potential to fill the gap in plankton monitoring systems.

#### 4.2.9. Nondas Christou (Researcher, Hellenic Centre for Marine Research (HCMR), Greece)

Nondas focused his presentation on the Physical Oceanography Of The Eastern Mediterranean project (POEM) which was among the first projects to sample long transects in the Eastern Mediterranean Sea for physical data and plankton. Nondas concluded that even within a system of limited CPR cruises per year (e.g. two) for a given cross basin transect could provide valuable information to inform environmental policy-makers including in regards to climate change.

*Note: The following two presentations took place on the second day*

#### 4.2.10. Sami Lakkis (Planktonologist, University of Lebanon (UoL), Lebanon)

Through the seminar series of the CyI, Sami gave an extensive presentation of plankton studies in the Eastern Mediterranean with an emphasis on assemblages found by his laboratory in the Lebanese coast (Figure 1B).

#### 4.2.11. Jennifer Skinner (Plankton Analyst, Public Engagement and Education Officer, Sir Alister Hardy Foundation for Ocean Science (SAHFOS), United Kingdom)

The Sir Alister Hardy Foundation for Ocean Science (SAHFOS), Plymouth, UK has since its inception worked solely on the operation of the CPR survey, mainly in the Atlantic Ocean and around the British coast. Jennifer gave an overview of the past and current work at SAHFOS, the multitude of research questions answered by the CPR and how new surveys can be facilitated through SAHFOS and the Global Alliance of CPR Surveys (GACS).




**Figure 2: Presentations in the MedCPR workshop gave a holistic overview of the challenges of operating the CPR in the Levantine Sea: A) C. Jimenez; (Photo credit: S. Piraino) B) S. Lakkis; C) R. Abu Alhaija; D) J. Skinner**

## 4.3. CPR training

After the initial introductory presentations the workshop continued with a series of targeted presentations and demonstrations around the initiation and operational requirements for the CPR survey. The lessons stemmed from the experience of the CyI in establishing a CPR route and a CPR facility (CyCPR). This innovative for the region task, was initiated in 2012 and achieved mainly through the PERSEUS project.

### 4.3.1. CPR Method Overview, Rana Abu Alhaija

The first presentation for this section gave an introduction into CPR surveys and a brief description of CPR sampling and sample analysis as well as the equipment and resources required such as a wet laboratory and collaboration with a commercial vessel.

### 4.3.2. Initiating CPR operation for a newly formed survey, Carlos Jimenez

Next, Carlos focused on the energies that have to be taken prior to the initiation of the operation of the CPR. These will include contacting port authorities, shipping companies and resolving territorial/transboundary issues (Figure 2).

### 4.3.3. CPR device: function and maintenance, Ilias Abu Alhaija, Carlos Jimenez

For this session, all participants moved to the CPR Facility at CyI (CyCPR), within the Novel Technologies Laboratory Building, were the CPR device and instruments are kept. Carlos and Ilias gave an overview of the CPR parts and their function during sampling (Figure 3). Subsequent, Ilias demonstrated how the sample can be removed from the CPR internal, how the device is maintained and the process of preparing the CPR for sampling (Figure 3).


**Figure 3: Demonstration of CPR parts (A), maintenance and preparation of CPR for sampling (B)**

### 4.3.4. Field trip to Ship of Opportunity (SOOP): onboard operations

To acquire a full appreciation of the CPR operation, participants were transported to the port were they boarded the SOOP, PETROLINA OCEAN, voluntarily towing the CPR, on the second day of the workshop. The participants were received by the vessel's agent, Christos Diakou, the technical superintendent, Valentin Gumenyuk,

and captain, Ermolaev Aleksandr. After a tour of the vessel installations, crew members aided in demonstrating how the CPR is towed by the vessel (Figure 4).

#### 4.3.5. Onboard CPR operations, C. Jimenez

Back at the CyI, Carlos presented the range of qualifications a vessel should have in order to tow the CPR and focused on the importance of building rapport with vessel stakeholders.

