

International Campus of Excellence of the Sea

Final Report 2011 - 2016

cei·mar



campus de excelencia internacional del mar

CEI-MAR coordination office
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Coordinating University: University of Cadiz

Participating Universities / Aggregation Promoters:

- ▶ University of Huelva
- ▶ University of Cádiz
- ▶ University of Málaga
- ▶ University of Granada
- ▶ University of Almería

Other promoters of CIE:

- ▶ University of Algarve (Portugal)
- ▶ University Abdelmalek Essaâdi (Marruecos)
- ▶ Spanish National Research Council (CSIC), centers: Andalusian Institute of Marine Science (IC-MAN-CSIC) and the Andalusian Institute of Earth Sciences (IACT-CSIC).
- ▶ Spanish Institute of Oceanography (IEO), centers: Oceanography Center of Cádiz, Oceanography Center of Málaga.
- ▶ Andalusian Institute for Research and Training in Agriculture, Fisheries, Foods and Organic Production (IFAPA pertaining to the Andalusian Regional Government's Council of Agriculture, Fisheries and Rural Development, centers: El Toruño (Cádiz), Agua del Pino (Huelva).
- ▶ Royal Naval Institute and Observatory (pertaining to the Ministry of Defence).
- ▶ The Naval Hydrographic Institute (pertaining to the Ministry of Defence).
- ▶ Underwater Archaeology Centre of the Andalusian Institute of Historic Heritage (CAS-IAPH), pertaining to the Andalusian Regional Government's Ministry of Education, Culture and Sport.
- ▶ National Museum of Underwater Archaeology (ARQUA), Ministry of Education, Culture and Sport.

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INDEX

Introduction	3
Summary of Work Accomplished	11
Project Management	23
Future Projections	29
Table I. Action programs at evaluable focus areas	57
A. Improving Teaching and Adapting to the European Higher Education Area	59
SECTION A.1. Enhancing teaching quality	61
SECTION A.2. Extending the range of international courses	93
SECTION A.3. Innovation in teaching	109
SECTION A.4. Physical adaptation of teaching spaces to the EHEA.....	113
SECTION A.5. EIDEMAR International Doctoral School in Marine Studies.....	117
SECTION A.6. Promoting international mobility	135
SECTION A.7. Language Training Programme	151
SECTION A.8. Partnership Network between universities, vocational training centres and companies.....	157
SECTION A.9. Continuing education for companies and institutions	161
B. Scientific and Knowledge Transfer Improvement.....	171
SECTION B.1. Research and transfer clusters	173
SECTION B.2. Plan for Advanced Research: Plan reSEArch.....	187
SECTION B.3. Enhancing the inter-relationship between Science, Technology and Business.....	203
SECTION B.4. CEIMAR Innovation Ecosystem: Boosting the Blue Economy	231
SECTION B.5. Scientific Outreach.....	243
SECTION B.6. University - Business - Society Connection Programme	257
SECTION B.7. CEI·MAR Infrastructure	267
SECTION B.8. Making laboratories sustainable	295
C. Campus Transformation for Development of an Integral Social Model	299
SECTION C.1. CEI·MAR Employability Plan	301
SECTION C.2. CEI·MAR Society Interaction Programme.....	313



SECTION C.3. Improving Sports Facilities	329
SECTION C.4. Universal Accessibility Plan	335
SECTION C.5. CEIMAR ICTs Programme	339
SECTION C.6. CEI·MAR Sustainability Programme	345
Table II. Main obtained results	351
Table III. Progress indicators.....	359
Table IV. Use of resources	363

Introduction



INTRODUCTION

The CEI·MAR background

In 2011, a closely connected group of universities (from Andalusia, Portugal and Morocco, all located around the Strait of Gibraltar), together with research institutions and companies, presented a scientific partnership project, aimed at rediscovering the sea with scientific excellence, innovation and connections to the productive sector and society in the Southern Iberian Peninsula. The sea is the definitive factor in the region's uniqueness: the geographic location itself (the southern Iberian Peninsula and the North of Morocco); its history and culture (the first human settlements in the area provide evidence of a convergence of civilisations made possible by the narrow stretch of water, the Strait of Gibraltar, meeting point for the Atlantic Ocean and the Mediterranean Sea); its international vocation (destination and origin of colonial routes and of the discoveries, from Phoenicia to Latin America); its economy and current development (a large part of its society's economic activity is related to the opportunities and limits which its environment implies); and its scientific, technical and industrial distinctiveness (a high level of specialisation in marine studies and research in these universities and a business sector with close ties to the sea, navigation and coastal tourism). The project that brings together all of this richness and diversity is called **CEI·MAR**.

The **CEI·MAR** project was presented to the Campus of International Excellence programme, an initiative of the Government of Spain whose main objective was to increase the quality of the Spanish university system. Campus specialisation should represent excellence in each project, so that each initiative can be differentiated and distinguished by the wealth of disciplines or themes that define it. The diversity of perspectives and subjects which were used to analyse, utilise and understand the marine environment described a complex Campus of Excellence, which raised the challenge, and in turn our commitment. **CEI·MAR** was founded on a comprehensive, multidisciplinary

and interdisciplinary analysis, integrating and involving academics, researchers, public institutions, social partners, leading industries in innovation and small and medium-sized companies (SMEs). Excellence should also be a channel for international recognition for new partnerships, called to improve the status of Spanish science in the international sphere. An aspiration that universities should take into account (a new system of inter-university cooperation) with the participation of other knowledge-based institutions (PRIs) and socio-economic stakeholders. **CEI·MAR** approaches internationalisation not only as an arena to compete in, but also as an opportunity to be enriched by the contributions of overseas students, teachers, researchers and institutions.

With these claims in mind, today **CEI·MAR** is the largest scientific and business partnership in Spain, one of the largest in the world. The harmonious integration of the sciences, engineering, health, social and legal sciences and humanities defines **CEI·MAR's** programmes, the only Campus of Excellence in Spain that addresses and integrates all marine knowledge; covering all marine-related academic, scientific and productive specialities as well as the sea's resources, uses and its sustainable exploitation. This knowledge is generated in **CEI·MAR** in an integrated manner, from a three-fold perspective: communication between the different branches of science; enabling analysis and more complex applications than those that result from a single perspective (*interdisciplinary*); and well-organised coordination between teaching, scientific, research, social and productive institutions to make the most of the joint effort (*interinstitutional*). **CEI·MAR** has not limited neither its expectations nor its action area to the geographical area where its main participants are located (Southern Spain, comprising of the Andalusian coastal provinces between the Atlantic and the Mediterranean). Since its origins, it has had an intense international component (the south of Portugal and the north of Morocco). **CEI·MAR**, taking for granted the fact that neither Science nor the Sea should limit hu-



man activity, on the contrary, promotes exchange worldwide, and has made its *international* nature a distinctive element in itself and in its programmes to spread the whole Campus of Excellence concept and activity and extend its results at the same time as recovering international cooperation.

In short, CEI-MAR has been shaped in a unique setting, singled out for its historical, oceanographic, strategic, biological, landscape, climatic, economic and social values. CEI-MAR has attempted to transform the classic university concept, exceeding the strictly academic model through the *Campus of International Excellence* model; transferring knowledge to companies, contributing to industrial development and innovation, economic development and job creation, mainly in Andalusia. CEI-MAR has achieved and consolidated its status as a national and international benchmark in the Campus of Excellence model.

CEI-MAR is made up of all the universities on the coast of Andalusia (Almeria UAL, Cadiz UCA, Granada UGR, Huelva UHU and Malaga UMA), the south of Portugal (the Algarve UAIG) and the north of Morocco (Abdelmalek Essaadi UAE). To these we can add leading institutions in marine-maritime research in Spain, (Spanish National Research Council CSIC through the Institute of Marine Sciences of Andalusia and the Andalusian Institute of Earth Sciences; Spanish Institute of Oceanography IEO through the coastal centres in Cadiz and Malaga; Andalusian Institute of Agricultural and Fisheries Research and Training IFAPA through the "El Toruño" and "Aguas del Pino" centres; the Royal Observatory of the Navy ROA; The Hydrography Institute of the Navy IHM; the Underwater Archaeology Centre CAS which reports to the Andalusian Institute of Historical Heritage IAPH; and the National Museum of Underwater Archaeology ARQUA) and companies that stand out for their use of marine knowledge and skills. Its key strength has been in associating this partnership and its common objective with the wealth of diversity and experience from different national and overseas institutions. In this way, CEI-MAR is as committed to the most innovative industries (shipbuilding and offshore,

transport and maritime logistics, etc.) as it is to more traditional industries (aquaculture, fishing, salt marsh exploitation, tourism, etc.) without leaving out new opportunities offered by emergent activities (seaweed cultivation, marine renewable energies, medical research, food technology, etc.). Marine knowledge, its technical application and social progress have always been a joint endeavour, working together to provide the best scenario and the most experienced specialists to transform the region. As a result, CEI-MAR is the Spanish Campus of Excellence with the highest number of universities (7), member participants (14) and countries (3); and it is enriched more every day with the contributions, practices and perspectives of all those who wish to collaborate with the partnership. One of the things that makes CEI-MAR unique is the geographic breadth of the campus (almost 1,200 km of coast in the south of the Iberian Peninsula and North Morocco), which results in a considerable physical distance between Campus associated centres. CEI-MAR has overcome the physical distance by creating teleconferencing rooms and virtual classrooms, which enable remote working, virtual training and the immediate exchange of information.

The CEI-MAR R+D+i strategy is fully consistent with the European strategies in the *European Union Horizon 2020 Research and Innovation Programme* (H2020) and in the specific *Blue Growth* strategy (*European Commission Directorate-General for Maritime Affairs and Fisheries*). CEI-MAR has taken on board the *Blue Economy's* claims, enhancing the *Platform for the Blue Economy*, made up of large companies, SMEs, business associations, port authorities and technological centres, under the leadership of CEI-MAR. An essential forum for institutional, social and business collaboration that identified areas of innovation opportunity and economic growth and reflected them in the *Regional Strategies for Research and Innovation for Smart Specialisation* (RIS3). Thus, CEI-MAR's strategy and participation are clearly set out in the *Strategy for Innovation Andalusia 2020 -RIS3 ANDALUSIA* - passed by the Andalusian Government, and for the Algarve (RIS3 ALGARVE).



CEI·MAR has become a key and high-priority asset for the development of its surrounding area as a result of the extraordinary scientific, technical, economic and social potential that is unified in its aims and converges in this Campus, putting all its skills at the service of business innovation, job creation and scientific dissemination. **CEI·MAR** emerges as a unique and qualified Science, Technology and Business partnership, an optimum forum which contributes to the work of enhancing economic activity, mainly in the south of Spain and Portugal and the north of Morocco.

The number and diversity of institutions engaged in **CEI·MAR** posed a challenge, although in the end, it has proved to be one of the Campus' greatest strengths. **CEI·MAR** embraces the agreed programme outline and benefits from each institution's scientific distinctiveness and particular features. Thus, the way of working together was made apparent with the establishment of the **CEI·MAR Foundation**, a legal concept with particular legal requirements, whose *Board of Trustees* sets the Campus guidelines. Implementing strategies and monitoring the Foundation's annual plan of programmes are entrusted to the *Executive Committee* and the *Managing Director*. The **CEI·MAR Foundation's** unique project is linked through six *inter-institutional committees*. Their mandated programmes are backed by the **CEI·MAR General Coordinator's** programme. The *Advisory Board* for the **EIDEMAR International Doctoral School in Marine Studies**, attends to Campus training (doctorates, masters, short courses, ongoing training, etc.), becoming the most specialised **CEI·MAR** entity where research and professional training converges with social dissemination. The resulting governance ensures an optimum way of integrating all Campus of Excellence institutions, their direct participation in defining and carrying out **CEI·MAR** activities and the attraction of their own researchers and those from other institutions.

CEI·MAR Project Objectives

The general objective which birthed **CEI·MAR** in 2011 was: "to bring Universities, Research Institu-

tes, Companies and Social Partners from the South of Spain and Portugal and the North of Morocco together around the Sea. It would be an inclusive campus which would become an international benchmark for Marine Science and Technology. It would work on establishing an academic, scientific, entrepreneurial and innovative high quality environment, enhancing excellent training and research in specialisation areas and transferring its knowledge and activities to society".

This general objective was set at the start of the **CEI·MAR** project in 23 action programmes which would refer to 3 strategic focus areas decided in the CEI gathering. (A) Improve teaching and adapt it to the European Higher Education Area; (B) Improve Science and Knowledge Transfer; (C) Transform the Campus to develop an inclusive social model and develop its interactions with its social, business and regional surroundings. In the last 5 years, **CEI·MAR** has carried out 23 action programmes. The timing and results are described later in the progress sections. The initial proposals were carried out successfully with an exceptionally high satisfactory rating. In some cases, this was far better than anticipated. The evolution of the project itself has meant that some of the initial objectives have needed to be reformulated, therefore adapting the activities to these new objectives. Those programmes modified in respect to the original project are described in the corresponding section.

2014 Progress Report: weaknesses and recommendations

The execution stage of the **CEI·MAR** project was evaluated by the International Commission in 2014, which awarded it the highest possible rating (grade A) for its progress attained. It also brought up weaknesses and recommendations for improvement that **CEI·MAR** has addressed, as described in more detail in the content sections. It highlighted the following programmes undertaken turning our attention to the evaluation's extremes.

1. *Increase collaboration and commitment of CEI·MAR members.* In terms of the project's ou-



networking, the involvement of the 14 member institutions has increased considerably, engaged in a joint project which makes us stronger. Some examples of this engagement are: (a) creation of **CEI·MAR** research and innovation groups where partner researchers, public administrations and companies have formed inter-agency collaborative work groups applicable to thematic interests (Living Marine Resources, Port Management and Transport Logistics, Shipbuilding and OffShore, Renewable Marine Energies, Health and the Sea, and Blue Tourism; Section B.1.), which converts **CEI·MAR** into a relevant intermediary for administrations and companies in the marine-maritime sector; (b) merge member research facilities, enabling access to 200 devices which make up the **CEI·MAR** central service of facilities and equipment of interest to research, available to the whole **CEI·MAR** partnership with the participation of various partnership members; (d) joint teaching activity, including offering specialised programmes and ongoing training, masters and doctoral programmes. This greater level of inclusion has been underpinned by defining and putting into place Campus governance structures: the **CEI·MAR** Foundation, establishing a **CEI·MAR** General Coordinator, the *Interinstitutional Committees* and the **EIDEMAR** Advisory Board.

2. Improving internationalisation. The *European Union Horizon 2020 Research and Innovation Programme* (H2020) and the specific *Blue Growth* strategy from the European Commission *Directorate-General for Maritime Affairs and Fisheries* set the reference framework for Campus R+D+i programmes. **CEI·MAR** has actively participated in networks, European meetings and in various H2020 public-private partnerships that it participates in. Since the last Campus evaluation, we have created the partnership's *Office for European Projects* and the **CEI·MAR** *Brussels Delegation* is fully functioning, a key element to support campus internationalisation. Regarding academic provision, **CEI·MAR** has consolidated its international thrust (doctoral programmes such as Erasmus Mundus; joint masters with universities such as Ferrara and the Hydrometeorological University of St. Peters-

burg). **CEI·MAR** has also strengthened relationships with some of the most prominent universities in North America (California, Massachusetts and Woods Hole Oceanographic Institution), Europe (Ferrara, Bretagne and Southampton) and Latin America (National Autonomous University of Mexico, Simón Bolívar of Colombia and Rio Grande do Sul in Brazil). **CEI·MAR** identifies, collaborates with, and maintains close relationships with international benchmark institutions with **CEI·MAR** *Quality Seals of Excellence* (National Autonomous University of Mexico and University of Ferrara). **CEI·MAR** has joined the consortium, **EUROMARINE**, which brings together the main marine research institutions in Europe and has strengthened relationships between research teams and Latin American governments in the **IBERMAR** network, integrated management of coastal areas and in the Postgraduate Iberoamerican University Association, AUIP, whose presidency is undertaken from the **CEI·MAR** coordinating university (sections A.2, B.2, B.4). The **CEI·MAR** Foundation has been recognised by the Erasmus+ K2 consortium, granting European mobility programmes Erasmus+ K103 (European) and Erasmus+ K107 (outside of Europe).

3. Attracting international students to EIDEMAR. The International Doctoral School has steadily increased the percentage of overseas students in its doctoral programmes and training activities, currently equating to more than 25% of the total, a process of attracting students that will continue in the future. It is worth highlighting the Marine Science and Technology doctoral programme which is taught together with Ferrara. It is also worth highlighting the inclusion in the Erasmus Mundus programme, "Marine Coastal Management" (MACOMA) to **EIDEMAR**, along with other European universities (Cadiz, Algarve, Aveiro, Bologna) and the University of St. Petersburg. Finally, we would like to highlight the funding of overseas stays for **EIDEMAR** students (predoctoral contracts). With regards to Latin America, an advanced doctoral training programme has been designed with universities in Ecuador and Colombia for **EIDEMAR** doctoral students; as well, an agreement has been signed with the Government of Argentina



(BEC.AR programme) which addresses *Grants for Short Specialisation Course in Marine Sciences– CEI-MAR/EIDEMAR-* for Argentine professionals (sections A.2, A.5, A.6).

4. Postdoctoral Contracts. In addition to 36 pre-doctoral contracts funded by CEI-MAR, 25 post-doctorates have been contracted in CEI-MAR institutions over the last evaluation period. Directly funded by CEI-MAR, 7 postdoctoral contracts have been offered and granted. Furthermore, 18 doctoral contracts have been granted in competitive contests which include the “Ramón y Cajal”, “Juan de la Cierva” and “Talent Hub”. The latest contest is run by the Andalusian Regional Government to attract talent and all recipient institutions must belong to a Campus of Excellence (Section B.2.)

5. Investing in improving research facilities. The work carried out over the last two years has enabled this point to go from being classed as a weakness, to one of the Campus’ greatest strengths. Through applying for external funding, co-financed by CEI-MAR, we have obtained 9.5 M€ in scientific infrastructure, with another 7 M€ more pledged for the next few months. Among the facilities acquired (Section B.7.) we would like to highlight: (1) the launch of the UCADIZ oceanographic vessel, including its refurbishment and oceanographic equipment; (2) renovation (already started) of the *Business Transfer Centre CTE* building, 4,750 m² which will incorporate technologically advanced facilities and services providing interesting opportunities for innovative companies in our area; (3) other facilities: the Aquaculture plant, a navigation and an engine simulators, putting in place laboratories for research and/or marine dissemination (Marine Research Laboratory –LABIMAR-, the Marine Classroom (“Aula del mar”), Photobiology laboratory or the Advanced Primary Production laboratory (Section B.7.). As well, infrastructure endowment to the Institute for Research and Innovation in Biomedical Sciences in the Cadiz Province (INiBICA) and to the University of Cadiz Research Institute of Social and Sustainable Development (INDESS).