#### 4.3.6. View of Onboard operations video

Following, participants viewed a video created by CyI for the training of vessel crew on CPR towing operations. The video includes footage of CPR tow in the Levantine by the PETROLINA OCEAN.


**Figure 4: Visit to the commercial vessel voluntarily participating in the MedCPR survey. Captain Ermolaev Aleksandr giving a tour of the vessel and sharing with workshop participants his experience of the CPR survey; B) Vessel crew demonstrating CPR onboard operations; C) Vessel agent, Christos Diakou and J. Skinner discussing the benefits of a multinational CPR network. .**

#### 4.3.7. Post-sampling data consolidation and sample analysis, J. Skinner, R. Abu Alhaija

The morning session of the third and final day of the workshop was devoted to the analysis of CPR samples. Initially Jennifer and Rana gave a presentation on how time and position information from the vessel can be translated to sampling positions through diverse software solutions and algorithms. Subsequently, a detailed demonstration of CPR sample analysis took place in the Chemical Laboratory at the

NTL building (Figure 5). Utilizing CPR samples from the Levantine, Rana illustrated the process of marking CPR samples, assigning Phytoplankton Color Index and cutting samples from the long strip of mesh. Next, already cut samples were used to demonstrate the phytoplankton traverse, zooplankton traverse and zooplankton eye count methods for CPR sample on-silk analysis. The participants had the opportunity to handle samples under the microscope, view specimens as they appear on-silk after CPR sampling and identify potential operational and logistical constrains of CPR analysis in their home institutions.

#### 4.3.8. Post-analysis and quality assessment in CPR Surveys, J. Skinner

Jennifer presented the steps taken after sample analysis to ensure that results are comparable among samplings and plankton analysts.

#### 4.3.9. Global Alliance for CPR Surveys (GACS), R. Abu Alhaija

Rana gave the participants an overview of the global perspectives of CPR surveys, operating from several laboratories. The presentations focused on the scientific achievements of CPR surveys, and in extend the potential of a Mediterranean and Black Sea CPR survey.


**Figure 5: Demonstration of CPR sample marking, Phytoplankton Colour Index asseration (A, B) and CPR sample analysis (C). D) Zooplankton on silk, photographed by S. Piraino during the sample analysis session.**

### 4.4. Interactive session: A CPR network in the Mediterranean and Black Sea

The workshop final session was dedicated to discussions around a common proposal for the establishment of new collaborative CPR routes in the Mediterranean and Black Sea.

At the beginning of the session Nondas gave a presentation suggesting the name CYPRIS for a proposal to operate the CPR survey in the Mediterranean through Cyprus, with participants positively receiving the suggestion.

Subsequently, Carlos opened the discussions with a brief overview of the proceedings of the past sessions and the general goal of the workshop, to induce the initiation of a CPR network in the Mediterranean and Black Seas.

Participants deliberated on the form that a potential research project could take, funding agencies that could support it and additional collaborators that would be interested to participate.

The proposed targeted areas for sampling were the Adriatic, the Aegean, the Ionian and Black Seas. The areas are frequently crossed by commercial vessels which could complement Research Vessel contribution to the project. Both CyI and OGS have experience with the involvement of SOOPs in research. CyI, OGS, HCMR, IFR and IOF can offer the expertise of plankton analysis for Mediterranean and Black Sea specimens, while SAHFOS could provide equipment, consumables and training on CPR sample analysis. The participants, realizing the versatility of the CPR, agreed that several means can be followed for the realization of a CPR network. Examples are the initiation of a number of routes operating from Cyprus and the analysis of samples by several laboratories within the network.