6. Improving relationships with companies, transferring research outcomes. CEI-MAR has enhanced

the inter-relationship between Science, Technology and Business, carrying out several programmes to build relationships of trust with several companies (national and international business clusters, Platform for the Blue Economy, a multitude of meetings, workshops and meetings etc.) The inclusion of large companies onto the Foundation's Board and the participation of SMEs through the Andalucía Confederation of Entrepreneurs helps deepen and consolidate close relationships with companies at the same time as attaining economic funds to underpin improvement programmes. CEI-MAR has also enhanced the register of patents and the creation of up to 17 *Spin off* companies. This improvement has allowed us to consider a marine-maritime Innovation Ecosystem (Section B.3.).

7. Attracting external funding. Since the last evaluation, external funding has increased, mostly private, through three main mechanisms: (1) companies included in the CEI-MAR Foundation as new trustees who are in charge of action programmes; (2) companies who co-finance industrial predoctoral contracts; (3) contracts with companies, many of whom participate as CEI-MAR members. In this period, 1,502 contracts with companies have been signed, equating to an overall amount of close to 51 M€. Public funding has also been granted through: (1) carrying out national and European projects; (2) facility grant schemes, through which we have obtained 16.5M€ by applying for subsidies and special funds for innovation from regional development funds (FEDER) (Sections B, especially B.2, B.3 and B.4).

This brief outline is explained in more depth in subsequent progress sections. After 5 years of collaborative work in CEI-MAR, the member institutions, companies, administrations, social partners and society as a whole perceive CEI-MAR as an essential asset which propels us to higher levels of excellence and internationalisation, giving us an authoritative voice in problem-solving today and in forward planning for future problems. Connected to each other, connected to the world thank to XXI century new technologies, we can revalidate our CEI-MAR slogan: *the sea that unites us.*

Summary of Work Accomplished



SUMMARY OF WORK ACCOMPLISHED

The main objective of the “International Campus of Excellence” programme was to improve the quality of the Spanish university system. This improvement was to be demonstrated by achieving objectives of excellence that allowed each campus to be defined and distinguished by its specialisation in certain disciplines or areas. At the same time, excellence was to be an opportunity for international recognition for the new partnerships, improving how the status of Science in Spain is perceived by the international scientific community. An academically ambitious task, that was not to be assumed by each university alone, but in the company of other universities (an interuniversity collaboration and specialisation system, that would join initiatives and opportunities) and through partnerships with other knowledge-based institutions and research bodies (PRIs), together with socioeconomic agents.

Five years later, CEI-MAR is today a reality. It is a scientific and business partnership dedicated to teaching, research, innovation and knowledge transfer that has extensive resources and infrastructures, a leader in its field of specialisation in Spain. Its activity is projected on all specialities surrounding marine knowledge, its resources, its use, and its management and sustainable exploitation, from all of perspectives provided by science. CEI-MAR generates and exploits the knowledge produced in a coordinated way, integrating an interdisciplinary perspective from each subject (a well-organized confluence of subjects and branches of knowledge) with the participation of teaching, scientific, research, social and productive institutions that jointly guarantee the best results (thanks to the specialisation and experience that each protagonist provides). CEI-MAR takes as a first reference point for its activity the geographical framework in which its European partners are located (the south of the Iberian peninsula, with its five coastal Andalusian universities together with the Portuguese university), to which must be added the most distinguished university of the north of Morocco. The CEI-MAR region is the epicentre of cultures and legends, essential to the circulation of

people and contact between nations. Thus, being an intrinsic part of the Campus, CEI-MAR is conceived with an international nature, meaning that Science and the Sea offer unique opportunities for the universal exchange of ideas, knowledge and commitment to development.

This prior generic approach, summed up by tens of programmes, executed in hundreds of activities, projected on thousands of teachers, students, researchers, professionals and businesses has made CEI-MAR an indispensable protagonist in teaching, development, innovation and growth in its field and a reference point in marine-maritime knowledge. This role is solidly founded in the extraordinary progress made by CEI-MAR in research and knowledge transfer, also dealing preferentially with its conception, development and international application.

The definition and effectiveness of the CEI-MAR system of governance has permitted the consolidation of the International Campus of Excellence. The constitution of the CEI-MAR Foundation, an embodiment of the institutions' firm commitment to the Campus, has enabled the boosting and coordination of inter-institutional activities, executed under the coordination of the *inter-institutional commissions in different subject areas* (Teaching, Internationalisation, Infrastructures, Research and Knowledge Transfer, and Communication), acting under the supervision of the *General Coordinator of the Campus*. The position of *Foundation Director*, together with the *Foundation Board* and, on occasion, its *Executive Committee*, complete the system of governance of the Campus. The legal form of a foundation is useful because of the security that its regulated form of activity provides. In addition, it contemplates the eventual incorporation to the CEI-MAR project of other bodies participating in research, knowledge transfer and innovation in the CEI-MAR fields; which has enabled Spanish businesses with a strong international presence and leaders in their industrial and business fields, to join CEI-MAR (CEPSA, Telefónica, Banco Santander, ENDESA and the Andalusian Confederation



of Entrepreneurs, representing the small and medium-sized enterprises –SMEs- of the sector).

a) Improving Teaching and Adapting to the European Higher Education Area

Under this heading, CEI-MAR has drawn up its teaching strategy defining a range of courses internationally recognised for their quality and praised for their specialisation. The range of courses that CEI-MAR offers has been designed with the highest assurances of quality and responds to the excellence required for the creation of the Campus. The commitment of the CEI-MAR institutions to the consolidation of this International Campus of Excellence has meant a review of the initial range of courses in the light of the indicators and the opportunities of CEI-MAR. At the same time that the *formal objectives* of the partnership have been met (the adaptation of the courses to the teaching requirements of the European Higher Education Area, the integration of the ICTs in the teaching activities of the institutions, meeting the quality standards of the assessing bodies in the courses, etc.), the *academic objectives* have also been successfully achieved, those related to the harmonic integration of the range of CEI-MAR courses, an offer that brings together the potential of all the institutions belonging to the partnership, providing a different and complementary teaching and training profile that covers the relevant fields of knowledge, the arts and those professions linked to the marine-maritime world.

Since its conception, CEI-MAR has been characterised by its vocation to project itself beyond the strict geographical field that defines its actions and achieve international scope. CEI-MAR has participated in the consolidation of national networks (CEIMARNET) and international ones (IBERMAR, EUROMARINE). Each of them has benefited from the participation of CEI-MAR and at the same time, has enriched the horizons of the Campus of Excellence, making it truly international. In all of these cases, CEI-MAR has advertised its own range of courses in different places, reaching strategic agreements with Universities and foreign governments and consolidating important relationships with prestigious international institutions.

CEI-MAR delivers outstanding, high-quality teaching, projected over complete courses, university ones in the strictest sense (Degree, Masters' and Doctorate studies) or not (ongoing training, specialisation courses, social and dissemination activities, seasonal courses, etc.). A range of courses that responds to all academic or business training needs, required by the social, productive and innovative sectors of the CEI-MAR area. A specific range of courses has been designed for the International Campus of Excellence, which will meet the training needs, including those of research and innovation, of Universities, institutions, businesses and society. All of this from an international perspective, delivering training adapted to the requirements of foreign Universities and research institutions and, also the global strategies of the governments of other countries.



EIDEMAR prioritized the specialization and internationalization of marine-maritime studies. In the images, the doctorate student F. Moreno working in a lab at the University of Roskilde (Denmark, left); field activities during the International Summer School CEI-MAR (centre); CEI-MAR representatives providing a specialized course in Galapagos Islands (Ecuador)



The most noteworthy milestone in the field of teaching is the creation of the *International Doctorate School of Marine Studies*, **EIDEMAR**, which has meant a significant advance towards the collaborative work of the **CEI-MAR** institutions, through doctoral training. It is a centre qualified by its objectives (postgraduate training, masters' and doctorate degrees; also permanent training), by its origins (bringing together national and foreign universities; making it a truly international centre) and by the functions it assumes: **EIDEMAR** organises activities involving teaching, research, collaboration with businesses that require the participation of researchers and innovation, in addition to the specialisation and dissemination activities carried out by **CEI-MAR**, both nationally and internationally.

Since its constitution, **EIDEMAR** has played a leading role in doctoral training on the Campus of Excellence, through four Doctorate Programmes, which cover all the lines of research and knowledge transfer of excellence of the research teams from the **CEI-MAR** institutions: (1) *Marine Science and Technology*; (2) *Marine Resources*; (3) *Management and Conservation of the Sea*; (4) *Maritime History and Archaeology*. The doctorate programmes have a marked international character, thanks to both the researchers tutoring the doctoral training, the mobility offered to trainee researchers and the capacity to attract specialised talent to its classrooms and laboratories. The **EIDEMAR** internationalisation perspective is designed with a focus on Europe, as can be appreciated in the *Erasmus Mundus Doctorate Programme* (5) "*Marine and Coastal Management, MACOMA*".

The **EIDEMAR** academic offer is, undoubtedly, attractive (Section A.5); and is continually growing, meeting the training needs that arise. The number of trainee researchers that are doing doctorate studies in the School has exceeded 100% of the places offered since the creation of the school. Two hundred students (access to the doctorate programmes is competitive), of which 20% are trainee researchers from other countries, share training in the numerous **EIDEMAR** activities that bring together students from different disciplines and nationalities. The **EIDEMAR** training and specialisation activities, which doctoral training is a

part of, are numerous (see the **CEI-MAR** website and Section A.1). The number of doctoral theses prepared, all with top grades and many with a European or international recognition, continues to grow (Section A.5).

The *agenda* of doctoral training activities is projected abroad, particularly, through the *International Summer School*. The ISS offers specialised international training modules, courses of international excellence, cultural activities, sports, language courses and other programmes for the public; being an agent to attract international talent to **EIDEMAR**. The activities of the *International Summer School* are set up in a multi-campus format, with teaching programmed and delivered always in English, and with the collaboration of prestigious international experts from the United States of America, France, Holland, Italy, Portugal and Germany. In addition, under the patronage of the ISS, courses are run in places far away from the physical area of **CEI-MAR** of great environmental and symbolic value, like the *Applied Oceanography and Integrated Management of Coastal Areas in the Galapagos Islands* course delivered in the Galapagos Islands (Ecuador), thanks to an agreement between **CEI-MAR** and the Oceanography Institute of Ecuador (**INOCAR**).

The official degrees and Masters' Degrees related to **CEI-MAR** marine topics are enriched with postgraduate students and students from the training activities and specialisation courses taught from the International Campus of Excellence, an intermediary step towards **EIDEMAR** doctorate studies. **CEI-MAR** is designing new, highly specialised official Masters' Degrees. In the last year, **EIDEMAR** has added to its range of courses the *Masters' Degree in Nautical and Underwater Archaeology*, a strategic line of **CEI-MAR**, that directly connects us with other foreign universities of international prestige (such as the National Autonomous University of Mexico, UNAM). The course benefits from the collaboration of specialists and professionals from various institutions involved in protecting underwater archaeological heritage, and will cover an academic void in Spain. Together with the Masters' Degrees in Oceanography, Integrated Management of Coastal Areas, Maritime Transport,



Oceanic and Naval Engineering, Maritime History, Archaeology and Heritage, the Erasmus Mundus in Water and Coastal Management, Aquaculture and Fishing, Conservation and Management of the Environment, Civil Engineering (Roads, Canals and Ports) and Renewable Energies and Energy Efficiency, among others of a broader disciplinary nature (from Tourism to Environmental Education, including legal and economic disciplines), covering the broad spectrum of marine-maritime disciplines (Section A.1).

CEI-MAR uses its capacity and its prestige to consolidate inter-university alliances created with the Spanish campuses specialised in marine subjects, the **CEIMARNET** network. **CEI-MAR** presides over the **CEIMARNET** network, as well as presiding over the network's Work Group on Interuniversity Masters' Degrees, and has promoted the *Masters' Degree in Oceanography from the Universities of Cadiz, las Palmas de Gran Canaria and Vigo*, belonging to the three Campuses of Excellence (*CEI do Mar*, *CEI Canarias Atlántico-Tricontinental* and **CEI-MAR**), with the participation of the most relevant research institutions (the Spanish Oceanography Institute, IEO; and the Spanish National Research Council, CSIC). **CEI-MAR** promotes 3 similar interuniversity Masters' Degree initiatives within the framework of **CEIMARNET**: a *Masters' Degree in Fishing Management*, a *Masters' Degree in Integrated Management of Coastal Areas* and a *Masters' Degree in Underwater Technology*.

CEI-MAR is strongly committed to the internationalisation of teaching and through it, to international mobility programmes. **CEI-MAR** promotes international collaborations with North American research institutions; among others, with the University of Massachusetts Boston (UMass Boston), a participant in the specialisation courses of the **CEI-MAR International Summer School**. In addition, it has consolidated relationships with other prestigious North American institutions, among others, the University of Southern California, the University Villanova of Philadelphia, DePaul University in Chicago and WHOI (Woods Hole Oceanographic Institution).

In the framework of this strategy, **CEI-MAR** is driving the double international degree courses, espe-

cially that of the *Masters' Degree in the Integrated Management of Coastal Areas (GIAL)* and the *Laurea Magistrale in Scienze Geologiche, Georisorse e Territorio*, of the University of Ferrara (University awarded the **CEI-MAR** Seal of Excellence). In the same line, there is a *Masters' Degree in Oceanography* and a *Masters' Degree in Coastal Management* with the Univ. Cádiz and the Russian State Meteorology University of San Petersburg. With respect to Europe, the benchmark is undoubtedly the *Masters' Degree in Erasmus Mundus Water and Coastal Management*, WACOMA. Internationalisation is also directly focused on research (doctoral) training: **EIDEMAR** shares the *Marine Science and Technology* Doctorate Programme with the University of Ferrara. Other wider **CEI-MAR** European initiatives have involved the Campus joining **EURO-MARINE**, a consortium that groups together all the major European Marine Research institutions, and whose objectives include the consolidation of relationships between Doctorate Schools in Europe.

In Latin America, one of the strengths of **CEI-MAR** (recognised as such by the previous assessing commission) is the consolidation of the **IBERMAR** network of *Integrated Coastal Management*. This network, coordinated by researchers from **CEI-MAR**, brings together Latin American Universities and research centres working in the area of integrated management of coastal areas. **CEI-MAR** has been selected by foreign governments to run high-level training activities in their countries. We must also note that the governments of Colombia and Ecuador have entrusted **CEI-MAR** to run a *Training Programme for Marine Science doctorates* (Quito, Ecuador), to select Latin American researchers to carry out their doctoral theses in **CEI-MAR**. In this programme the University Simón Bolívar (Colombia), the University Eloy Alfaro (Manadí, Ecuador) and the Latin American University Postgraduate Association, AUIP (that **CEI-MAR** also presides over) participate. It is also important to note the young researchers being sent to study at **EIDEMAR** by the Argentine government, whose Ministry of Modernisation runs the BEC.AR (Section A.2) programme, with the collaboration of the SEPIE (Spanish Service for the Internationalisation of Education of the Ministry of Education, Culture



and Sports of the Spanish Government) and other Argentine institutions (such as the CONICET). It includes, among others, *Grants for Short Specialisation Courses in Marine Science in the University of Cadiz –CEI-MAR/EIDEMAR-*, directed at professional Argentines who wish to follow highly-specialised and doctorate level courses in **EIDEMAR**. It is also important to note the agreements with the Oceanographic Institute of the Ecuadorian Navy to train teams of officials in the masters' degrees and doctorates in **CEI-MAR** subjects, which also allows **CEI-MAR** to access the unique resources of the Ecuadorian Navy (and thus, access to its oceanographic programmes, and its bases on the Galapagos Islands, etc.).

The internationalisation work of **CEI-MAR** has been recognised by the *Erasmus+ K2 Consortium*, a European project for international mobility (of students, teachers and researchers; and also university administrators), that funds our marine studies; resulting in the **CEI-MAR** Foundation, that has managed mobility for all of the members of the partnership jointly, and is one of the European institutions that has obtained the most funding and number of places granted. The European mobility scheme (Erasmus+ K103) has processed 97 places in 2105-2016 for **CEI-MAR**, and for 2017-2018 a total of 117 places, for degree and doctorate students. In relation to grant schemes for countries from outside the Erasmus region, (Erasmus+ K107), **CEI-MAR** presented proposals to the ENI-SUR (*European Instrument of Vicinity with the South Mediterranean*) and the DCI-ALC (*Instrument for Development and International Cooperation with Latin America*) schemes, resulting in processing 124 mobility places for the years, 2015 and 2016.

B) Science and Knowledge Transfer Improvement

The European lines of interest relative to research and innovation in the marine-maritime field, both within the **European Union H2020 Research and Innovation Programme** and the specific **Blue Growth** strategy from the European Commission's Directorate-General for Maritime Affairs and Fisheries, make up the reference framework for our programmes and our R+D+i. Although **CEI-MAR** is already

an irreplaceable agent in generating economic activity and employment, in order to continue carrying out that role it must ensure international exposure in the field of innovation.

From this perspective, we have acted on both the international scene and in the geographical transnational field of influence of the Campus, organizing meetings and collaborations between the major players (large businesses, SMEs, technology centres, public administrations, financial institutions, technology platforms, innovative business associations, port authorities and **CEI-MAR**) of the economy in the marine-maritime field. **CEI-MAR** has also joined several large H2020 initiatives: the JTI *Bio-based Industries* (BBI) and the PPPs *Sustainable Process Industry* (SPIRE) and *Factories of the Future* (FoF). **CEI-MAR** is part of the business association *Vessels for the Future* (VftF) and is collaborating in the creation of the PPP *Blue Growth* initiative.

In spite of the recession, **CEI-MAR** has managed to involve businesses in its project and obtain resources from them, which has allowed us to develop internal research, knowledge transfer and innovation support programmes that back up the science and knowledge transfer improvement programmes. There are large programmes, coinciding with the 8 activity programs in which we have divided this section of Science and Transfer improvement (B.1 to B.8). This programs make up an integrated integral plan to increasing excellence and the internationalisation of the Campus's research and knowledge transfer, thus responding to society's challenges, favouring socioeconomic progress, the creation of jobs and regional development. The programmes carried out have contributed notably to the improvements in production and scientific quality of **CEI-MAR**, placing the Campus among the most important European and international organizations in the marine-maritime field.

In terms of the improvement of internationalisation, it is important to highlight the following: (1) the creation of an International Projects Office, with six dedicated workers; (2) the creation of a *Delegation in Brussels*; (3) joining several **H2020** public-private partnerships previously mentioned; (4)



CEI-MAR has carried out an intense scientific activity with results published in top scientific journals (left); provides unique infrastructures as the UCADIZ research vessel (centre), and is the leader of the Blue Economy platform in Andalucía (right)

supporting the mobility of researchers to centres of international excellence. The results obtained, in terms of the number of international projects and the thousands of joint articles with researchers from foreign institutions, are proof of the notable improvement in internationalisation of the Campus. As far as **European projects** are concerned, since 2012, 63 have been obtained, with 48 currently underway, which means a considerable increase since the beginnings of the Campus. Regarding articles indexed in the *Journal Citation Reports* (JCR), we have gone from 754 articles in 2011 (512 in the first quartile), to 1,060 articles in 2015 (885 in the first quartile), which are **increases of 40.6% and 72.8% respectively**. It is also important to note the programmes focussed on: (1) promoting research through the pre-doctoral contract programme (23 contracts to carry out doctoral theses in **EIDEMAR**); (2) the attraction of research talent to develop new lines of research or reinforce those already in existence (36 post-doctoral researchers), funded or cofounded by **CEI-MAR**. The number of national projects obtained has increased progressively since the start of the activities of the Campus, going from 155 obtained at the start of the partnership, to 402 in the last year. All of these indicators confirm that **CEI-MAR** has consolidated and reinforced its level of research excellence (sections B2 and B5).

Another fundamental programme has been the creation of a **research infrastructure network**, through which over 200 large infrastructures are coordinated, jointly valued in hundreds of millions of euros at the service of the partnership. In addition, important investment has been made in new infrastructures, by applying to competitive funding

schemes in which we have achieved **funding for scientific infrastructures of just over 9.5 M€ with another 7 M€ pledged**. A lot of equipment has been acquired, as well as the creation and improvement of laboratories (Section B7). We must also highlight, due to its singularity as a piece of equipment and because it has meant an important qualitative leap in the activities of our members and collaborators, the **oceanographic vessel UCADIZ**, which will support cutting-edge marine research, and on which the work to renovate it and provide it with scientific equipment involved an investment of over 2 M €. Thanks to this ownership, the vessel is completely devoted to Campus activities, which makes **CEI-MAR** the only Campus of Excellence in Spain that has an oceanographic vessel (it is also the only vessel of these characteristics based at an Andalusian port). Because of its importance in carrying out research focussed on the innovation needs of businesses it is important to note the funding obtained for the **Business Transfer Centre**, the construction process of which is currently underway (sections B.4 and B.7). The use of this facility by the international scientific community is backed up by the *existence of a network of Marine Research Institutes*, which forms a backbone for the whole of the **CEI-MAR** region, as it has centres along the coast covering all marine topics.

CEI-MAR is much more than the sum of its parts: the synergies created have permitted the confluence and interaction of research groups in different disciplines and from different institutions, promoting joint initiatives in projects requiring a multidisciplinary approach. Thus, **CEI-MAR** has brought together a large number of experts in marine



topics, multiplying the research and knowledge transfer capacity of the partnership and increasing its international competitiveness. In this sense, an important milestone has been the creation of six large **research and innovation associations**, linked to the following subject areas of the Blue Economy (economy based on activities linked to the sea): *Living Marine Resources, Port Management and Transport Logistics, Shipbuilding and Off Shore Industry, Renewable Marine Energies, Health and the Sea, and Blue Tourism*. These Associations, in collaboration with businesses, work on lines of research and innovation that are useful for territorial development.

In the field of knowledge transfer, CEI-MAR has become a powerful agent for the transformation of the knowledge-based productive model. CEI-MAR promotes, drives and supports innovation and sustainable growth in marine-maritime sectors, development of the economy based on activities linked to the sea, the well-being of society and territorial development. CEI-MAR has continuously supported the **inter-relationship between Science, Technology and Business**, through different types of programmes, with marked prominence and leadership. The creation of the *Platform for the Blue Economy* has been particularly significant, made up of business associations, large businesses, SMEs, technology centres and port authorities, under the leadership of CEI-MAR (Section B.4). Another significant milestone has been the *incorporation to the CEI-MAR Foundation board* of important businesses and business associations that, as a contribution to their membership, propose concrete R+D+i lines to develop with CEI-MAR researchers, being SMEs represented by the presence of the Andalusian Confederation of Entrepreneurs (CEA). This involves the consolidation of close collaboration links and future prospects. We must also highlight the creation of the *Naval Maritime Cluster*, whose immediate objectives include boosting advanced production of the vessel's construction process (Section B1) in which CEI-MAR was the driving force and heads the Innovation Committee on the Board of Directors. Another initiative key in enhancement efforts has been the *Industrial Doctoral Thesis Programme*, cofounded by businesses, that

has opened new R+i lines developed in collaboration with the businesses themselves and has a strong projected future (Section B.3).

The *Internal Programme for Business Innovation and Regional Development Projects* has been set up, through which CEI-MAR promotes and supports the cooperation of the partnership in business innovation projects. Three more fundamental milestones have been: (1) the start of the construction of the *Business Transfer Centre*, mentioned above, for CEI-MAR to provide services and carry out research oriented towards the innovation needs of the marine-maritime and shipbuilding productive sector; (2) the creation of an *Advanced Production Centre* for the shipbuilding industry that CEI-MAR participates in; (3) boosting entrepreneurship and the creation of innovative TBCs, with 17 new *Spin Offs* having been constituted over the life span of the Campus, which represents a substantial increase in less than five years. These are extraordinary results in which the CEI-MAR programmes to boost and support entrepreneurship and the creation of an Entrepreneurial Ecosystem linked to innovation, have been fundamental.

The confluence of the strategic lines developed has allowed the integration of all of the major players via the **creation of a marine-maritime Innovation Ecosystem**, focusing on innovation and growth possibilities of all that related to the marine economy on an international level. And as a result of this, **28 European projects in international consortiums with businesses** have been run, in addition to 1,502 contracts with businesses (for a total amount of around 51 M€, which means an increase of 71.8 % with respect to 2011) and, overall, CEI-MAR has made significant advances in the concept of knowledge transfer, promoting and undertaking innovation projects conceived in response to the challenges of businesses, and developed in mixed and multidisciplinary groups of researchers from the partnership and R+D+i personnel from the businesses.

The coincidence in time of the CEI-MAR initiatives with the definition of the RIS3 ALGARVE and RIS3 ANDALUCÍA (*Research and Innovation Strategy for Smart Specialisation*, RIS3, that regulates in-



vestment of EU cohesion policy for the 2014-2020 period, approved by the Council of the European Union in December 2013), created favourable conditions to make significant steps to determine opportunities for growth in the marine-maritime sectors of the economy and to generate places of trust among the participants of innovation. The proposals for the work carried out by the *Platform for the Blue Economy* were included in the official documents of the RIS3 ANDALUCÍA and of the RIS3 ALGARVE, with innovation being included in these economic sectors within the *Regional Strategies for Smart Specialisation* of both regions in the south of Europe, which guarantees that marine-maritime innovation projects can apply to competitive funding programmes with European social cohesion funding. In both innovation strategies **CEI-MAR** is expressly recognised as a *fundamental benchmark for innovation*.

The work of **CEI-MAR** has received national and international recognition, for its contribution to research and innovation in the marine and maritime fields. Proof of this is the trust placed in **CEI-MAR** by the *DG Mare* of the EC to be the local organizer, together with the Support Team of the Atlantic Action Plan, of the 2nd *Somos Atlánticos Workshop*, with the support of the Presidency and of the Ministry of Economy and Knowledge of the Andalusian Regional Government. With 189 participants it was the event that attracted the highest number of attendees out of the 10 national events already organized by the Assistance Mechanism in European Atlantic countries.

C) Campus transformation for the development of an integrated social model

The third strategic area of the Campus of Excellence, "*Transformation of the campus for the development of an integrated social model and its interaction with the social, business and regional environment*" is, undoubtedly, the *raison d'être* of **CEI-MAR**. The programmes from the first and second strategic areas of the project start to make full sense when they are projected on the socio-economic development of the region and the

raising of social awareness. All of the programmes run by **CEI-MAR** propose a future of improvement to the socio-economic situation of the region that, finally, must result in an improvement in working conditions. In this sense, an important area of action in society is boosting innovation through the enhancing the inter-relationship between Science, Technology and Business, the Innovation Ecosystem and the creation of an Entrepreneurial Ecosystem, in the marine-maritime field. These programmes have had great social impact, turning **CEI-MAR** into an essential instrument for the development of the marine-maritime economy and a benchmark for social and regional stimulus.

CEI-MAR has transformed the concept of a university in terms of teaching, research, innovation and knowledge transfer. The partnership has permitted greater projection of knowledge in different fields, from a purely academic one to its dissemination in society. Research and innovation have been enhanced thanks to a large number of researchers from different fields, who have established strong relationships with each other. In addition, the involvement of the productive sector has caused a synergic effect as far as new opportunities for collaboration are concerned, which has meant an improvement in knowledge transfer to society.

Promoting employability is a priority objective of **CEI-MAR**. In order to do this, programmes have been run to inform and advise Degree, Masters' and Doctorate students and graduates about employment in the marine-maritime field. Likewise, a large number of sector-specific meetings have been organized with companies, technology centres and administrations, with the aim of boosting relationships and bringing students and graduates closer to these institutions. A favourable atmosphere has been created for agreements for Degree and Masters' students to do work experience and write industrial theses, as well as the development of several business innovation projects of great social impact (Section B.3), with the aim of improving employability. In this sense, the **EMPLEAMAR** project has been drawn up, together with the rest of the marine campuses of excellence linked to the **CEIMARNET** network. **CEI-MAR** has contributed to the transformation of its environment, improving



The Marine Research Laboratory (LABIMAR) strengthened an intense agenda, with teaching, research and outreach activities. In the image, the CEI-MAR Scientific Summer Campus

the qualifications of personnel working in industry in the marine-maritime sectors, detecting innovation opportunities for businesses, running research applied to social and entrepreneurial change and contributing to all this with the creation of high quality employment (Section C.1); in this line, the commitment to the *Business Transfer Centre CTE* is solid for business innovation and, connected to it, employment in the marine-maritime field.

The role of CEI-MAR as a social transformation agent is reflected by the awarding of a series of prizes that highlight its role as an entity transforming social reality. To mention just two, the award for the best innovation initiative from the Andalusia Agriculture and Fishing Awards 2014 in the fishing section and the Award for Research, Innovation, Development and Business given by the Andalusian Academy of Environmental and Social Sciences.

CEI-MAR is also committed to the dissemination of marine knowledge to society. We have ensured that the Universities and PRIs transmit science and marine knowledge to the public and that their work, their potential and their values are transmitted to society. This change in mentality has moved in parallel to the strengthening of the dissemination of scientific culture in our country, a process in which the creation and consolidation of the Scientific Culture and Innovation Units (UCC+i) has been important, units that are present in most CEI-MAR institutions and that have obtained various strengthening projects to run programmes, among which the CEI-MAR scientific summer campus stands out, funded by the FECyT (Section C.2).

CEI-MAR dissemination activities have been very well received by a variety of public: school children, university students, associations (for example, fishermen's guilds, diving clubs, and neighbourhood associations) and the general public. The activities developed have included events with high impact and repercussion, as well as other longer lasting dissemination programmes for small groups. As an example of this, all of the CEI-MAR institutions have participated in the "Researchers' Night" (initiative funded by the European Commission which is held every autumn) and two editions of the "Marine Science Fair", that brought together over 5.000 people taking part in scientific activities and workshops. Recently, as the culmination of CEI-MAR project, there was outstanding participation in "The Tall Ship Race Cádiz-2016", with an enormous turnout of the public and great impact in the press.

CEI-MAR is committed to creating laboratories and facilities aimed at scientific dissemination, like the Marine Research Laboratory (LABIMAR) in Cadiz, the Marine Classroom ("Aula del Mar") in Granada, the La Esperanza Saltworks in Cadiz or the Strait of Gibraltar Environmental Observatory (OMEG) in Malaga. These centres have enabled a continuous labour of scientific dissemination and of making society aware of their values, through running different activities: public outreach conferences, workshops and social awareness programmes, or school visit programmes. Laboratories like LABIMAR or the "Aula del Mar" are, therefore, platforms for citizen science and volunteering, as both are benchmark centres of the *Observers of the Sea* project for the Atlantic ocean and the Andalusian Mediterranean sea coasts. The existence of the OMEG allows free and universal access to relevant scientific information in a unique part of the planet, the Strait of Gibraltar, a place where seas and continents meet, of great scientific, historical and social importance.

Dissemination has also been carried out through travelling exhibitions, such as the "Malaspina: A sea of data" exhibition, that has shown the main results of the "Malaspina 2010 Circumnavigation Expedition" project in the five capitals with CEI-MAR universities. This is one of the most important oceanographic research projects of the 21st Cen-



ture, in which several teams from the partnership participated. In addition, other educational exhibitions have been held to bring science closer to society in an approachable way.

CEI-MAR has virtual dissemination platforms, the most important being its new website (<http://www.campusdelmar.com>), universal digital media that has become the main means for CEI-MAR to connect with the public (Section C.5). Many of the programmes carried out have generated videos that are stored on universally accessed servers such as the CEI-MAR YouTube channel, where the audio-visual contents generated by the Campus can be seen. The photograph gallery is stored on a specific CEI-MAR Flickr page. The third means has been social networks, both Facebook and Twitter, updated in real time, and which have a high number of followers and enable a close relationship with great interaction. Finally, it is important to note the frequent relationship with citizens via the traditional media (press, radio, TV), who have remained highly interested in the evolution of the CEI-MAR project and have had important involvement in the events organized and the achievements attained.

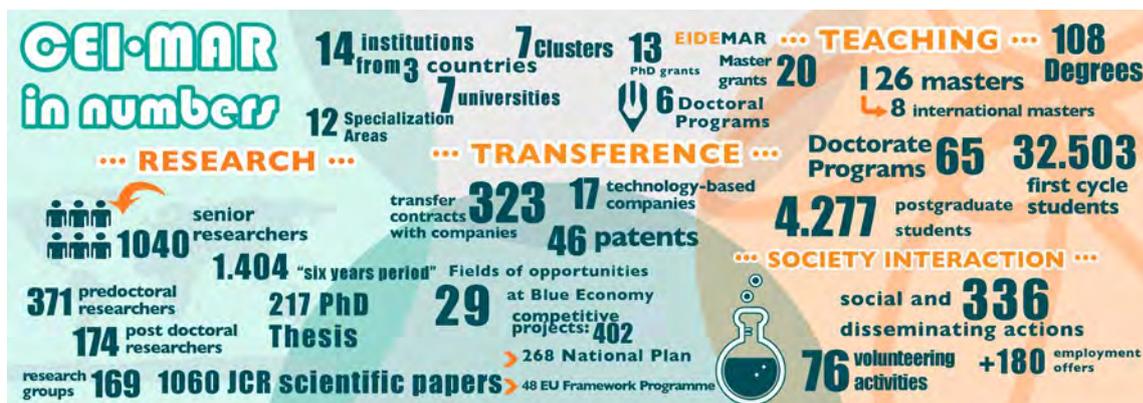
CEI-MAR is also a sustainable campus, that safeguards energy efficiency and sustainability, recycling, reusing waste, clean transport, and equality (sections B.8 and C.6). Programmes have been developed to improve the energy efficiency of its installations, and the Ecoports project, for example, has been promoted. This is a pioneering project in Europe that has been taken on by the Andalusian Regional Government in the Andalusian strategy for the environmental efficiency of fishing activities. The volunteer environmental and social action

programmes have been backed by CEI-MAR as essential elements for transmitting values to society and for developing environmental improvement programmes, in which citizens play a key role.

In conclusion, a separate analysis of the milestones achieved by CEI-MAR requires, however, a joint perspective. The Campus of Excellence, conceived not only as the sum of but also as a synergy of its potential, represents today, a commitment to the future of our region. The responsibility for its management, its progress and, overall, its national and international exposure in science, business and society, has been decisively assumed by the institutions that make up the partnership; a process that has also permitted the incorporation of new companies, public institutions, national and foreign researchers and, overall, society itself. CEI-MAR is extending its influence as an international reference point in the marine-maritime field, receiving contributions from institutions from all over the world. CEI-MAR has created an environment that invites to an in-depth study of the oceans, of their exploitation and their conservation, with the clear objective that this activity should directly affect society and contribute to its progress and to the socioeconomic development of this region in the south of the Iberian peninsula and the north of Morocco.

CEI-MAR has built bridges between Society and Science, between institutions, between disciplines, between companies and researchers, between countries; bringing research and innovation to business, knowledge to the people, memory to the present; showing a future that broadens our horizons and for which we are all working together.

CEI-MAR, the sea that unites us.



Project Management



PROJECT MANAGEMENT

The system of governance designed for the orderly running of the CEI-MAR International Campus of Excellence of the Sea, coordinates interactions between the 14 institutions which make up the Campus, each of which has a different form of governance, has different ways of working and varied interactions. The *management structure* for CEI-MAR is organised through a *public foundation*, the most rigorous, yet flexible model of governance possible for these Campuses, due to the legal and organisational security that it provides in comparison to other management models. The foundation is subject to rigorous standards for organisation, the deliberation and resolution of agreements, efficient economic management of its funds, participation of all CEI-MAR members in its activities and the fiscal benefits that it provides. It is suitable, not only for managing public funds, but also for attracting prospective private resources. The CEI-MAR Foundation was registered, and subsequently recognised as a legal entity, in the Registry of Foundations of the Ministry of Education, Culture and Sport (19 May 2014).

The governance and administration structure for the CEI-MAR Foundation can be found in articles 10 onwards of its Statutes, drafted in accordance with legal provisions and supervised by the *Protectorate* of Foundations (Ministry of Education, Culture and Sport, Government of Spain). The supreme authority of the *partnership's management* is the *Foundation Board of Trustees*. It is a collegial body who, as such, calls for its members deliberation of the agreements and decides whether to sign them as a majority, in sessions formally called to this effect. In this way, the *Board* is a governing, administrative and representative body for the CEI-MAR Foundation. It is ultimately responsible for adopting CEI-MAR management decisions and running the Foundation. In this sense, the *Board* defines the CEI-MAR Foundation strategy which is outlined and disseminated periodically in the *annual action plans* (legal instrument that Foundations

must observe). Furthermore, the *Board* will dictate guidelines and mandates as needed in each case, approving annually the Foundation management, its results and use of funds.

The *Board* is made up of university rectors, presidents of member PRIs and business representatives that are part of CEI-MAR. The *Chairman* for the *Board* is the Rector of the University of Cadiz, who exercises decision-making powers which are foreseen in the statutes. The *Board* is lawful and is assisted in its deliberations by the *Secretary of the Foundation*. The day-to-day management of matters and the implementation of agreements made by the *Board* are entrusted to the *Executive Committee* (which holds more frequent meetings than the *Board*) and the Foundation's *Managing Director* respectively. The *Managing Director* is an independent professional, contracted as a result of an external tender. The powers and operating structure of these bodies are also clearly laid out in the Foundation's Statutes; with an emphasis on paying special attention to enforcing the *Board's* strategy, as they are accountable for this action.

The CEI-MAR Foundation has incorporated internationally prominent companies, known for their research and innovation activity, onto the *Board*: Cepsa, Endesa, Telefónica and Santander bank. These entities share the CEI-MAR Campus principles and strategies, transferring progress attained in marine-maritime studies to society as well as economic and industrial sectors. In the near future, other institutions, such as Navantia and the Confederation of Entrepreneurs of Andalusia (CEA) will join the *Board*. This last group will represent SMEs in the sector.

Due to its nature, agreements passed by the CEI-MAR Foundation *Board* require the commitment of all its institutions. The *decision-making strategy* operates from the entity itself, established by law and developed in the Foundation's Statutes. Decisions are technically shaped,



advised and reported on by six thematic *interinstitutional committees*, which raise their proposals to the *Board of Trustees*. All partner institutions participate in these inter-agency committees, with each contributing their most suitable specialists to the matters being dealt with. Each *interinstitutional committee* is coordinated by a Spanish university, which in turn means that when one speciality area needs to make a decision, it still engages joint action from members and ensures compliance with agreements made by the *Board of Trustees*. The outworking of these committees belongs to the collegial bodies.