The EU funding schemes “Horizon 2020” and “MED” were identified as potential means to fund the initiative. In addition, national, bilateral or sub-regional funding schemes, such as the “Black Sea Cross Border Cooperation Program” and “Adrion”, can fuel smaller scale projects or specific routes. The Stazione Zoologica Anton Dohrn (SZN), Italy, Observatoire Océanologique de Villefranche, France, the Spanish Oceanographic Institute (IEO), Spain, the Institute of Oceanic and Israel Oceanographic and Limnological Research, State of Israel, the Institute of Oceanology -Varna, Bulgaria, the Institute of Biodiversity and Ecosystem Research-BAS, Laboratory of Marine Ecology (IBER-BAS)- Sofia, Bulgaria, the NIMRD "Grigore Antipa" - Constanta, Romania; NIRD GeoEcoMar – Romania and private shipping companies, were identified as potential additional collaborators within this proposed project.

Results from the envisioned project would be used to fill the gap in information for the state of the seas, which can be used by national policy-making bodies. CPR long-term data on water column habitats (mainly zooplankton), especially in the open-sea, can fill essential knowledge gaps and improve the assessment of Good Environmental Status of the marine waters as it is defined in the Marine Strategy Framework Directive (MSFD), regarding the following Descriptors: D1. Biological diversity – Water Column Habitats; D2 - Non-indigenous species; D4 Food webs. In UK, SAHFOS has a key involvement in the development and usage of MSFD indicators at the national and OSPAR level, a model which could be duplicated by other partners.

In the future, results of the regional CPR surveys could be disseminated through international conferences, such as the ICES/PICES Zooplankton Production Symposium.

## 5. Workshop Impact

The CPR workshop was well received form the participants, PERSEUS partners and stakeholders. The event was covered by the local media hence informing the public in regards to the CPR initiative (See ANEX III for the relevant articles). The workshop provided the opportunity to a wider group of interested laboratories to experience a holistic overview of the operation of the CPR survey, sample analysis, the inclusion of a commercial vessel in scientific research, the setup of a CPR facility and the potential of scientific results from the survey for the area.

A table, where willing participants could input information towards the initiation of a CPR network was circulated after the end of the workshop. The compilation of the input of the participants regarding their respective envisioned role in a Mediterranean wide CPR survey is given in (Table 2).

It is expected that, networking, ideas and collaborations forged during the workshop will lead to a better understanding of the implications of the CPR survey in the region, the consolidation of the CPR route and eventually the expansion of CPR sampling.

**Table 2: Interested collaborators and potential contributions to a CPR regional network (CyI: The Cyprus Institute; HCMR: Hellenic Centre for Marine Research; SHFOS: Sir Alister Hardy Foundation for Ocean Science; DFMR: Department of Fisheries & Marine Research; IOF: Institute of Oceanography and Fisheries; IFR: Institute of Fish Resources; OGS: Istituto Nazionale di Oceanografia e di Geofisica Sperimentale; OC-UCY: Oceanography Centre, University of Cyprus)**

| Scientist | Institution | Country | Institution /State | Infrastructure | Present Capacity/ Future Contribution |
|---|---|---|---|---|---|
| Rana Abu Alhaija | CyI | Cyprus | Research/Private | CyCPR facility | CPR operation; CPR sample analysis; Capacity building; CPR knowhow; commercial vessel network |
| Epaminondas Christou | HCMR | Greece | Research/ Public | field equipment; zooplankton lab | Plankton taxonomy; Taxonomy training; Research Vessel; Laboratory Potential sample analysis |
| David Johns | SAHFOS | UK | Charity | Complete CPR infrastructure and capacity | Supply of CPR(s), internal(s) and other CPR material and consumables; Workshop and sample analysis training volunteer ship programme; technical advice and how to order consumables; Console and training in its use; sample analysis and storage |
| Marilena Aplikioti | DFMR | Cyprus | Governmental Agency/ Public | R/V; laboratories; Sampling equipment | Water sample analysis; Communication with local authorities |
| Olja Vidjak | IOF | Croatia | Research/ Public | R/V (routine surveys in the Adriatic);plankton lab | Plankton Historical data (Adriatic); Plankton identification; Taxonomy training; Potential for sample analysis |
| Vasselina Mihneva | IFR | Bulgaria | Research/ Public | Plankton net samplers; microscopes | Plankton identification; Potential operation of CPR and sample analysis |
| Valentina Tirelli | OGS | Italy | Research/ Public | R/V; Laboratories; Scientific and technical staff | Plankton taxonomy training; Potential for sample analysis (w/ formalin extractor); Knowledge in Adriatic marine traffic |
| Yianna Samuel-Rhoads | OC-UCY | Cyprus | Academic/Public | Zooscan; Plankton Nets; Plankton Lab | Potential for sample analysis |