Supervising the committees and enhancing initiatives undertaken is looked after by the **CEI-MAR General Coordinator**, jointly appointed by all the universities, from among their reputable teaching staff linked to **CEI-MAR** through its qualifications and research. The *General Coordinator*, therefore, directs the proposals of the *interinstitutional committees* to the board of trustees, essentially through the annual action plan proposal which the *Managing Director* presents. At the same time, the *Coordinator* supports the *interinstitutional committees* in their activity and ensures their compliance with the guidelines decided by the *Board*. The **CEI-MAR coordinating offices** organise the technical and day-to-day management of the Campus of Excellence, under the guidance of a **CEI-MAR Technical Coordinator** in each university. All offices are supervised by the *Central Office*, based

at the University of Cadiz. The **CEI-MAR General Coordinator** is head of all offices, managing the academic and organisational side of **CEI-MAR**.

The coordinated action of all entities described, allows them to define programmes, evaluate its scope of opportunity, quantify its cost and subsequently raise the proposal (by the channel which corresponds, depending on the entity) to the Foundation's *Board of Trustees*. Periodically, it gives account for the management of each group to the Foundation's Executive Committee, which orders the priorities, monitors the progress of the committees and the Campus as well as monitoring the results achieved. The coordinating offices provide all necessary support; with the **CEI-MAR General Coordinator** ensuring the follow-up and coherence of the entire process. The *Board* is the body that finally approves the Foundation's annual budget, deciding on funding for actions under consideration and setting them out in the budget and annual action plan. To these effects, as required by Law, the Foundation must submit annual accounts, according to a legally defined accounting model, and submit them to the Registry, for their records and public dissemination as well as to monitor the Protectorate. Although there is no legal obligation, the **CEI-MAR Foundation** submits its accounts to external audit, evidence of transparency and financial management as well as confidence in all its members.



Representatives from CEI-MAR promoting institutions during the assumption of the Campus General Coordinator, Professor Fidel Echevarría



Academically, CEI·MAR's activity is organized through the *International Doctoral School in Marine Studies*, EIDEMAR. It is run by a *Director* and an *Academic Secretary*, who ensure the day-to-day management of the centre. Its governance is comprised of an *Advisory Board* (main governing body), the *Steering Committee* (day-to-day governing body) and the *International Scientific Committee* (advisory body), all of them with the functions and responsibilities described in its internal rules, developed by all institutions involved in the centre.

CEI·MAR's structure is as *hierarchical* as it is *horizontal*. The hierarchy derives, legally, from the directives that the Foundation's *Board* sets, which define both normal and binding objectives and criteria that the rest of the entities should adhere to. The horizontal coordinated action ensures coherence of all the measures in place.

A similar process ensures the dissemination of actions among CEI·MAR research groups, *requiring and engaging their participation*. Apart from concrete actions decided on by the General Campus Coordinator to disseminate programmes, responding to claims from researchers; taking up and transmitting these initiatives; promoting more direct and effective contact among the academic community in each insti-

tution; and the CEI·MAR governance structure are all channelled through the *interinstitutional committees* and EIDEMAR. The participation of researchers in the various programmes is organised in different ways: from the 'academic freedom', that generally characterises university research activities, to the rigour that is embodied in those who have enrolled professionally in the Armed Forces (the Royal Observatory of the Navy, The Hydrography Institute of the Navy), through to those who have an 'intermediate' organisation and decision-making system (in general, the rest of the CEI·MAR PRIs). The members of the *interinstitutional committees* are therefore preferably the ones who disseminate the campus among their own research staff and who, in turn, define the capabilities that they can offer the Campus, proposing them in the CEI·MAR governing bodies.

In short, for CEI·MAR's activity to be effective, commitment is required not only from the institutions that comprise it but also from the teaching and research staff that comprise the Campus in their daily and ongoing responsibilities. Their participation is connected, either through the mechanisms of their own institutions or through the organisational structure of CEI·MAR.



CEI·MAR Foundation represents the governance model of the Campus. In the image, the trustees after the incorporation of Endesa, Telefonica and Santander Bank to the Board of Trustees

GOVERNANCE STRUCTURE

CEIMAR FOUNDATION

BOARD OF TRUSTEES

(university rectors, PRI representatives, companies)

EXECUTIVE COMMITTEE
(at least five representatives from the Board)

Foundation CEIMAR Manager
(Ana Arellano)

CEIMAR General Coordinator
(Fidel Echeverría)

INTER-AGENCY COMMITTEES



OBSERVATORY OF THE STRAIT (UMA)

J. G. Lafuente (UMA)
 M. Bruno (UCA)
 H. Castro (UHU)
 F.J. Niell (UMA)
 M.A. Losada (UGR)
 J. Rodríguez (UHU)
 F. Martins (Ualg)
 B. El Moummi (UAE)
 E. Huertas (CSIC)
 Sánchez/Mercado (IEO)
 J. Perez (ROA)
 A. Ramos (IHM)
 F.J. de los Santos (APPA)
 E. Alvarez-Fanjul (Pedalé)
 J.C. Maraver (SASEMAR)
 M.A. Manero (PNE)
 A. Troya (UICN)

COORDINATION OFFICES

UCA: Javier Benavente
 UMA: Xavier Niell
 UGR: Luis Cruz-Pizarro
 UAL: F. Javier Moyano
 UHU: Felipe Jiménez Blas
 Ualg: Oscar Ferreira
 UAE: Bouchta El Moummi
 CSIC: Julián Blasco
 IEO: Ignacio Sobrino
 IFAPA: Catalina Fdez.
 CAS: M^a Carmen García
 IHM: Juan Antonio Aguilar
 ROA: José Martín Dávila
 ARQUA: Iván Negueruela

EIDEMAR School of Doctoral Studies

ADVISORY BOARD
Vice-rectors with Doctorate responsibilities

STEERING COMMITTEE

vice-rectors and Doctoral Programme representatives

School Director

School Deputy Director

School Secretary

Doctoral Programmes:

- MARINE SCIENCE and TECHNOLOGY: J. Grada (UCA)
- MARINE RESOURCES: J. M. Mancera (UCA)
- MARINE MANAGEMENT AND CONSERVATION: L. Martín (UCA)
- MARITIME HISTORY AND ARCHAEOLOGY: D. Bernal (UCA)
- MARINE & COASTAL MANAGEMENT (Erasmus Mundus): A. Valls (UCA)
- BIOGEOCHEMICAL FLOWS AND THEIR APPLICATIONS: J. Gál Lafuente (UMA)

International Scientific Committee

Scientific Community. Companies. Society

Future Projections



FUTURE PROJECTIONS

The International Campus of Excellence (CEI from the Spanish) Programme came about with the **main objective** of *increasing the quality of the Spanish university system as a whole and promoting the international excellence of the best Spanish university campuses, via their partnership with other knowledge-based institutions and socio-economic stakeholders*. Other objectives of the International Campus of Excellence Programme included: (i) encouraging strategic partnerships between universities, other agents of knowledge, businesses and civil society organisations; (ii) promoting the differentiation and specialisation of university models and profiles in specific areas of knowledge, missions and geographical areas of operation; (iii) reinforcing international cooperation in education, research, innovation and global social aspects; (iv) developing new social and sustainable models of inclusive campuses; and (v) promoting universities' contribution to sustainable socio-economic development based on the knowledge of their immediate regional area.

The **CEI·MAR** International Campus of Excellence of the Sea culminated its implementation having achieved the objectives proposed in the CEI Programme. **CEI·MAR** has enabled the generation of a strategic partnership between five Andalusian universities, two foreign universities (in Portugal and Morocco) and seven PRIs. These were joined by socio-economic agents, large businesses, small and medium-sized enterprises (SMEs) and other collaborating universities and research centres, both Spanish and foreign ones. For the universities and research groups participating in **CEI·MAR**, this project has represented an extraordinary opportunity for smart

specialisation in marine-maritime subjects. It has managed to combine research excellence with the reinforcement of international cooperation, the transfer of knowledge to the productive sector, the socio-economic development of the area and the dissemination of the acquired knowledge among the general public. All of this was achieved without losing sight of the international dimension of the campus, which has worked to reinforce cooperation with other countries, both in terms of education and in terms of research, innovation and dissemination. Similarly, significant efforts have been made in matters of sustainability, attempting to produce an inclusive campus. Lastly and most importantly, the presence of **CEI·MAR** and the activities driven by this campus of excellence in its geographic area have encouraged universities and research centres to contribute to sustainable socio-economic development and regional development based on knowledge, also facilitating changes in the productivity model.

Almost five years after having gained official recognition as a campus of excellence, **CEI·MAR** is now a reality that is recognised by the general public, the same community that the partner institutions are embedded in. In essence, this is a South of the Iberian Peninsula campus, with marine-maritime research activities that involve the participation of all the institutions of the five Andalusian coastal provinces (Almería, Granada, Málaga, Cádiz and Huelva). Participation also comes from the Algarve and the Northern Province of Morocco, as well as from universities and PRIs which are bringing together and managing all their marine knowledge. In this geographical area, there is a notable **CEI·MAR**



Geographical coverage of CEI·MAR promoting institutions



The acknowledgement to the activities done by CEI-MAR is an encouragement for further advance in teaching, research and transfer in the marine-maritime field. In the image, the President of the Andalusian Government give the R+I+i Award of the Social and Environment Foundation of Andalusia

presence in the local and regional media and the CEI-MAR image is particularly positive, it being frequently associated with opportunities for development within the region. The projection of the Campus of Excellence has also been very significant in international circles. The recognition of the activities carried out by the CEI-MAR Campus of Excellence is further exemplified by some of the awards it has recently received from various sources (The Academy of Social Sciences of Andalusia and the Environmental Department of the Andalusian Regional Government, among others).

CEI-MAR is the Spanish campus with the greatest number of countries involved as partners (three), with the greatest number of participating universities (seven) and with the greatest number of member institutions (fourteen); this high number of partners subsequently increased further with the participation of large businesses and SMEs. The launching of this campus of excellence has signified a profound remodelling of some of the basic structures of the member institutions, through an organisation whose key structure, the CEI-MAR Foundation, is formed of a legal entity in which all CEI-MAR members participate. Other institutions have also joined it, namely large businesses such as ENDESA, CEPSA, Banco Santander and Telefonica. More recently, the Foundation was joined by another partnership, the Confederation of Entrepreneurs

of Andalusia, representing the SMEs of the area. The Foundation was created in view of medium and long term stability and permanence, by coordinating the activity of all the members of the partnership and their relationships with third party institutions. Throughout the development of the CEI-MAR project, there has been a high level of involvement in the programmed activities from all the members and this is a trend which must be reinforced in the future, through the CEI-MAR Foundation.

CEI-MAR carries out its academic activity and, in part, its research, knowledge transfer and innovation activities via the *International Doctoral School in Marine Studies – EIDEMAR*. This international doctoral training centre is therefore essential for the development of the strategies of the International Campus of Excellence. These two bodies, the CEI-MAR Foundation and the EIDEMAR School, are fundamental in the future development of the partnership and they will be key driving forces in the future of CEI-MAR.

In addition to the CEI-MAR Foundation and the International Doctoral School, CEI-MAR has generated other organisations throughout the progress of the project. These can be differentiated by the missions they are assigned and they will play a significant role in the future of CEI-MAR. Among others, it is worth noting the network of research institutes associated with the universities enrolled in the partnership. These include: the *Centre of Marine and Environmental Research (CIMA)* and the *Centre of Marine Sciences (CCMAR)*, both in southern Portugal; the *International Centre of Ecological and Environmental Studies and Conventions (CIECEM)* in Huelva; the *Marine Investigation Institute (INMAR)* in Cadiz; and the *Institute for Earth System Research in Andalusia (IISTA)* in Granada. Furthermore, there is the *Marine Research Laboratory (LABIMAR)* in Cadiz, the *Marine Classroom (Aula del Mar)* in the University of Granada, the *Photobiology and Advanced Primary Production* labs in the University of Malaga and the *Aquaculture Plant* of the University of Cadiz, among others.



The formation of a combined **CEI·MAR network of scientific infrastructures** with more than 200 pieces of top-level equipment which form the "Science and Technology central services" of the partnership will be another of the pillars of future **CEI·MAR** endeavours. Special mention should go to the UCADIZ, the first oceanographic vessel supported by a Spanish university and the only one which is currently based in an Andalusian port. It is an oceanographic vessel which provides services to the entire **CEI·MAR** partnership and it performs duties for research excellence, advanced teaching and for dissemination and connection with the general public. The Business Transfer Centre, whose construction process has already started, will become a member of this network and it will be directly oriented towards research focused on the need for innovations in the marine-maritime sectors. It is forecast to be an international benchmark in this field and another key piece in **CEI·MAR's** future.

A fundamental event in which **CEI·MAR** played a highly central role was in enhancing the inter-relationship between Science, Technology and Business, driving and supporting business innovation, establishing opportunities for growth, creating new technology-based companies, influencing the definition of regional innovation strategies via its noteworthy participation in the creation of the RIS3 for the Algarve and Andalusia and organising a system of relationships between all those interested in innovation. All of this has

led to the creation of an **Innovation Ecosystem in the marine-maritime sector**, with a highlight being the participation of companies and other business entities in the **CEI·MAR** Foundation. They form part of the formal and informal structures which sustain the relationships between the stakeholders in Blue Growth and which contribute to the sustained impetus of innovation. They have become the motor of the **CEI·MAR** Innovation Ecosystem.

Future actions in the field of IMPROVING TEACHING:

CEI·MAR has defined each one of its strategies, particularly that of improving teaching in the institutions of the International Campus of Excellence. It did this by outlining a range of education which is internationally recognised due to its qualification, required due to its specialisation and taught because of the intensity of its proposed and feasible objectives. **CEI·MAR** offers a set of courses which respond to the excellence required for the very idea of the Campus. At the same time, the **CEI·MAR** offer has supposed the specialisation (and consequentially the differentiation) of the institutions of the Campus of Excellence. The **CEI·MAR** qualifications define a unique and distinctive teaching range, a teaching (and training) profile which addresses all the relevant fields of knowledge, the arts and the professions linked to the marine-maritime world. This is an offer academically ambitious, despite aiming for exhaustiveness, due to its



CEIMAR Foundation and the International Doctorate School on Marine Studies (EIDEMAR) are two fundamental pillars for the future of this Campus



projection over all disciplines, is also flexible: it adjusts to the new (always changing, in a constant state of renewal) demands of the business sectors which require ongoing innovation and to a general public which wants new ways to access science and its dissemination.

The courses offered by CEI·MAR were conceived in flexible terms, both in its teaching (ensuring that it adapts to the needs of those who request it) and with regard to its own definition, given that it is constantly enriched with the experiences and contributions of its members, the businesses sectors for which it is intended and the social initiatives which are created. The concurrence of all disciplines within CEI·MAR ensures that attention is paid to all the interests which may be proposed in the field of the Campus of Excellence and in other national and international settings, when necessary.

CEI·MAR's will to provide a social service justifies its natural vocation and disposition to project itself beyond the strict field which, in principle, would delimit its field of action (that defined by the universities which make up the partnership, the PRIs which support the Campus of Excellence and the socio-economic agents which participate in the actions). It can thus reach national and international spaces. Therefore, CEI·MAR has worked on the participation, consolidation and integration of networks, both nationally (CEI·MARNET) and internationally (IBERMAR, EUROMARINE). Each of them has benefited from the CEI·MAR name and, at the same, the truly international horizon of the Campus of Excellence has been enriched. CEI·MAR's actions have always been along the lines of addressing the interna-

tional panorama as an unavoidable activity and challenge, due to what this supposes in terms of Campus recognition, but above all due to the inherent scientific and social commitment arising from its status as a public body. The actions of CEI·MAR have been aimed at projecting its own range of training courses to diverse settings and via different media: from strategic alliances with foreign universities and governments, to the consolidation of highly qualified relationships with institutions of international prestige. This is the framework which defines CEI·MAR's actions in matters such as double qualifications, specific agreements (particularly those concerning co-tutelage of doctoral theses), specific initiatives for the international training of doctors and, lastly, the CEI·MAR seal of excellence system.

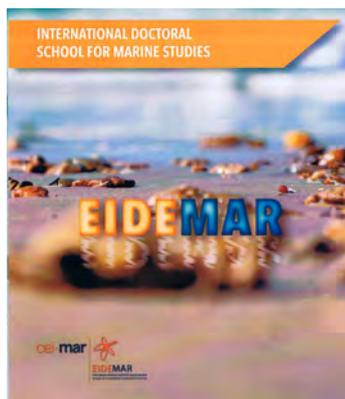
All of these circumstances have contributed, with varying intensity, to defining the current courses that CEI·MAR offers, forming a solid base upon which it is now possible to propose a future strategy based on the experience gained from five years of effort and achievements.

1. EIDEMAR, the International Doctoral School in Marine Studies

The basic centre from which CEI·MAR has organised the teaching activities of the International Campus of Excellence is EIDEMAR, *The International Doctoral School in Marine Studies*. The centre, that was specially designed to respond to the specialities of a Campus of Excellence as ambitious as CEI·MAR, will maintain (and even increase) its relevance as a cornerstone of the training activity of said the Campus of Excellence.



The participation in national (CEI·MARNET) and international (EUROMARINE, IBERMAR) networks will be a key point in the future development of CEI·MAR



EIDEMAR has a clear international vocation, being the basic cornerstone to organize the training and formative activities of CEIMAR in the future

Both institutionally and organically, **EIDEMAR** is now fully operational and ready to assume the duties which are assigned to it by the Foundation's board of trustees, via the Governing Council of the School. Said duties include, among others, the design and implementation of new doctoral programmes with national and international institutions, the admission of new official master's degrees, the organization of the ongoing and on-demand training required by professional sectors, the promotion of the activities of the *International Summer School* and the provision of the necessary coverage of seminars and conferences of excellence. **EIDEMAR** is also a qualified ambassador of **CEI-MAR**, this being the best presentation of the potential of the International Campus of Excellence which houses the harmonisation of teaching, research, innovation, a commitment to employment and the social transformation of its surroundings.

- ▶ The future strategy of the **EIDEMAR** International Doctoral School includes the creation and assignment of new doctoral

programmes and master's degrees which are consistent with the multidisciplinary nature of **CEI-MAR**. The strategy is based not only on the assignment of qualifications that are already taught by the universities or by other **CEI-MAR** institutions, but also and particularly on the design of new qualifications which, in each instance, take advantage of the collaboration opportunities offered by the Campus of Excellence and the need for specialisation required in the **CEI-MAR** milieu.

- ▶ The incorporation of new qualifications will be done with participation and collaboration criteria between the Campus institutions and the procedure will be defined using the following formulae:
 - ◊ The collaborative design of new official qualifications by **CEI-MAR** universities, ensuring balanced participation from other institutions involved in the Campus, so that they can therefore access the official training. Among the opportunities detected in this field, there is the creation of an *Official Master's in Hydrography and Nautical Cartography*, a field which requires a unique specialisation which **EIDEMAR** can offer by collaborating with the Hydrographical Institute of the Spanish Navy, a member of the **CEI-MAR** partnership. The Official Degree in Hydrography is a qualification required to be able to perform official hydrographic surveys. The qualification is awarded by the *International Hydrographic Organization (IHO)*.



The future strategy of EIDEMAR includes the reinforcing of unique masters as the Interuniversity master in Oceanography, the master in "nautic and subaquatic archaeology" or the Erasmus mundus master "Water and coastal management (WACOMA)"



Currently, the only Spanish institution which is accredited by the IHO is the Hydrographical Institute of the Spanish Navy, a centre which teaches this official qualification exclusively to naval officers. CEI-MAR, in collaboration with the Spanish navy, will be the sole Spanish institution which will teach the specific content of this degree. Obtaining the Official Hydrographer qualification will provide access to both national and international job markets, given that the sources of this training are scarce at an international level (which directly commits this strategy with the international plans of CEI-MAR). The professional potential (transoceanic telecommunications companies, companies dedicated to maritime prospecting, among others) is also very high.

- ◇ The design of new official qualifications together with other national institutions, particularly with the marine-focused campuses of excellence in Spain. This initiative has already been put into motion with notable success, with the implementation of the *Interuniversity Master's in Oceanography*, a master's which is taught in the heart of the network of marine campuses of excellence, CEIMARNET. CEI-MAR, which presides over the commission responsible for the network for the implementation of new qualifications, managed to assemble the *Atlántico Tricontinental*, *Campus do mar* and CEI-MAR campuses of excellence around this qualification. The collaboration strategy between these campuses has facilitated the collective use of costly and unique resources: oceanographic ships, managed through COCSABO, the national commission which coordinates the Spanish oceanographic fleet and of which CEI-MAR is a member through the President of the CEI-MAR Foundation (the class of

2015-16 was therefore able to carry out an oceanographic expedition on board the Spanish Oceanography Institute (IEO from the Spanish) ship, the *Ángeles Alvariño*). It should be remembered that the IEO is also a CEI-MAR member. The aARNET commission is working on the integration of the four campuses of international excellence (the aforementioned plus *Mare Nostrum*, led by the University of Murcia) in the teaching of three new inter-institutional master's. (1) *Fishing Management*; (2) *Integrated Management of Coastal Areas*; and (3) *Subaquatic Technology*.

- ◇ The design of new qualifications together with PRIs, companies and institutions. The creation of a qualified range of training which fulfils the training needs of the CEI-MAR PRIs and the companies present around the Campus is one of the priorities of the future. This ensures that the training corresponds with the up-to-date needs of these other CEI-MAR members and it guarantees a commitment to the area and to its development. CEI-MAR has designed specific protocols for the collaborative training between universities and the other members of the partnership. It involves the participation of the institutions, businesses and professionals both in official regulated teaching and in *ad hoc* teaching, based on specific training requirements. When these activities do not require stability, they will be organised within a self-teaching system (as will be explained below). The aim is to procure training which is suited to the demands of said institutions. This not only involves adapting the training content and constantly updating it, but also a review of the teaching methods (blended, online, etc.), the timetabling and the teaching and learning spaces (laboratories, workshops, business headquarters, etc.).



- ◇ The design of new qualifications together with other international institutions. Using the double qualification system, or, when applicable, the design of new specific qualifications, **EIDEMAR** will continue with its policy of collaborating with institutions of international prestige. The initiative has also borne fruit up to the present, allowing it to use a tested collaboration model which is optimised for the pertinent interests in the presence of all the institutions. Indeed, this model is used for the Master's and Doctorate double qualifications of the University of Ferrara (Italy), the National Autonomous University of Mexico (UNAM, via the Institute of Limnology) and the Hydro-meteorological State University of St. Petersburg (Russia), among others. Notwithstanding the fact that other opportunities are being gradually discovered, either in new qualifications or in the extension of existing qualifications, work is currently being undertaken on a double qualification between the *Master's in Underwater Archaeology* from **EIDEMAR** and similar qualifications from UNAM. Other qualifications will be defined in the future, based on accumulated experience which has been proven effective. Thus, relations will be initiated in France with the *Maritime and Oceanic Law Centre* of the University of Nantes, which specialises in maritime law.
- ▶ Institutions and businesses will be encouraged to enrol in the training, regulated (official) or not, of the **CEI-MAR** qualifications which offer the best opportunities for sharing the academic space with professionals. The classic formulae for this correspond to the models, established in the universities, of academic or business classrooms (and external collaborators). In particular, the creation of new classrooms which outline the relationships between official qualifications and businesses will be addressed. This will even allow the transfer of training to workshops and businesses' headquarters. Therefore, among other things, to ensure the best quality in the training offered in the Master's in Naval and Oceanic Engineering, classrooms will be created with the Official College of Naval Engineers of Andalusia (COIN) and with the company NAVANTIA.
- ▶ Another of the future objectives of the **EIDEMAR** School is to consolidate and broaden the relationships that the **CEI-MAR** institutions maintain with other prestigious institutions abroad, promoting student and teacher mobility, double qualifications, co-tutelage theses and other interaction means. We will consolidate the close relationships we have with the universities in Ibero-America, North Africa and the post-Soviet area, although we are also working on a priority basis in European and North American areas. We will increase, through agreements, the **EIDEMAR** connections with other European and North American doctoral schools. We are already in the late stages of negotiations with various schools in England (Southampton, Plymouth), France (Brest, Villefranche), Italy (Naples, Venice), Israel (Haifa), Holland and the USA (UCLA, USC).
- ▶ In particular, **EIDEMAR** has already begun a policy of strategic alliances with other doctoral training centres (schools) in Europe: Portugal, France and England. This always refers to universities and research centres which specialise in marine and maritime sectors, thus allowing the identification of new areas of collaboration.
- ▶ The international networks in which **CEI-MAR** participates (the **IBERMAR** network in Ibero-America, in which **CEI-MAR** was the driving force; the AUIP network - the Ibero-American Postgraduate University Association, currently presided by the



The Award "Seal of Excellence CEI-MAR" granted to the Universities of Ferrara and "Autónoma de Mexico" is the starting point to build a solid international alliance network with prestigious Universities

president of the **CEI-MAR** Foundation; and the **EUROMARINE** network in Europe) must also serve to favour this process of increased internationalisation in **EIDEMAR** and **CEI-MAR**.

- ▶ The **EIDEMAR** and **CEI-MAR** alliances policy includes, among other aspects, extending the recognition gained from the **CEI-MAR Seal of Excellence** to other institutions of international prestige. This is a seal which distinguishes the prestigious institutions with which **CEI-MAR** maintains preferential relations. Currently, because of the intensity of the relationship, this distinction was awarded to the European University of Ferrara (Italy) and to the Ibero-American UNAM (Mexico). The network of inter-institutional relationships generated with other universities and research centres throughout the world is growing progressively. In the near future, the **CEI-MAR** seal of excellence shall recognise other universities with which we are already working, as these effective relationships are strengthened. seal of excellence shall recognise other universities with which we are already working, as these effective relationships are strengthened. In this way, the qualifications agreements with the University of Southampton (UK) and the University of Southern California in Los Angeles (USA), among others are in advanced state. As well, the initiated collaboration with the *Woods Hole Oceanogra-*

phic Institution (WHOI) will probably grant a new **CEI-MAR** seal of excellence. Due to the nature of the activities which are strengthened with this seal of excellence, **EIDEMAR** will once again enjoy the prominence in the awarding.

- ▶ The future of **CEI-MAR** also supposes the reinforcement of the relations between the members of the Campus of Excellence, especially the foreign ones, increasing the range of qualifications and combined training activities on offer. This includes those between the Algarve University in Portugal and Abdelmalek Essaadi University in Morocco and those to which this proposal is directed. From the very conception of **CEI-MAR**, intense collaboration work has been carried out with these institutions, encouraging the development of combined projects and activities which will intensify immediately. The main evidence of the actions undertaken is manifested in the recent concession of the European Project within the Erasmus *Capacity Building* call for proposals, obtained by **CEI-MAR** (awarded in August 2016) and titled *Innovative Training for Smart Coastal Management and Sustainable Blue Growth (SCOLA-MAR)*. The objective of the project is to generate well-trained professionals in Morocco, people who are adapted to the needs of the job market so that the employability of Moroccan graduates is increased. To reach its objectives, the **SCOLA-MAR**



CEIMAR will continue leading the academic-scientific cooperation between Europe and the North of Africa, as demonstrated through the Erasmus “Capacity building” project SCOLA-MAR, recently obtained, with 3 CEIMAR Universities involved from 3 different countries

strategy is to initiate an innovative and specialised Master's Programme based on the integration of the multi-disciplinary dimension of marine sciences. Said Programme will train Moroccan trainers with a view to reinforcing their ability to transfer their knowledge to the students. Eight members, four Moroccan universities (among which is Abdelmalek Essaadi University) and four European universities (including two CEI-MAR universities – Cadiz and Algarve) are participating alongside the Universities of Western Brittany (France) and Venice (Italy). The CEI-MAR Foundation has also come into the project as a collaborative entity, thus guaranteeing the presence of other CEI-MAR institutions in the initiative. Once again, EIDEMAR will be the most prominent member of the partnership.

- ▶ Reinforcing the international master's degrees that are offered entirely in English, starting a specific line of new CEI-MAR Erasmus Mundus Master's and Erasmus Mundus Marie Curie Doctorates (H2020). The specific proposals of the Erasmus Mundus qualifications will be agreed within a consortium which was founded for that purpose, with participation from the foreign universities (European and non-European) with which the qualification was designed. In this respect, a pro-

ject with the University of Ferrara is already in an advanced state. It should be noted that the backing of training models in English does not suppose the renunciation or abandonment of the objective value of Spanish and, possibly, other languages (chiefly French, due to its proximity and specialisation) which will be similarly promoted within the framework of CEI-MAR activities.

2. Other relevant training actions

If, due to their nature, some of the CEI-MAR activities must take place exclusively in a qualified centre, such as a doctoral centre (see those listed in previous paragraphs), other activities, even though they have their own substantivity, have been organised with notable success under the shelter offered by EIDEMAR. Inasmuch as this has allowed a greater international diffusion of said activities and, above all, that their organisation within EIDEMAR allows the establishment of relations with the qualifications assigned to the centre (talent attraction), they will continue within the framework of the International Doctoral School. We are referring here to two types of activities:

- ▶ The range of specialisation courses offered each summer by the International Campus of Excellence with the CEI-MAR **International Summer School**. There have already been three editions of the Summer School and it is now seen as an international benchmark (it is taught in English) which is especially qualified due to its relationship with the EIDEMAR doctoral programmes. Its successive editions have shown evidence of the progressive involvement of the CEI-MAR institutions and other members of the Campus of Excellence, which has allowed it to be conceived as an itinerant operation (even in the Galapagos Islands, Ecuador) noticeably multiplying its potential for CEI-MAR diffusion and the projections of its activities



CEIMAR will expand its formation offer to attend the formative needs of every marine-maritime sector

and training model. As of today, the main actions of the fourth CEI-MAR ISS have already been planned, with CEI-MAR guaranteeing its continuation and growth. The ISS will increase its field of diffusion every year along with the different locations in which it will be taught, diversifying its courses and the attraction of foreign students and researchers.

- ▶ Another relevant initiative which will be strengthened in the future is the **CEI-MAR Conferences of Excellence**. These are conferences which are presented by prestigious researchers, streamed online and recorded in the CEI-MAR archives so that they can be viewed on demand. EIDEMAR will coordinate and regulate this activity which is aimed at a more specialised public, including doctoral students, but also at master's and graduate students.

3. The range of *internal teaching (permanent training and on-demand specialisation courses)*

Although the initial CEI-MAR training model has taken into consideration the academic world, the meeting point between basic training, qualification, research and innovation, and the backing of knowledge transfer to the business world (the application of generated industrial knowledge) has also been a constant in the Campus of Excellence. This is because CEI-MAR came about

precisely to promote contributions, from universities and research centres, in sustainable socio-economic development, from the unique perspective offered by its specialisation: the sea. Faithful to this commitment, CEI-MAR will continue to drive the research which, viewed from any of the branches of science, contributes to the improvement of its social and business environment, taking on the most specialised training which is required in any of the arts, professions, companies or industrial activities which coincide with CEI-MAR fields of operation.

This training requires certain profiles which are distinct from ordinary university teaching; the content and the teaching itself must be adapted to the demands of a professional world which has moved away from academic systems. The aim is to therefore offer a range that is especially designed for working people who require access to technical innovations which would otherwise be difficult to access. It is taught in a format that is adapted to availabilities and business activities. It is a new *language* which maintains the intensity of university-business relationships. Based on this,

- ▶ CEI-MAR will expand the catalogue of training activities of the EIDEMAR doctoral programmes, adapting it to the best research training for the doctoral students and the ability to attract talent from other national and foreign universities.
- ▶ CEI-MAR will periodically update the EIDE-



MAR catalogue of *internal teaching* which is specially designed to ensure the application of the knowledge generated by the International Campus of Excellence. To do this, it will take advantage of the channels established between businesses and **CEI-MAR**. It will create, alongside the businesses and public institutions which are involved in permanent training, a catalogue of the needs of the businesses and industrial sectors associated with **CEI-MAR**. This catalogue will quickly respond to the private or public initiatives which are proposed for the creation of employment, the improvement and qualification of training and the plans for the reindustrialisation of services. Said catalogues will be written in an orderly, comprehensive and coordinated manner, so that all the official studies offered by **CEI-MAR** converge with the professional teachings. This will keep **CEI-MAR** as the benchmark centre for scientific and professional activity within our business environment, as a privileged agent of qualified training and as a model for the social dissemination of Marine Sciences.

- ▶ This will be especially guaranteed because the range is not limited to just the highest levels of training (university qualifications), but it equally encompasses medium levels and professional training. The latter are the seeds of the more traditional production activities, self-employment and the provision of basic services that are essential for the development of in-depth industrial projects (auxiliary enterprises).
- ▶ A specific protocol will be designed to encourage the realisation, both in terms of their creation and associated theses, of end-of-year projects (End-of-Degree Assignments and End-of-Master's Assignments) in collaborating enterprises and institutions, thus ensuring correspondence between the studies offered and the enterprises needs. In this field, collabora-

tion with SMEs is essential due to the high number of SMEs which are associated with **CEI-MAR** and the diversity of the disciplines which can be addressed (notwithstanding any SMEs' status as auxiliary companies of large industries).

4. Backing innovation in teaching

In the field of teaching innovation, **CEI-MAR** will maintain its strategy of backing training based on innovation; a strategy which will become manifest on three fronts:

- ▶ The approval of new calls for grants for innovative teaching projects, which will go beyond the field of the **CEI-MAR** institutions so as to attract initiatives from any of the sectors in which **CEI-MAR** is present: institutes, professional training, other research and innovation centres, etc.
- ▶ Once we have created the public archives of teaching material, an important objective for the future consists in supplying these tools with new, free-to-access products (these will be essentially generated through initiatives for innovation and improvement in teaching) and of encouraging their use by the **CEI-MAR** community and the general public. The programme for innovation and improvement in teaching plans to address: actions to encourage the utilisation of teaching and learning systems and methodologies among campus teaching staff; the promotion of the mechanisms for the training and self-training of teaching staff; and collaboration between university members in order to enrich teaching activities with the experience of PRIs and the students themselves.
- ▶ The range of training offered by **CEI-MAR** is suitable for diffusion through the online courses system. It will be promoted via new calls for innovation projects, the realisation of free-access courses, by adapting the availability of resources to the new



CEI-MAR will enhance its online courses portfolio, with new proposals in the CEI-MAR Youtube channel

techniques and opportunities offered by the internet and communication technologies. The integration of all the generated material will, in the short term, generate marine-themed audiovisual courses and products, taught in a free-access format by the best international researchers. This free-access range will be an excellent showcase for the CEI-MAR Campus of Excellence, opening up the most advanced content to students throughout the world.

- ▶ The backing of new, unique teaching spaces in which research shares time and resources with ordinary training (of any level) and social diffusion. The success of initiatives such as LABIMAR or the Marine Classroom corroborates the fact that CEI-MAR's backing of this teaching model engages the general public and all the social and economic agents in the training.
- ▶ The creation of a *Laboratory of Maritime History and Underwater Archaeology* will begin immediately. It will house and specialise in a variety of studies with regard to the matters addressed by CEI-MAR and will allow its presentation to similar research institutions in the rest of the world.

5. CEI-MAR's projection

CEI-MAR must become a focus point of talent attraction with the ambitious objective of making external institutions, researchers and trainees consider it as an excellent opportunity for training

in marine-maritime subjects. The work undertaken in the last five years has been the seed for the best institutions to seek our collaboration and to convert the CEI-MAR postgraduate studies into an international reference point which continues to attract students from countries throughout the world, thus encouraging the mobility of postgraduate, both master's and doctorate, students. To reinforce this ambitious objective, in the future, CEI-MAR will implement a series of programmes:

- ▶ CEI-MAR will consolidate a **Global Programme of International Mobility** (the NEPTUNE Programme: *Networking, Promoting and Tuning Education around the Sea*). This will give special preference to the mobility of master's and doctorate students and to attracting grant and aid programmes in order to attract postgraduates (Master's-Professionalization students and Doctoral-Research students). Furthermore, it should convert the NEPTUNE network of Erasmus+ international mobility into a global network for the international mobility of graduates, master's students, doctorate students, PRIs and Administrative Staff. It should promote mobility through the attracting funds not only in the Erasmus+ Programme, but also through agreements with universities, state bodies and supra-national organisations, such as the AUIP.
- ▶ Another programme we are going to initiate is the Attraction of Post-Doctorate Talent Programme (the ATLANTIS Programme).



This will be a specific programme to offer young postgraduates post-doctoral 'jobs' with a duration of 2-3 years. The objective will be to attract talent that has graduated from prestigious universities. These graduates will use CEI-MAR as a platform to improve their CV and, at the same time, CEI-MAR will be able to select possible future candidates to enter a 'tenure track'. To do this, CEI-MAR must seek funding and create a programme which allows it to offer Post-doc research positions in its institutions. The completed work, the available infrastructure and the international projection achieved by CEI-MAR make it an international benchmark which is desirable to international researchers. This results in an increase in the quality of the partnership's research and teaching.

- ▶ The creation of the TRITON Network of International Work Experience. This will be created with the objective of increasing employability and professional mobility on a global scale by establishing a collaboration network with research companies and institutes, for the realisation of international internships by post-graduates or final year students outside of the national field of CEI-MAR students. At the same time, this will encourage internships in national businesses by international students.
- ▶ **The Teacher Training Programme.** A specific plan will be established for the teacher

training of professionals and academics that are qualified in various fields (from aquaculture to tourism), through a range of special courses and training modules with international prestigious teaching staff. This programme could be connected to the *International Summer School*, although this is not a necessity.

6. Mobility in CEI-MAR

The last aspect to be highlighted with regard to the future improvement of teaching is related to student mobility within the scope of the Erasmus Programme. In 2015 the CEI-MAR Foundation obtained the KA-108 Accreditation of *Higher Education Mobility Consortia*. It will be in force until 2017 and it encompasses the five universities in Andalusia. This has meant that there were a total of 161 movements in 2015, bringing in €409,595 of funds, and 177 movements in 2016, garnering a total of €345,412 of funds. We have therefore started along a path on which the CEI-MAR Foundation will be the FFF recognised entity which will receive these funds which are intended for mobility.