## ANNEX I: WORKSHOP AGENDA

**Sunday 27th September 2015**

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|---|---|
| 21:00 – 23:00 | **Icebreaker/Welcome Reception**<br>*Baroque Lounge, The Cleopatra Hotel* |

**Monday 28th September 2015**

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|---|---|
| 09:00 – 09:30 | **Welcome**<br>*Jean Sciare, Director of the Energy, Environment and Water Research Center (EEWRC)* |
| 09:30 – 10:00 | **Presentation of the Marine Science research at CyI**<br>*Carlos Jimenez* |
| 10:00 – 10:45 | **Presentations by participants on their back-ground, how CPR approach is important for them and how they intend to use CPR in their institution**<br>*Giuseppe Arena, Valentina Tirelli, Yianna Samuel-Rhoads* |
| 10:45 – 11:00 | **Coffee break** |
| 11:00- 12:15 | **Continuation of Presentations by participants**<br>*Stefano Piraino, Marilena Aplikioti, Veselina Vasileva, Olja Vidjak, Nondas Christou* |
| 12:15-13:00 | **Implementation of the survey- planning stage: infrastructure, equipment and method overview**<br>*Rana Abu Alhaija* |
| 13:00 – 14:00 | **Lunch** |
| 14:00 – 14:45 | **Implementation of the survey - pre-sampling: port authorities, shipping companies and their importance for the survey, territorial/transboundary issues**<br>*Carlos Jimenez* |

**Cy CPR Facility**

14:45– 15:00 **Introduction to the laboratory**

*Carlos Jimenez & Rana Abu Alhaija*

15:00 – 17:00 **Implementation of the survey-pre and post sampling: Demonstration on the maintenance, service and preparation of the CPR and internal**

*Carlos Jimenez & Ilias Abu Alhaija*

**Tuesday 29th September 2015 (morning/noon program subjected to change)**

08:30 Bus pick-up from Cleopatra Hotel to Port

09:00 – 12:30 **Transport of the CPR to the vessel; contact with vessel stakeholders**

12:30 Return to CyI

13:00 – 14:00 **Lunch**

14:00 – 14:30 **Implementation of the survey - sampling stage: CPR on-board operations; vessel minimum qualifications and towing the CPR**

*Carlos Jimenez*

14:30– 15:00 **Viewing of the on-board operations video**

15:15 – 16:00 **Presentation of SAHFOS**

*Jennifer Skinner*

**1st Floor Conference Room**

16:00 – 17:00 **Public Seminar 'Marine Zooplankton of Lebanon: Biology, Biodiversity, Biogeography'**

*Sami Lakkis*

20:00 **Workshop Dinner at Mezostrati Taverna**

**Wednesday 30th September 2015**

**Cy CPR Facility**

| | |
|---|---|
| 9:00 – 9:30 | **Implementation of the survey- post sampling: Determination of sample location, Sample standardisation CONSOLE/EXCEL/ MATLAB**<br>*Rana Abu Alhaija & Jennifer Skinner* |
| 09:30 – 10:30 | **Implementation of the survey- Sample Analysis: Demonstration of Phytoplankton Colour index, Phytoplankton transect, Zooplankton transect and Zooplankton eye count analysis methods**<br>*Rana Abu Alhaija & Jennifer Skinner* |
| 10:30 – 10:45 | **Coffee break** |
| 10:45 – 12:00 | Continuation of **Demonstration of CPR sample analysis methods**<br>*Rana Abu Alhaija & Jennifer Skinner* |
| | **1st Floor Conference Room** |
| 12:00 – 12:30 | **Post Analysis Procedures- Large scale surveys: Data/ sample storage, Console- Check blocks- QA/QC**<br>*Jennifer Skinner* |
| 12:30 – 13:00 | **A world of CPR: The Global Alliance for CPR Surveys (GACS)**<br>*Rana Abu Alhaija* |
| 13:00 – 14:00 | **Lunch** |
| 14:00 – 17:00 | **Interactive Questions session- Special considerations of participants. Analyse the case of each participant & Initiation of a common proposal for a CPR network in the Mediterranean and Black Sea** |