In the future, we will consolidate this position and expand the network of institutions with which we have mobility agreements. Lastly, our intention is to strengthen CEI-MAR and the EIDEMAR doctoral school and to convert them into global-level academic and scientific benchmarks in marine and maritime training. This is so that they will become a hub for talent attraction



Students and researchers international mobility will continue as a priority in the internationalization strategy of the campus. In the image, Erasmus students at the University of Almería



and so that world-famous academic and scientific institutions will contact it so as to propose combined projects and academic activities.

7. Backing specific training

CEI-MAR aspires to produce and manage the *reopening* of the local Naval College (for the training of officers and non-commissioned officers in the Spanish Navy). In doing this, it will consequently provide professional services not only to the Spanish Navy but also, as has been occurring through various initiatives, to other Latin American allied nations with which we have everlasting historic and strategic links.

The Cadiz province is home to numerous, highly qualified **CEI-MAR** institutions: in addition to the UCA, there are CAS-IAPH, IFAPA, CSIC, IEO and leading companies such as Navantia, APM Terminals, etc. There are two among them which are part of the Spanish Navy: the Royal Observatory of the Navy and the Hydrographic Institute of the Navy. This province has been historically linked to the Spanish Navy, particularly the area around the Bay of Cadiz, with cities such as: **Cadiz** (the home of the first Royal Surgeons Hospital of the Navy, which was the origin of all Spanish university medical faculties, and the *Casa de Contratación*, which, for seven decades, monopolised the maritime traffic with Latin America); **San Fernando** (where, within the shelter of the *San Carlos military town*, there was and, in part, there still is the naval armament industry, shipyards, military schools, the Pantheon of Illustrious Mariners, the *Capitanía General* – now the High Command building – and the Naval Museum); **Rota** (the site of the Navy Base); **Puerto Real** and **Puerto de Santa Maria** (the names of which – Port Royal and Port of Saint Mary - refer to their assistance in naval construction with their shipyards and docks); and **Sanlúcar de Barrameda** (from whence Magellan and Elcano set sail on their first circumnavigation of the globe, 300 years ago). These places are eternally linked to the maritime adventures which led to the Age of Discoveries, the use of sailing sciences and techniques, na-



Within future prevision, CEI-MAR aspires the reopening of the Naval College for training Army officers from Spain and Latin America.

val construction, the mixing of cultures, the new vegetable species brought from the other side of the ocean, wealth and poverty and to those protagonists of the deeds of illustrious mariners, all under the common name of the Spanish Navy.

Also, in 1717 in Cadiz, King Felipe V ordered the construction of an Officer Cadet Academy which trained officers to safeguard both the possessions of the crown on the high seas and the maritime traffic to and from the Indies. It was the first in Spain. Almost uninterruptedly, the tradition of naval military training has been a constant presence in the area due to the Naval College (in San Fernando from 1769 until 1943), in an exclusive way for a long time, but at other times with schools in other cities. Nowadays, the tradition of military schools continues in Spain (and in Ibero-American countries which uphold similar traditions to ours, some examples of which have been evident in the work of **CEI-MAR** over the years) and it is the place to go to gain qualified training which is chiefly linked to the engineers, non-commissioned officers and officers of the navy.

The military community near **CEI-MAR** justifies the interest the Campus of Excellence has in offering training services, up to doctorate level, for this specialised professional world, linking **CEI-MAR** to its surroundings and attracting traditions just barely shown here. Indeed, **CEI-MAR** offers a range of training in all the disciplines covered by similar centres in Spain, in addition



to opportunities which are unique in the country (and therefore in a good number of countries with which the Campus has relationships and to which it provides similar training services). Hydrographic studies, Doctoral Programmes, some engineering degrees, master's degrees that are linked with maritime professions – these define the range which is offered by CEI·MAR.

Future actions in the field of IMPROVING SCIENCE AND KNOWLEDGE TRANSFER:

As indicated throughout the report, international projection marks CEI·MAR's activities in the various fields. In the case of research and knowledge transfer, it is the backbone of all the partnership's activities and actions. The Horizon 2020 EU Framework Programme for Research and Innovation (H2020), as well as the specific strategy for *Blue Growth* from the *Directorate-General for Maritime Affairs and Fisheries* of the European Commission, form the framework of reference for our actions in R+D+I. CEI·MAR has and continues to participate very actively and significantly in European networks and associations for research and innovation which are linked to H2020.

Simultaneously, CEI·MAR's commitment to the socio-economic and regional development of our geographical area of influence, particularly through our support of business innovation, requires research which gives preferential attention to the resolution of society's challenges. This must have a clear international perspective but it must also be aware of the opportunities, objectives and needs collected in the regional development strategies of the Campus's geographical area of influence.

Alongside this double perspective of research which has international projection and which is useful for society's progression and citizens' welfare, the other key point of the CEI·MAR's research and knowledge transfer is scientific and, in general, academic excellence. And obviously,

the fourth leading element of our strategies is marine-maritime specialisation, in every possible approaches to knowledge, i.e. specialisation in the sea but with a multi-disciplinary perspective.

In terms of the future, CEI·MAR is directing its research and knowledge transfer strategies in accordance with these four key aspects: excellence, internationalisation, proximity to the local area and specialisation from a multi-disciplinary perspective. These actions are aimed at achieving the following goals:

1. Strengthening research of excellence

The *reSEArch* Plan outlines the actions in order to strengthen the Campus's research excellence. Actions with great scope will be established by the partnership via the triennial editions of the *reSEArch* Plan and with economic support from private funding (Foundation and others). Some highlights from among these actions are:

- ▶ **Talent attraction.** CEI·MAR will broaden its role as the focus point for the attraction of researcher talent. To achieve its objectives, it will take advantage of the opportunities offered by CEI·MAR institutions in developing a career in research. CEI·MAR has significant assets to advance in this direction, including the quality of the research undertaken within the partnership, the level of excellence of its researchers, its extraordinary available infrastructures and even the surrounding environmental conditions. The incorporation of talent will be especially linked to the strengthening of the human resources for research of the CEI·MAR Network of Research Institutes.

The combination of own funds with the use of specific programmes will provide the economic support for this important line of action. CEI·MAR will pay very special attention to the attraction of researchers who have obtained, within the H2020 work programme of the *European Research Council*



CEI-MAR aggregation holds a network of Research Institutes, with an important role in the future development of CEI-MAR scientific activities

(ERC), a **Starting or Consolidator Grant** in the marine-maritime sector. This is a highly significant investment, which requires suitable conditions. The infrastructures and research groups of excellence, linked to the various research institutes, provide the appropriate scientific environment for this kind of action. Additional funds for the extraordinary provision of resources to make the range on offer attractive will come from our own funds.

On a national level, the combination of own funds with programmes such as the *Ramón y Cajal*, *Juan de la Cierva* or *Talent Hub* programmes will bring not only the continuous incorporation of post-doctorate researchers for periods of 2-3 years (as is the case of the **Atlantis Programme** mentioned previously in the Improving Teaching section), but also other types depending on the development of their scientific careers within **CEI-MAR**. The number of post-doctorate contracts, via Science Law, paid with own funds will be at least 8 per year.

- ▶ **Consolidation and strengthening of the CEI-MAR research institutes network.** The current seven research institutes, belonging to **CEI-MAR** institutions mentioned above, provide services to support the research. The path travelled must be maintained by consolidating relationships and directing their operational methods and objective definitions towards a common goal. The consolidation of this line of action is an immediate proposal.

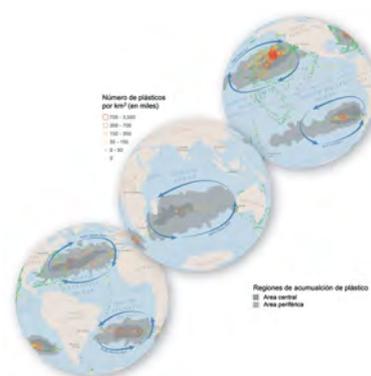
In turn, a short term objective is to transform the **INMAR** Marine Research Institute, as recently approved by the Andalusian Council of Universities (on the 30th of June 2016), into an Inter-institutional Research Institute of the partnership. Similarly, work is currently being undertaken in the humanities field, with the creation of a mixed institute which will bring together all Campus research on history and archaeology maritime and underwater into a single unit.

Another line of action is aimed at getting the **CEI-MAR** Network of Marine Research Institutes defined as a 'Maria de Maetzu' Unit of Excellence. The international productivity and impact indicators of the **CEI-MAR** researchers are sufficient and therefore the fortifying of the Campus research may allow it to enter this competitive call for bids of the Ministry of the Economy and Competitiveness with chance of success.

- ▶ **Encouraging the movement of researchers to European centres of excellence.** The mobility of researchers does not only favour the internationalisation of research, it is an essential part of the progress of knowledge and the strengthening of local scientific communities. The aforementioned Neptune Programme will also contribute in this regard, but special attention will be paid to the needs of researchers-in-training and the needs of researchers who are on the way to consolidating their own lines and teams. To do this, the number of international movements to centres of excellence will be increased by at least forty researchers a year, primarily by financing



CEI-MAR scientists visiting top research centres will be a priority in the mobility strategy and permanent training of the campus



CEI-MAR will follow the leadership of some marine science topics, after successful experiences as the research in microplastics accumulation in the ocean, with publications in impact journals as PNAS, Plos One or Science.

long term stays (three month minimum) in research centres with the *Starting, Consolidator* and *Advance* Grants of the ERC H2020 Programme.

- ▶ **The incorporation of young doctorate qualified students** into strategic lines of marine-maritime research. The number of pre-doctorate contracts will be increased by an average of fourteen per year.
- ▶ **Support for the consolidation of unique lines of research.** This concerns maintaining and reinforcing unique lines of research which began in CEI-MAR due to their intrinsic interest, their marine specialisation, their multi-disciplinary nature and their link to the local area. Worthy of special attention are **lines of research with noteworthy leadership from CEI-MAR researchers** which are getting extraordinary results; publication in high impact journals, such as:
 - ◊ Oceanography applied to emerging problems, which affect the marine environment, such as the accumulation of micro-plastics, invasive species, marine contamination, etc. Thus, in the case of the distribution of micro-plastics in the ocean, is a line which is being published in very high impact journals (PNAS, Plos One, Science), showing the international leadership of our researchers in these matters.

- ◊ Monitoring oceanographic variables in the Gibraltar Strait. A zone of intense hydrodynamics at the centre of CEI-MAR, which was the protagonist of the Environmental Observatory of the Gibraltar Strait (OMEG), endorsed by CEI-MAR.
- ◊ The physiology of marine organisms of interest to aquaculture, including aspects of animal nutrition and wellbeing.
- ◊ Impacts of climate change on the coast and adaption strategies.
- ◊ Maritime and underwater archaeology, including an advisory role in the face of international problems and conflicts. CEI-MAR has attained noteworthy prominence at a national and international level in this field, thanks to the presence in the partnership of institutions which are dedicated to the subject (CAS-IAPH, ARQUA and various universities); the attraction of talent using CEI-MAR own funds; the initiation of the first master's on this subject in Spain; as well as its important presence in the Maritime History and Archaeology doctoral programme.
- ◊ Emerging technologies related to the marine environment, including renewable energies of marine origin, offshore engineering, coastal engineering and innovative developments for the sustainable utilization of marine resources.



- ◇ Comprehensive management of the marine environment, including research on the good environmental status, as required for the implementation of Spanish Marine Strategy and to contribute to the European Marine Strategic Framework Directive.

2. Strengthening the support structures of research and knowledge transfer

CEI-MAR is proposing, in the short term, to improve the research and knowledge transfer specialist support units. The carrying out of national and European research projects, as well as the attraction and performing of collaborative projects with businesses, using contract formulae, requires specialised support units. As indicated in the final progress report, there is currently a specific structure provided by the **CEI-MAR** Foundation. Particularly relevant is the Office of European Projects with a delegation in Brussels.

In terms of the immediate future, this structure is going to consolidate and expand, within the framework of the **CEI-MAR** Foundation, facilitating partnership members' participation in national and European initiatives. This unit will help in the search for partners, in the drawing up of the project proposal as well as its submission to the corresponding financial agency, and in the subsequent management of the project if it is awarded.

Within the **CEI-MAR** Foundation, the **Knowledge Transfer and Innovation Specialist Unit** will be reinforced by increasing the number of specialists so that each one can focus on one of the six main fields of work: Living marine resources, Port management and transport logistics, Shipbuilding and offshore industry, Renewable marine resources, Health and the sea and Blue tourism. This will afford support to the entire partnership whilst paying specialised attention to each field. The work to be undertaken will be primarily focused on the promotion and connection of **CEI-MAR's** scientific and technological abilities through the

inter-relations with businesses, as well as on the encouragement and determination of collaborative projects.

3. Improving scientific infrastructures and equipment

Building on the important achievement of making a Science and Technology central service, with more than 200 outstanding scientific infrastructures for marine research, available to the entire partnership, as outlined through an agreement and catalogue; in the short term, **CEI-MAR** is proposing to keep the catalogue permanently up-to-date and to make its use easy to manage. Another two objectives determine the actions of **CEI-MAR** in this field and in the short term:

- ▶ Among the shared-use facilities, special attention should be paid to the UCADIZ research vessel. The investment made and the scientific value of the UCADIZ vessel, on top of its unique equipment (among which is equipment for underwater archaeology) would make possible the internationalisation of this facility in the short term. This facility is of top scientific and technological quality and in terms of innovation at a national level, it is unique in its category. The objective is to become integrated into the *Unique Scientific and Technical Infrastructures (ICTS)* network of the Ministry of Economy and Competi-



CEI-MAR will enhance the activity of its office in Brussels (located at the Andalusian headquarters) to coordinate our participation in European projects.



tiveness. The UCADIZ vessel will then join the ICTS FLEET which is currently formed of ten oceanographic ships, all of which have technical management and financing from the General Administration of the State and none of which are based in Andalusia. After it joins the fleet, the expeditions will be regulated by the Commission of Coordination and Monitoring of the Activities of Oceanographic Ships (COCSA-BO), thus facilitating its use by all national marine research institutions.

- ▶ In terms of the support resources and infrastructures for innovation, a short-term objective is to **finish the Business Transfer Centre** (section B.7) and to **make it fully functional as a transfer centre of reference** for the partnership and for international projection. This project, which began its life with the request for bids for the works and execution project, entails a total financing of nearly €8.5m.

4. Strengthening the CEI-MAR Innovation Ecosystem

CEI-MAR has managed to initiate a marine-maritime Innovation Ecosystem, resulting in an intense effort to enhance the inter-relationship between Science, Technology and Business, with the participation of all the main players in marine-maritime innovation, with notable international projection and based on trustworthy collaboration relationships, along with formulae



The UCADIZ research vessel will be fundamental to reinforce CEI-MAR oceanographic and subaquatic archaeological research

which outline the work and relations. CEI-MAR's objective is to strengthen and consolidate this ecosystem via various actions:

- ▶ **Incorporation into new large H2020 initiatives: Robotics** (a public-private partnership centred on the strengthening of Europe's position in the robotics industry, a field in which we are particularly interested from the standpoint of its use in the naval industry and underwater robotics) and **ECSEL** (a combined technological initiative concerning embedded computer systems and nanotechnology which could be of special interest to the shipbuilding industry, for example).
- ▶ **The strengthening of the technical support** for researchers involved in work groups in the various H2020 public-private partnerships of which we are a member, whilst incorporating a growing number of young researchers into these meetings.
- ▶ The **strengthening of clusters**, the creation of new ones, the unification of some which are very local or too sector-based; the reinforcement of the **CEI-MAR innovation groups** (with technical support in the **CEI-MAR Transfer and Innovation Specialist Unit**).
- ▶ The **strengthening of company-CEI-MAR networks and meeting spaces**. This particular case concerns increasing the number and territorial area of the **Blue Economy Platform**, in the proper legal manner (the association as collaborators of all the companies that are associated with **CEI-MAR**, within the framework of the **CEI-MAR Foundation**), within the field of our geographical area of influence and international projection, essentially focusing on innovation projects which bring about regional development.
- ▶ The technical support, via the Transfer and Innovation Specialist Unit, of the six **CEI-MAR innovation groups** referred to in section B.3. These groups of researchers, with



CEI-MAR's six innovation clusters will lead research topics in different themes, such as smart tourism, 4^o level food products or robotics for naval industry

participation from businesses, are the true driving force of innovation projects and Blue Growth.

- ▶ The institutionalisation of periodic meetings under the structure of **Innovation Thematic Seminars of the different areas of CEI-MAR and Work Groups within them.**
- ▶ The creation of an **innovation web portal.**
- ▶ The strengthening of the **doctoral theses in businesses programme**, increasing the number of annual pre-doctoral contracts for industrial theses to 10.

5. Strengthening the Entrepreneurial Ecosystem in the marine sector

To do this, special attention will be paid to the following actions:

- ▶ The promotion and support of the creation of technology-based businesses in marine-maritime sectors. In addition to continuing with and consolidating the actions which are being developed (as well as those in the two previous sections), the marine-maritime Business Transfer Centre (CTE) contains, within its design, a space for motivating entrepreneurs. It was conceived from an *open innovation* perspective and it favours the centre housing both agents of innovation and businesses/entrepreneurs. Advancers of knowledge

and entrepreneurs share an environment which favours the exchange of ideas, networking and co-working spaces, among other things. Although the generation of disruptive ideas or innovations can arise from anywhere, the most important aspect is to know how to use them and share them, and the CTE is also designed to play that role, thus promoting the creation of innovative businesses in the marine-maritime sector. This makes this line of work a great opportunity for entrepreneurs and a very powerful tool for encouraging the generation of marine-maritime technology-based businesses.

- ▶ Launching activity based on the agreement with the Official College of Naval Engineers (COIN) cited in section B.6. Independently of the foregoing and supplementary to it, the full development of the project with COIN will provide important support to entrepreneurs, predominantly through the 'Blue Ocean' *Business Angels* Network.
- ▶ The development of an International Ecosystem of Marine Entrepreneurship (the starting point of which is the European Atlantic Programme also mentioned in section B.6 and which, on the 27 September 2016, was the subject of a workshop in Dublin, on the occasion of the 3rd *Atlantic Stakeholder Platform Conference*).



The Business Transfer Center will be the core of the interaction between CEI·MAR and companies in marine-maritime sectors

Future actions in the field of INTERACTION WITH SOCIETY.

In the field of the transformation of the Campus and its interaction with the Society, **CEI·MAR** has already had a notable social influence and is contributing to sustainable socio-economic development based on the knowledge of its territorial surroundings.

One of the fundamental objectives is to contribute both indirectly and directly: indirectly by promoting change in the production model, business innovation and the creation of technology-based businesses; and directly via specific programmes and the generation of employment in marine-maritime economic activities in our geographic area of influence.

The initiated projects are subject to continuity, fortification and consolidation and, in terms of employability; they are part of a large **Plan for Training and Promotion for Employability in the field of the Blue Economy**, which is already being developed (see section C.1). There are four main lines of action for this:

- ▶ The incorporation of graduate, master's and doctorate students into companies in the marine-maritime sector for the realisation of their end-of-course assignments or doctoral theses. This line of work will be encouraged even further, giving it a particular impact on SMEs, via a specific agreement with the Entrepreneurs Confe-

deration of Andalusia (the CEA - a member of the board of trustees) and via alliances with the business sectors of the other two **CEI·MAR** regions.

- ▶ The Training for Employment plan, for transversal skills at university level, according with the current programme.
- ▶ The Plan for the Employability of Graduates with **CEI·MAR** qualifications, in collaboration with the CEA, and with an annual number of 200 work experience contracts on offer for recent **CEI·MAR** graduates.
- ▶ Training and Re-qualification for Employment via the development of the short term 'Diana Blue' Programme. In the medium term, **CEI·MAR** intends to extend this programme throughout the geographical area of influence, once the pilot initiative has been attested.

The dissemination of the Campus's scientific, innovation and general activity is an essential element for connecting with the general public, attracting it to **CEI·MAR** initiatives and for **CEI·MAR** to inter-connect with the reality of the people. This interaction with the surrounding area and the connection with the general public is important for the Campus of Excellence, given that it must be part of the society. In the last five years, there have been numerous dissemination activities carried out by **CEI·MAR** throughout the region in which it is based (see the C sections).

The management and promotion of dissemina-



The CEI-MAR Summer Scientific Campus is a consolidated experience that will travel to other CEIMAR universities in next editions.

tions activities will be outlined through the **CEI-MAR** Foundation, linked with other institutions. Some of the activities which will concentrate our organisational and budgetary efforts are:

- ▶ Relevant events organised by European or national institutions, including 'Researcher Night' and the 'Scientific Summer Campus'. 'Researcher night' is a Europe-wide event which takes place simultaneously in all the cities of Europe. The 'Scientific Summer Campus' is an event organised by the FECYT and it was obtained by **CEI-MAR** for the first time in 2016. Our idea is to request it again in the future but offering the organisation to other **CEI-MAR** universities.
- ▶ To supplement the dissemination works through large events (e.g. *Scientific Sea Fair*) with a continuous public awareness campaign, whether this is for schools (a programme school workshops about the sea) or for the general public (seminars, courses, workshops, etc.).
- ▶ Maintenance and reinforcement of the structures which are derived from **CEI-MAR** and which are most involved in tasks entailing dissemination and connecting with the general public. This especially concerns the Marine Research Laboratory (**LABIMAR**) and the "Aula del Mar" of the University of Granada. Seeing as each of them are in different seas, the Atlantic and



The dissemination strategy of CEI-MAR will consider LABIMAR, "Aula del Mar" or OMEG

the Mediterranean, they must become, with support from the **CEI-MAR** Foundation, the hubs of **CEI-MAR** activity dissemination.

- ▶ The creation of the Maritime History and Underwater Archaeology Laboratory-Museum in the Castle of San Sebastián (Cadiz). With the recent concession of infrastructural aid from the Ministry of the Economy and Competitiveness (MINECO), work has begun on this initiative. Just in front of the **LABIMAR**, there is a space which is currently not in use and advances are being made, chiefly with the Cadiz Council, to prepare it and equip it with content and activities related to one of **CEI-MAR**'s preferred lines of action: underwater archaeology and maritime history. This lab-museum will supplement the more scientific side of the **LABIMAR**, making the Castle of San Sebastián a fundamental hub for **CEI-MAR** to make the public more aware of its marine knowledge.
- ▶ Consolidate the Scientific Culture and Innovation Units (UCC+i) of the **CEI-MAR** institutions. These units are fundamental for the design and execution of dissemination activities. Said UCC+i Units, which come from a university setting, shall remain open to collaboration with PRIs in the area of each University, for the development of these activities.
- ▶ Maintain the visibility of **CEI-MAR** activity



The sustainability commitment of CEI-MAR is illustrated with projects such as "Ecopuertos"

on the net. The **CEI-MAR** website and the social networks (*Facebook, Twitter, etc.*) of both **CEI-MAR** and some of its resulting structures (**EIDEMAR, LABIMAR**, the "Aula del Mar", UCADIZ, etc.) are essential for keeping in constant contact with the end users, students or the general public.

- ▶ Encourage volunteer projects with an environmental aspect that are open to the public. The most emblematic project in which **CEI-MAR** is working is the Ecoports project (see section C.6). This is managed overall by **CEI-MAR** and it has research, volunteering, public awareness and social and solidarity action components. **CEI-MAR** is working on a valid combined proposal for the entire Andalusian coastline and this will have to be implemented in this new period. Additionally, encouraging other volunteers who are dedicated to fields such as 'seawatching' or the recovery of unique locations in the areas around the campus, such as the salt marshes.

Corollary: The future of CEI-MAR

In this last section of the **CEI-MAR** project's final report, we would like to stress the role that this Campus of Excellence has played in the consolidation of marine-maritime knowledge and its projection in terms of excellence in re-

search, innovation, knowledge transfer, connection with the productive sector and connection to the general public. This opinion is validated by the successful actions carried out over the last five years, as detailed in this final report, and also in the eyes of the media, the social agents, the researchers and the specialists who form part of the fourteen **CEI-MAR** member institutions.

The **CEI-MAR** campus activity has taken place against a backdrop of considerable economic crisis. It was a campus which was approved in 2011 and it had to commit to taking action in the worst years of the crisis. Proof of this is the absence of subsequent calls. A further consequence of the economic crisis was that **CEI-MAR** could not obtain funding at the time of its commissioning. It only obtained financing later – €4.8m from the Andalusia Government. Additionally, the southern region of the Iberian Peninsula, in which the **CEI-MAR** institutions carry out their activity, is one of the poorest regions in Europe, with higher unemployment rates and with less development in its business and industrial framework. This is the regional and temporal context and these are the less than favourable conditions in which the **CEI-MAR** campus activity had to take place. The achievements attained, as detailed throughout this report, must be appreciated even more when bearing in mind these surrounding conditions.

The International Campus of Excellence Programme has supposed a revolution in Spanish Universities. We have all participated in its execution, we have seen firsthand the benefits that the programme has had in terms of the encouragement of strategic partnerships around a specific subject (in this case marine-maritime research); in terms of an increase in the critical mass of researchers, thus allowing them to take on greater challenges; and in terms of the synergies and mutual benefits of encouraging collaborative culture. This is why it would be recommendable to continue with the Campus of Excellence policy, so that projects (such



as this one), which have been successful and which have marked a turning point in teaching, research, knowledge transfer and relationships with the environment, get the support to maintain the structures which have required such dedication and which have altered the associated institutions so deeply.

CEI-MAR, as a partnership of research, teaching and marine-maritime services institutions is a clear example of something that is 'more than the sum of its parts'. The sum of the public institutions and businesses which are together in **CEI-MAR** allow them to face problems and challenges which they could not respond to as individual institutions. This is a great asset of **CEI-MAR**, an asset which can be seen in projects such as the "Ecopuertos" project, a **CEI-MAR** initiative which was implemented in all **CEI-MAR** institutions and in all Andalusian fishing development groups. Thanks to its implementation on that scale, it has been accepted by the Andalusian Administration as part of the backbone of all policy concerning fishing ports in this autonomous community.

Following this idea, **CEI-MAR** must become a privileged representative for Ministries, Councils, public administrations and business in the face of problems which may arise in fields related to the sea. This is because this partnership can provide advice and apply the necessary solutions. An example of this is the recent presentation, in **CEI-MAR** facilities in Cadiz, of the Spanish Marine Strategy by representatives of



the Ministry of Agriculture, Nutrition and the Environment (MAGRAMA), with participation from **CEI-MAR** researchers <http://www.magrama.gob.es/es/costas/formacion/talleres-divulgativos-EEMM.aspx>. One of the results of this meeting was the Ministry's recognition of the role that **CEI-MAR** can play in the analysis of the Environment Status which we are obliged to carry out in said strategy. Similarly, the president of the Spanish Oceanographic Institute agreed with that opinion when citing a document that he recently sent to the president of the **CEI-MAR** Foundation, in which it he wrote: "**CEI-MAR** could constitute a very useful scientific-technical instrument for the administrations responsible for defining and implementing the marine-maritime policies which must be produced in Spain in the immediate future, and more particularly those concerning Marine Spatial Planning."

In any case and independently of the future of the CEI Programme, the researchers, specialists, managers and all the staff involved in the institutions participating in **CEI-MAR** are convinced of the integrity of this programme and of the benefits of this partnership. This is why we are going to keep the flame alive via the consolidation of the two main bodies created in **CEI-MAR**: **EIDEMAR**, the International Doctoral School in Marine Studies and the **CEI-MAR** Foundation.

We are aware of the need to create mechanisms to guarantee continuity and the usefulness of a partnership like **CEI-MAR**. These include, among others:

- ▶ Making a detailed plan for the next five



CEI-MAR is becoming a scientific-technical instrument useful to define and implement future marine-maritime policies. In fact, the Spanish Marine Strategy has been discussed recently within the campus



years (a five-year plan) outlined as a Strategic Plan.

- ▶ Proposing an international experts panel, which will help in the drawing up of said plan.
- ▶ Strengthening the sources of finance of **CEI·MAR** to be able to gradually address increasingly ambitious objectives.

We are viewing the immediate future with optimism, not only do we have the institutional vocation and commitment to keep the **CEI·MAR** structures standing, but we have the recently acquired responsibility of presiding the **CEIMARNET** network of Spanish marine campuses. In May of 2016, the University of Cadiz Chancellor started his presidency of the **CEIMARNET** network, and the **CEI·MAR** General Coordinator assumed its technical coordination. This event further forces us to maintain our activities and to broaden the inter-connections we have spent five years working on, both internally between **CEI·MAR** members and between the latter and the other members of the **CEIMARNET** community.

Our future is leading towards strengthening the teaching, scientific and knowledge transfer partnership of universities, public research organisations, public administrations and businesses, as created to enhance the value of the knowledge gained in the marine-maritime sector and its commitment to socio-economic development, public wellbeing and the job creation. This is a partnership which has caused a real transformation in the Campus and, to an ever increasing extent, it must help to resolve the challenges set by the general public. It must do this so as to respond to one of the main Europe-wide objectives of Horizon 2020 in matters of revitalisation and innovation in the marine-maritime sectors.

Our slogan, **the sea that unites us**, will continue to hold true in the future. The sea will continue to unite partnership members, other research and innovation organisations, administrations, businesses and the general public, both in our geographical area and nationwide, Europe-wide and worldwide.



Table I.
Action programs at
evaluatable focus areas

A.
Improving Teaching
and Adapting to the
European Higher
Education Area



SECTION A.1. Enhancing teaching quality

Strategic area	Improving teaching and adapting to the European Higher Education Area
Programme	Enhancing teaching quality
Objectives	To enhance teaching quality and achieve teaching excellence in all CEI-MAR areas of specialisation
	<p>The goals proposed for this inter-university and inter-institutional project are as follows:</p> <ul style="list-style-type: none"> ▶ Adaptation to the European Higher Education Area of undergraduate and postgraduate degrees taught at European CEI-MAR member universities. ▶ Introduction of new undergraduate and postgraduate degree courses. ▶ Design, development and consolidation of specialist courses. ▶ Implementation of a teaching quality assessment system. ▶ Improvement of material resources and specialist laboratories and centres to deliver quality teaching.

INITIAL OBJECTIVES OF THE 2011 PROPOSAL

The initial objectives are those given above.

DESCRIPTION OF WORK ACCOMPLISHED

In accordance with the tasks entrusted to them as institutions of higher education by law and society, the universities and institutions participating in CEI-MAR are committed to the fundamental mission of the public service they provide: to constantly improve teaching quality. This is the objective of the new educational opportunities offered by the Campus of International Excellence, which comprise a series of courses and activities specifically envisaged in the constitution of CEI-MAR in accordance with the needs and possibilities of the partnership. Application of the teaching quality criteria defined by CEI-MAR (specialisation, internationalisation, interdisciplinarity, collaboration between institutions) has made it possible to

transform and consolidate earlier courses delivered at member institutions, which are now fully aligned with Campus strategies. The result is a comprehensive range of courses unique to CEI-MAR and encompassing a coherent suite of subjects, disciplines and specialisations at all levels of higher education (undergraduate degrees, master's degrees, doctorates, research training activities) that fulfil the need in the business sector linked to CEI-MAR for lifelong learning, continuing education and specialisation. This is complemented by Campus outreach and dissemination activities (e.g. conferences, seminars, activities for schools and society).

The Campus of Excellence now offers a new and distinctive educational experience in its areas of specialisation, establishing CEI-MAR as an outstanding and recognised benchmark for specialist training. Such recognition is not limited to the strictly academic world but is equally present in society (which knows of and values CEI-MAR actions, and participates in initiatives), industry (which relies on CEI-MAR, among others, to deliver specialist training, whether for continuing professional development or for ma-



de-to-measure courses on new developments), national and international *research institutions*, and even *political initiatives*. All these aspects will be described below.

As a consequence, **CEI-MAR** has become an essential training resource for national and overseas researchers, companies, institutions and professionals working in the marine and maritime fields in their broadest sense. As a Campus of Excellence, **CEI-MAR**'s educational model encompasses a balanced range of disciplines, subjects, institutions and new technologies aimed at knowledge transfer and transformation of the surrounding community. **CEI-MAR** is the embodiment of educational excellence, delivering high-quality courses to which all partners have contributed and which reflect the quality strategy designed and shared by the entire **CEI-MAR** community. This education is characterised by:

- ▶ its *multidisciplinary nature*, as the Campus of Excellence encompasses all marine and maritime fields, subjects and disciplines;
- ▶ its *interdisciplinary nature*, as the various branches of science coexist in integrated harmony in **CEI-MAR**, facilitating an overview that encourages collaboration among teaching staff, institutions and companies, and helps identify complementary educational approaches and optimise teaching, learning and the application of knowledge;
- ▶ its *inter-institutional nature*, based on the belief that by combining resources, **CEI-MAR** is better placed to meet educational needs than would be each member institution alone, while at the same time acknowledging and leveraging the unique characteristics that distinguish each institution participating in the Campus of Excellence;
- ▶ its *inter-university nature*, not only because of the universities in three countries and spanning two continents (5 Spanish, 1 Portuguese and 1 Moroccan) that

comprise **CEI-MAR**, but also because of the expansion that has defined its strategy of alliances (nationally: agreements with other similarly themed campuses of excellence in Spain; and internationally: agreements with prestigious universities on both sides of the Atlantic, where **CEI-MAR** has assumed leadership of international research networks among other activities);

- ▶ its *international vocation*, in the broadest sense, since **CEI-MAR** has not limited its scope and influence to the original partnership members (located in the southern Iberian Peninsula - Spain and Portugal - and northern Africa -Morocco), but has also forged alliances with overseas universities, research institutions, consortia and even governments, to provide specialist training wherever there is a need for a comprehensive, integrated vision of marine-themed disciplines.

CEI-MAR currently offers a suite of courses that fully and satisfactorily meet the educational needs of students (at different levels), professionals and companies. This is largely due to the qualified, specialist teaching base **CEI-MAR** has created, capable of responding effectively to the needs of the local population and business community.

From the perspective of a Campus of Excellence, **CEI-MAR** has designed its unique educational programme in accordance with guidelines on equivalence and qualification as defined by the *European Higher Education Area* (EHEA) and, in its foremost field (doctoral programmes and research training), the *European Research Area* (ERA). The principles underpinning **CEI-MAR** have also driven this process of adaptation. **CEI-MAR** has thus guided and promoted a thorough review of degree courses which has encompassed the design, adaptation and regulation of officially recognised **CEI-MAR** courses and the provision of infrastructures and teaching staff in centres and classrooms. All the



Marine Sciences doctorate students participate in a work session on-board the Hesperides vessel

above has been conducted with an emphasis on innovation in educational methods. These actions have benefitted undergraduate and master's degree students alike, and have contributed to enhancing *research training* for students embarking upon or pursuing doctoral studies pursuant to Royal Decree 99/2011, of 28 January, regulating officially recognised doctoral studies in Spain. This decree has been pivotal for the development of CEI-MAR because it provides an integrated overview of undergraduate, master's and doctoral degree courses, complemented by continuing education programmes offered at university. The proximity between promulgation of the decree and the launch of the Campus of International Excellence of the Sea opened a *legislative route* to devising and establishing *ex novo* the EIDEMAR International Doctoral School in Marine Studies (see Section A.5.), and identifying academic and research content suited to its goals and missions.

The work carried out in this area is complex (although at the same time comprehensive and integrated), as it encompasses all the university education levels defined by the EHEA: undergraduate, master's and doctoral degrees, and also includes continuing education (see Section A.2., with reference to the *International Summer School*). *First*, these measures must address the nature of actions requiring the revision of officially recognised courses, subject to quality assessment criteria established in the European framework and adopted by external, indepen-

dent assessment agencies (in the case of the Andalusian university system, the *Andalusian Agency of Knowledge*, through the *Assessment and Accreditation Directorate*; <http://deva.aac.es/?id=deva>). *Second*, this process is rendered more complex still by the need to respect the legal and academic powers (the *university autonomy*) of each of the five Spanish universities that comprise the CEI-MAR partnership (based in the provinces of the autonomous region of Andalusia: Almeria, Cadiz, Granada, Huelva and Malaga), while defining a new academic structure that stretches from east to west in the region and includes the entire diversity of coastal Andalusia and its maritime activities. The universities have adapted their autonomy to the opportunities offered by the CEI-MAR partnership, leveraging the experience and possibilities provided by the Campus of Excellence to meet their local mission with better prospects and results. In addition, the criteria of the Portuguese and Moroccan university model (through the universities of the Algarve and Abdelmalek Es-sadi) have enriched the national Spanish model, while these institutions have adopted those of CEI-MAR. The programmes offered by each university have thus been enhanced by the adoption of CEI-MAR criteria. *Third* and lastly, when appropriate, the process has incorporated the suggestions and experiences of other CEI-MAR member institutions, transforming highly experienced and qualified external agents (e.g. the Spanish Royal Naval Observatory, the Naval Hydrographic Institute, the Spanish Institute of



Oceanography, the Spanish National Research Council and the Centre for Underwater Archaeology) into key players when proposing and programming university courses. Note that these institutions (together with private companies) form part of the CEI-MAR partnership, having become members of the Board of the Foundation responsible for Campus of Excellence governance, and evidencing a strong commitment to work for and contribute their experience and resources to the Campus of Excellence.

Within the framework summarised above, the first CEI-MAR programme of action has been directed towards consolidating the specialist courses delivered by Campus member universities, contributing to and promoting improvement in the quality indicators for officially recognised degree courses. CEI-MAR has sought to achieve academic excellence in the course programmes (proposal, design and regulation, as reflected in official reports of the degree programmes and in dissemination activities) and in the design and practice of the associated teaching that has been delivered over the course of the Campus's existence. Particular attention has been paid to the education received by CEI-MAR institution students. As a result, the teaching and educational activities that define CEI-MAR institutions (and thereby, the Campus itself) have been markedly strengthened to reflect the excellence that defines and is transmitted by the Campus of Excellence.