## ANNEX II: PARTICIPANTS PRESENCE LOG

**Monday 28th September 2015**

| | Name | Signature |
|---|---|---|
| 1 | Ilias ABUALHAIJA | |
| 2 | Rana ABUALHAIJA | |
| 3 | Marilena APLIKIOTI | |
| 4 | Giuseppe ARENA | |
| 5 | Nondas CHRISTOU | |
| 6 | Yiorgos FYTTIS | |
| 7 | Carlos JIMENEZ | |
| 8 | Sami LAKKIS | |
| 9 | Veselina Vasileva MIHNEVA | |
| 10 | Stefano PIRAINO | |
| 11 | Yianna SAMUEL-RHOADS | |
| 12 | Jennifer SKINNER | |
| 13 | Valentina TIRELLI | |
| 14 | Olja VIDJAK | |

**Tuesday 29th September 2015**

| | Name | Signature |
|---|---|---|
| 1 | Ilias ABUALHAIJA | |
| 2 | Rana ABUALHAIJA | |
| 3 | Marilena APLIKIOTI | |
| 4 | Giuseppe ARENA | |
| 5 | Nondas CHRISTOU | |
| 6 | Yiorgos FYTTIS | |
| 7 | Carlos JIMENEZ | |
| 8 | Sami LAKKIS | |
| 9 | Veselina Vasileva MIHNEVA | |
| 10 | Stefano PIRAINO | |
| 11 | Yianna SAMUEL-RHOADS | |
| 12 | Jennifer SKINNER | |
| 13 | Valentina TIRELLI | |
| 14 | Olja VIDJAK | |

**Wednesday 30th September 2015**

| | Name | Signature |
|---|---|---|
| 1 | Ilias ABUALHAIJA | |
| 2 | Rana ABUALHAIJA | |
| 3 | Marilena APLIKIOTI | |
| 4 | Giuseppe ARENA | |
| 5 | Nondas CHRISTOU | |
| 6 | Yiorgos FYTTIS | |
| 7 | Carlos JIMENEZ | |
| 8 | Sami LAKKIS | |
| 9 | Veselina Vasileva MIHNEVA | |
| 10 | Stefano PIRAINO | |
| 11 | Yianna SAMUEL-RHOADS | |
| 12 | Jennifer SKINNER | |
| 13 | Valentina TIRELLI | |
| 14 | Olja VIDJAK | |

# ANNEX III: MEDIA COVERAGE OF THE MEDCPR WORKSHOP

## Article featuring in Cyprus News Agency

The following article featured on the webpage of the Cyprus News Agency on November 10, 2015. The article can be accessed through the following link: http://www.cna.org.cy/photoinfo.asp?id=411571bc8da841c48824f0a13d7bb730

ΚΥΠΕ
CNA
Κυπριακό Πρακτορείο Ειδήσεων

**ΙΝΣΤΙΤΟΥΤΟ ΚΥΠΡΟΥ – ΕΥΡΩΠΑΪΚΟ ΠΡΟΓΡΑΜΜΑ PERSEUS**

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Εργαστήριο για την καινοτόμο μέθοδο παρακολούθησης του πλαγκτόν στην Ανατολική Μεσόγειο διοργάνωσε η Ομάδα Θαλάσσιας Επιστήμης (MSG) του Ινστιτούτου Κύπρου (IKu), στο πλαίσιο του Ευρωπαϊκού προγράμματος PERSEUS.

Σκοπός της έρευνας, η οποία ξεκίνησε τον Οκτώβριο του 2014, είναι η συγκέντρωση πληροφοριών σχετικά με την Καλή Περιβαλλοντική Κατάσταση της θάλασσας της Μεσογείου και της Μαύρης Θάλασσας, ώστε να λειτουργήσει ως βάση για την ανίχνευση μελλοντικών αλλαγών.

Η Ομάδα Θαλάσσιας Επιστήμης του IKu, έχει μεταφέρει στην Ανατολική Μεσόγειο την τεχνογνωσία της και την υποδομή της συσκευής για την χρήση CPR (Continuous Plankton Recorder) για τη δειγματοληψία πλαγκτόν, δηλαδή των μικροσκοπικών θαλάσσιων οργανισμών που συνθέτουν το κάτω μέρος της υδάτινης τροφικής αλυσίδας. Η παρακολούθηση του πλαγκτόν δίδει πληροφορίες για την παραγωγικότητα και την υγεία των θαλασσών και μπορεί να αξιοποιηθεί ως δείκτης κλιματικών αλλαγών και ρύπανσης.

Παρά το γεγονός ότι οι προδιαγραφές και το πρωτόκολλο του CPR έχουν σχεδιαστεί σχεδόν έναν αιώνα πριν, με συνεχείς περισυλλογές δειγμάτων πλαγκτόν με το CPR στη Βόρεια Θάλασσα ξεκινώντας το 1931 κυρίως στον Ατλαντικό και τον Ειρηνικό Ωκεανό, ο στόχος είναι να προσαρμοστεί και να χρησιμοποιηθεί στην λεκάνη της Μεσογείου με πανομοιότυπο τρόπο. Αξίζει να σημειωθεί, ότι αυτή είναι η πρώτη φορά που το CPRχρησιμοποιείται στην Ανατολική Μεσόγειο, ενώ είναι πολύ σημαντικό το γεγονός ότι για πρώτη φορά διενεργείται τέτοια έρευνα σε μια Μεσογειακή χώρα.

Το CPR λειτουργείται από «πλοία ευκαιριών» - "ships of opportunity", τα οποία το ρυμουλκούν σε ναυτιλιακές εμπορικές οδούς. Για τις ρυμουλκήσεις που εκτελούνται από την MSG, το δεξαμενόπλοιο PETROLINA OCEAN, που ανήκει στον Όμιλο Αδελφοί Λευκαρίτη και το διαχειρίζεται η Columbia Shipmanagment, προσφέρθηκε εθελοντικά να ρυμουλκήσει το CPR. Το CPR τοποθετήθηκε στο νερό για πρώτη φορά στην Ανατολική Μεσόγειο στις 21 Οκτωβρίου 2014, για τη συλλογή ζωντανών οργανισμών πάνω σε μια λωρίδα μεταξιού και ωκεανογραφικών δεδομένων, μέσω ενός αισθητήρα που είναι δεμένος με το CPR.

Με την προώθηση μιας τέτοιας προοπτικής για χειρισμό του CPR, η ομάδα του ΙΚυ μέσα από το πρόγραμμα PERSEUS φιλοδοξεί να δώσει έμφαση στα κενά έρευνας που προκύπτουν για την θαλάσσια επιστήμη εντός της Μεσογείου. Στόχος του εργαστηρίου ήταν η ευαισθητοποίηση για μελλοντική τακτική προσπάθεια παρακολούθησης πλαγκτόν με τη χρήση του CPR τόσο στη λεκάνη της Μεσογείου όσο και στην Μαύρη Θάλασσα. Αυτό επιτυγχάνεται από τη δημιουργία του εργαστηρίου MedCPR, που στεγάζεται στο νεόδμητο Εργαστήριο Καινοτόμων Τεχνολογιών του ΙΚυ.

Στο Εκπαιδευτικό Εργαστήριο, συμμετείχαν επιστήμονες από 7 χώρες (12 ιδρύματα) και σκοπός τους ήταν να διερευνήσουν τρόπους για την επέκταση του MedCPR σε νέες περιοχές της Μεσογείου και της Μαύρης Θάλασσας. Οι συμμετέχοντες, που προέρχονταν από ακαδημαϊκά, ερευνητικά και κυβερνητικά ιδρύματα (π.χ. University of Salento, Lecce, Ιταλία, Institute of Fish Resources, Varna, Βουλγαρία, Oceanography Centre του Πανεπιστημίου Κύπρου, και Τμήμα Αλιείας και Θαλασσίων Ερευνών Κύπρου) έδειξαν ενδιαφέρον για την ίδρυση CPR στα ιδρύματά τους και την καθίδρυση του CPR στην περιοχή.

Στη διάρκεια του Εργαστηρίου οι συμμετέχοντες συμφώνησαν να εργαστούν για την επίτευξη ενός κοινού ερευνητικού προγράμματος σε ευρεία κλίμακα, το οποίο θα βασιστεί στην εμπειρία της Ομάδας Θαλάσσιας Επιστήμης του Ινστιτούτου Κύπρου.

Το τριήμερο Εργαστήριο περιελάμβανε επιδείξεις της μεθοδολογίας που ακολουθείται, παρουσιάσεις και εκδρομή με το δεξαμενόπλοιο PETROLINA OCEAN που ρυμουλκεί το CPR.

## Article featuring in online media

The following article featured on the webpage of the online newspaper "Filoksenos" on November 10, 2015. The article can be accessed through the following link: http://filoksenos.blogspot.com.cy/2015/11/blog-post_413.html


**Τρίτη, 10 Νοεμβρίου 2015**

### Έρευνα για την παρακολούθηση του πλαγκτόν και την υγεία των θαλασσών από την Ομάδα Θαλάσσιας Επιστήμης του ΙΚυ

Εργαστήριο για την καινοτόμο μέθοδο παρακολούθησης του πλαγκτόν στην Ανατολική Μεσόγειο διοργάνωσε η Ομάδα Θαλάσσιας Επιστήμης (MSG) του Ινστιτούτου Κύπρου (ΙΚυ), στο πλαίσιο του Ευρωπαϊκού προγράμματος PERSEUS.
Σκοπός της έρευνας, η οποία ξεκίνησε τον Οκτώβριο του 2014, είναι η συγκέντρωση πληροφοριών σχετικά με την Καλή Περιβαλλοντική Κατάσταση της θάλασσας της Μεσογείου και της Μαύρης Θάλασσας, ώστε να λειτουργήσει ως βάση για την ανίχνευση μελλοντικών αλλαγών.

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Παρά το γεγονός ότι οι προδιαγραφές και το πρωτόκολλο του CPR έχουν σχεδιαστεί σχεδόν έναν αιώνα πριν, με συνεχείς περισυλλογές δειγμάτων πλαγκτόν με το CPR στη Βόρεια Θάλασσα ξεκινώντας το 1931 κυρίως στον Ατλαντικό και τον Ειρηνικό Ωκεανό, ο στόχος είναι να προσαρμοστεί και να χρησιμοποιηθεί στην λεκάνη της Μεσογείου με πανομοιότυπο τρόπο. Αξίζει να σημειωθεί, ότι αυτή είναι η πρώτη φορά που το CPRχρησιμοποιείται στην Ανατολική Μεσόγειο, ενώ είναι πολύ σημαντικό το γεγονός ότι για πρώτη φορά διενεργείται τέτοια έρευνα σε μια Μεσογειακή χώρα.

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Το τριήμερο Εργαστήριο περιελάμβανε επιδείξεις της μεθοδολογίας που ακολουθείται, παρουσιάσεις και εκδρομή με το δεξαμενόπλοιο PETROLINA OCEAN που ρυμουλκεί το CPR.