In parallel with the day-to-day work of each university, the partnership has driven various additional initiatives between 2012 and 2016 with the aim of enhancing inter-university and inter-institutional CEI-MAR teaching to strengthen the Campus and attract teaching talent. In consequence, specialists from various institutions, including PRI members of CEI-MAR as well as national and overseas institutions with whom links have been established, now participate in delivering Campus educational activities. Much of this work has been directed towards the EIDEMAR International Doctoral

School in Marine Studies on the one hand (Section A.5.), and towards specific teaching activities on the other. These will be described below and in the corresponding sections indicated.

The teaching improvements undertaken have not been strictly limited to university classroom activities. Among other actions, the goal of increasing the visibility of CEI-MAR activity in all facets of society has entailed delivery of expert courses, seasonal courses and highly specialised seminars. Similarly, CEI-MAR's commitment to the region's economy and industry has required the provision of a specialised education tailored to meet the professional needs of experts. Therefore, the continuing education offered by CEI-MAR institutions has also been affected (and benefitted) by the educational improvements that have been achieved in officially recognised degree courses. It should be highlighted that all 14 members of the partnership (universities and other institutions) have participated in both the design and the delivery of courses, often collectively, involving members from several institutions.

In 2011, the year that the Campus of International Excellence was presented to the International Commission, the European universities participating in the initiative were immersed in the complex process of adapting their courses to the requirements of the EHEA. Those premises were expressly incorporated into the initial CEI-MAR project and implemented over the subsequent years. To conclude this arduous process and in order to offer to students quality teaching spaces, a specialised education and the best ICT support resources possible, the universities have invested many of their own human and material resources, and in the field of marine and maritime studies, a common adaptation strategy has been designed in order to achieve homogeneous results that contribute to the consolidation of CEI-MAR. Thus, in addition to the global strategy of each institution, the Campus of Excellence has enabled some universities to obtain and deploy special funds within the fra-



mework of the "Enhancement Sub-Programme" envisaged in the CIE grants and mentioned in the approved proposal. These funds have permitted CEI-MAR to ensure that all members of the partnership participate in these actions, according to the resources and possibilities offered by the Campus of International Excellence and the principles underpinning CEI-MAR.

In terms of the curriculum guidelines issued by quality assessment agencies, all member universities have developed their own systems for evaluating the competencies taught on degree courses, for conducting surveys among students and teaching staff and for monitoring management, etc., all in compliance with the criteria and procedures established by the competent regional, national and European assessment agencies. Although monitoring quality in this sense only applies to the officially recognised degree courses taught at the universities, in accordance with the applicable regulations (basically Royal Decree 1393/2007, of 29 October, *establishing the system of officially recognised university degree courses*), each institution's quality system is applied to all the courses they deliver, and consequently to all those offered in collaboration with other CEI-MAR institutions within the framework of *collaborative teaching*, including continuing education, specialisation courses and internal courses. Thus, the quality assurance systems employed by CEI-MAR member universities apply to all the courses taught within the framework of the Campus of Excellence. In sum, under the auspices of the Campus of Excellence, this 'individual' effort on the part of each university has not only enhanced the courses offered by that institution, but has also benefitted the other member universities. The launch of new undergraduate and postgraduate (master's and doctoral) degrees, in line with each individual university's teaching and research strategy and that of the Campus, has created a synergy of efforts and results. As an example, suffice it to say that some of the degree courses *linked* to master's degrees (in particular, Oceanography) specific to CEI-MAR

were reviewed as part of the specialisation strategy, and this has led to joint delivery of a course (the master's degree cited) between three marine-themed campuses of excellence in Spain (more details on this course will be given later). Similar strategies have been applied to doctoral and continuing education programmes. This has made it possible to define, specialise, enrich and validate the courses offered by the CEI-MAR partnership.

The quality assurance systems implemented by the Andalusian universities belonging to CEI-MAR have been developed in line with European quality assessment agencies according to the guidelines of the *European Network for Quality Assurance in Higher Education* (ENQA), guaranteeing compliance with the international model of quality assessment. CEI-MAR degree courses are thus subject to the verification, implementation and quality accreditation procedures envisaged in the abovementioned protocols. The quality accreditation systems implemented by CEI-MAR universities, fully adapted to the requirements of the European Higher Education Area in accordance with the protocols established by the competent quality assessment agencies (in line with European standards), can be consulted by clicking on the following links:

- ▶ The University of Almeria: <http://cms.ual.es/UAL/estudios/masteres/calidad/MASTER7034>
- ▶ University of Cadiz: <https://sgc.uca.es>
- ▶ University of Granada: <http://calidad.ugr.es/>
- ▶ The University of Huelva: http://www.uhu.es/unidad_calidad/sgc/index.htm
- ▶ University of Malaga: <http://www2.isa.uma.es/C19/C7/sistemagarantia/default.aspx>
- ▶ University of the Algarve: <http://goo.gl/ukjtv>
- ▶ Abdelmalek Essadi University: <http://goo.gl/3Ke68e>

Although a full description will be given throughout this and the following sections of all the



qualifications at all levels offered through **CEI-MAR**, by way of example a description will be given here of new degree courses designed around the areas of specialisation that define the Campus of Excellence and which will be launched in the 2016-2017 academic year. It should be borne in mind that preparation of these courses, requiring a meticulous report prior to verification by the competent quality assessment agency, began two years ago. In accordance with the guidelines and protocols of the competent quality assessment agency, prior to implementation these courses have been found to meet the level of quality required, an essential precondition for their delivery by the universities. Thus, the number of degree courses offered by **CEI-MAR** will be increased this academic year by the addition of the following specialist, officially recognised degrees:

- ▶ Master's Degree in Nautical and Underwater Archaeology (Section A.5.) (<https://goo.gl/C1QIST>).
- ▶ Master's Degree in Naval and Oceanic Engineering (<https://goo.gl/k4gGEy>); this degree qualifies the holder to exercise the profession of Naval engineer.
- ▶ Master's Degree in Maritime Transport (<https://goo.gl/XJlodQ>); this degree qualifies the holder to exercise the profession of Captain (Commander) of the Merchant Navy, Chief Engineer on ships and Electronics Engineer.

These will be in addition to the other officially recognised master's and doctoral degree courses offered by **CEI-MAR** through its member universities. A complete list of degree courses and their academic content is available on the **CEI-MAR** web page (<http://goo.gl/pPRBv0>).

Periodically, those responsible for academic affairs at the universities, together with the Campus of Excellence coordinators where appropriate, have held meetings (face-to-face and online) to define the map of **CEI-MAR** degree courses. The process has been extremely complex, as it has consisted of organising the courses offered at each university, which to a large extent have corresponded to a strategy designed several years ago by each institution. Nevertheless, a common, organised strategy has been defined, the result of seamlessly integrating the separate strategies of each institution. The aim was for each university to make an individual contribution, not in order to establish competition over courses but rather to endow the partnership with specialist degrees, and to define common strategies, share resources and offer joint specialisations between universities so that a specialisation could benefit students from other universities and centres rather than being restricted to one university alone. In short, within this new framework, all **CEI-MAR** students have benefitted from the experiences of other Campus of Excellence universities, enriching their education with the diversity bestowed by each university.



CEI-MAR delivered specialised training in all fields related to marine-maritime studies such as Masters on "Underwater Archaeology", "Maritime Transport" and "Shipping and Oceanic Engineering"



The final result of this work has been the suite of degree courses offered by CEI·MAR, discussed later in this Section, which comprises over 200 certified specialist degree courses. This catalogue is the fruit of the educational experience, means and resources contributed, as well the review of courses in accordance with the CEI·MAR model. This has made it possible to tailor the marine- and maritime-themed courses offered to the demands and opportunities of a unique Campus, using common criteria. It is for this reason that the universities have formed a positive opinion of the benefits and opportunities that participation in the educational activities of a Campus of Excellence has brought to their own courses.

The catalogue of CEI·MAR degree courses is continuously updated and is available on the Campus web page (<http://goo.gl/LBabzl>). As an indication of the continuous enrichment of the courses offered, in the terms indicated in the preceding paragraphs, CEI·MAR has recently begun to offer master's degrees in Nautical and Underwater Archaeology, Naval and Oceanic Engineering and Maritime Transport, some of which qualify the holder to exercise a regulated profession. These three degrees have been designed in accordance with the academic and specialist perspective that defines CEI·MAR, leveraging the opportunities and technologies offered by the Campus of Excellence. Thus, the academic reports on these officially recognised degree courses, now approved by the competent quality assessment agency, expressly refer to CEI·MAR degree courses that qualify for entry onto a master's degree (duly classified, where appropriate), use of specifically tailored educational facilities and spaces (establishing alliances between university centres to deliver the best possible education; for example, between the EIDEMAR International Doctoral School in Marine Studies (Section A.5.) and the Faculty of Philosophy) and use of the UCADIZ oceanographic ship, at the full disposal of CEI·MAR (Section B.7.) and whose expeditions and turns for use have been scheduled to meet the needs of Campus of Excellence degree courses

(these master's degrees, Oceanography, and other educational activities for students of marine-themed degrees doing practicals). In past years, the specialist courses have been supplemented by new degree courses, some of which have qualified the holder to exercise a regulated profession, such as the master's degree in Civil Engineering (Roads, Canals and Ports) introduced the last academic year, which leads to the regulated profession of roads, canals and ports engineer (Order CIN/309/2009, of 9 February) and forms part of the CEI·MAR specialist education area of *marine engineering* (<http://goo.gl/X22HG7>).

The academic courses available are thus increasingly consolidated and coherent, including each level of education (undergraduate, master's and doctoral degrees) separately, but also comprising an **integrated** catalogue in two ways:

- ▶ *Inter-institutional*, because through their courses, each institution seeks to complement those offered globally by the Campus of Excellence; thus, CEI·MAR offers an attractive, distinctive range of courses enriched by those that each of the CEI·MAR institutions continue to offer individually but now in coordination.
- ▶ *Academic*, since the education on offer not only encompasses all levels (officially recognised undergraduate, master's and doctoral degrees, as well as internal courses such as expert or continuing education courses), but is also *systematic*, in that the undergraduate degrees qualify for entry onto the master's degrees, and these in turn qualify for entry onto doctoral degrees, providing research training, while continuing specialist education is required by students at all the levels, as well as by teaching staff, researchers, professionals and society in general.

Thus, CEI·MAR offers an integrated, consistent, coherent and consolidated but nevertheless dynamic range of courses.



Their value is evidenced by the national and international regard in which CEI·MAR is held. Further details will be given in the following pages, but for now suffice it to say that the suite of courses offered by CEI·MAR has transformed the University of Cadiz, the institution responsible for coordinating the Campus of Excellence, into a benchmark in international education for various institutions and countries. These include Ecuador and the Ecuador Institute of Oceanography (INOCAR), to which training at all levels will be provided for managerial staff (<http://goo.gl/koo2vE>). The University of Cadiz, and consequently CEI·MAR, has become a major provider and organiser of specialist courses, and has even organised a course in one of the most unique places on the planet: the Galapagos Islands (<http://goo.gl/l2qksx>, <https://goo.gl/nUvmtw>). Similarly, CEI·MAR has become an important partner of the National Autonomous University of Mexico, cited several times in this Section, in specialist areas such as underwater archaeology (<http://goo.gl/QpQOVt>). These highlights will be discussed in more detail below.

The officially recognised degree courses offered by the Campus of Excellence are complemented by thematic courses intended to provide specialist training, to attract talent (from undergraduate and master's degree students through expert courses to researchers in training on the doctoral programmes offered by the International Doctoral School) and to consolidate international short courses for which CEI·MAR is internationally renowned. Foremost among the educational activities designed as part of CEI·MAR's internationalisation strategy are EIDEMAR's specialist courses and CEI·MAR's *International Summer School* courses, taught in English. The Summer School has already been held three times, in 2014, 2015 and 2016 (for more details, see Section A.2.).

A recent creation, EIDEMAR is an international doctoral school and research centre fully compliant with the latest legislation regulating such centres in Spain (Royal Decree 99/2011, of 28

January, regulating officially recognised doctoral education). It was conceived in line with models of similar European institutions and with the organisational rigour of CEI·MAR's neighbouring countries. EIDEMAR is the focal point for all of the Campus of Excellence's doctoral activities, and by extension, for all educational activities required by legislation on doctoral programmes, as it is for CEI·MAR's officially recognised master's degrees.

EIDEMAR was specifically created to be the Campus of Excellence's centre for doctoral studies, and its conception and daily and strategic management has involved member universities from Spain, Portugal (the University of the Algarve) and Morocco (the Abdelmalek Essaadi University). EIDEMAR was conceived as (and has become) the focal point of the Campus of International Excellence of the Sea. The International Doctoral School delivers CEI·MAR's doctoral programmes (including an Erasmus Mundus programme), officially recognised master's degrees and training activities associated with the doctoral programmes, and organises seminars, study days and conferences. EIDEMAR also plays an important role in research (e.g. organising predoctoral recruitment of researchers in training with companies, to prepare their doctoral theses), in international dissemination (e.g. the *International Summer School*), in collaboration with other universities abroad (e.g. agreements have been reached with the University of Ferrara, the National Autonomous of University Mexico and several Russian universities and institutes for joint delivery and award of master's degrees and doctoral programmes), and in the design of specific training activities for overseas institutions and governments.

Besides coordinating officially recognised master's degree courses and doctoral programmes, EIDEMAR has also approved and delivered a comprehensive suite of specialist courses, including courses taught in English that have been offered without interruption since the 2013-2014 academic year. Researchers from



all Campus partnership member institutions as well as overseas experts have participated in the delivery of these courses, which are of an extremely varied nature, content and length (link to courses: <http://goo.gl/QZX7Zm>). A detailed description of these courses is given in Section A.5.

However, **CEI-MAR's** strategy goes beyond its own Campus members and region, via the **CEIMARNET** network (for further details, see Section B.1.). This network was created at the initiative of the **marine-themed Campuses of International Excellence** in Spain to enable them to collaborate on national strategies. Thus, **CEIMARNET** incorporates and coordinates the actions and opportunities that each offers. The participant campuses are as follows:

- ▶ CIE Do Mar (Galicia and northern Portugal); <http://bit.ly/2dd5CWy>.
- ▶ CIE Canary Islands Atlantic Tricontinental (Canary Islands); <http://bit.ly/2dah3vy>.
- ▶ CIE Mare Nostrum (Murcia); <http://bit.ly/2cSHJ6a>.
- ▶ **CEI-MAR** (Andalusia, southern Portugal and northern Morocco).

The **CEIMARNET** network was created in January 2012 to coordinate collaboration between these campuses of excellence with the aim of improving the quality of their scientific, educational, transfer and dissemination actions. In line with

these objectives, and particularly with the educational objectives, the coordinated action of the four campuses of excellence (which encompass 14 universities and numerous public, regional, national and international agencies) has enabled identification of the need and opportunity to review the academic content of some of the emblematic marine-themed master's degrees delivered by the universities and to design of new ones based on campus collaboration facilitated by **CEIMARNET**. The inter-university master's degrees facilitated by the network thus benefit from the excellence contributed by each Campus, and work is ongoing to extend this quality education. Network members have thus shared educational experiences and techniques, innovation opportunities, students, teaching staff and resources (all discussed separately in the corresponding report sections), making it possible to design degree courses in line with the experiences and opportunities offered by each Campus specialisation and to promote mobility. This is the scenario of opportunities provided by **CEIMARNET**. The goal of **CEIMARNET** actions is to create new master's degrees in accordance with these concepts, offering a specialist education for students and professionals by leveraging the opportunities available at all marine-themed Spanish campuses. This requires a complex process of academic coordination, since it involves not only addressing and meeting the specialist needs of each course, but also complying with the co-



Picture of the **CEIMARNET** Presidents' meetings at the University of Las Palmas de Gran Canaria (left) and Madrid (right). In the latter, the **CEI-MAR** Foundation president takes over the network presidency



responding quality and accreditation protocols established by the EHEA, implemented in Spain by the quality assessment agency ANECA.

The possibilities offered by this initiative, which has already produced results, is coordinated through inter-campus committees composed of specialist teaching staff and those responsible for academic affairs at each university. The first such *inter-campus* master's degree to be thus approved has been the *inter-university master's degree in Oceanography*, which is taught at three campuses of excellence: the Campus do Mar, the TriContinental Campus and CEI-MAR. At the time this report was written, this officially recognised degree had successfully been delivered in its entirety at the corresponding universities and campuses in the 2015-2016 academic year (<https://goo.gl/TVAkzY>). Its design is a perfect example of an inter-university master's degree, having a core module common to the three campuses and three specialist areas reflecting the strengths of each: (I) Open-ocean processes - Canary Islands Tricontinental CEIR; (II) Ocean and climate - CEIR Do Mar (Galicia and northern Portugal); and (III) Coastal oceanography, CEI-MAR (Andalusia and southern Portugal) (RUCT, code 4315102). Pursuant to the agreements adopted in meetings between the campuses, four inter-university master's degrees have been proposed: "Oceanography", "Fisheries Management", "Aquaculture" and "Integrated Management of Coastal Areas". Click on the following links for further information:

- ▶ University of Cadiz, <http://goo.gl/U06R3q>;
- ▶ University of Las Palmas, <http://goo.gl/PGR9Jr>;
- ▶ University of Vigo, <http://goo.gl/FZJsB1>;

The working method adopted will be applied equally to other degree courses being designed (*Fisheries management*, *Underwater Technologies* and *Integrated Management of Coastal Areas*; this latter has been led by CEI-MAR). CEI-MAR coordinates the CEIMARNET Master's Degree Committee, and shall expressly ensure

that this model is extended not only to officially recognised master's degrees, but also to other specialist degree courses that could be delivered jointly by the participating universities and to doctoral programmes that enhance the research training offered by the four CEIMARNET member campuses.

CEI-MAR's ongoing academic commitment to CEIMARNET and to the model of collaboration and expansion this network represents is evidenced by the recent appointment of the vice-chancellor of the University of Cadiz, the university responsible for coordinating CEI-MAR, who is also the president of the CEI-MAR Foundation, as President of the Governing Council of CEIMARNET (<http://goo.gl/I6P1g2>). This illustrates not only the satisfaction of the members of the four campuses of excellence with the results obtained by this collaboration, but also recognition of CEI-MAR's capacity to lead and promote the network.

CEI-MAR's model of extending and expanding educational activities goes beyond academic coordination with partnership institutions or alliances with other institutions and neighbouring campuses of excellence. An international perspective is the hallmark of all CEI-MAR actions; relations with overseas universities and other institutions are thus strategic aspects of our Campus of Excellence. The international expansion of CEI-MAR therefore encompasses not only *natural* geographical areas of academic collaboration (Europe and northern Africa being the regions expressly referred to in the initial CEI-MAR project), but also *strategic* areas: the post-Soviet space, North America and the Ibero-American Knowledge Space. Although further details are given in Sections A.2. and A.6., a summary shall be given here of the most important achievements with respect to CEI-MAR's internationalisation strategy as it refers to education in the abovementioned areas.

Of particular note among the postgraduate courses delivered in coordination with other European universities are the master's degrees



and doctoral programmes created within the framework of the Erasmus Mundus programme (<http://goo.gl/mp0BtW>). CEI-MAR is involved in the following:

- ▶ Inter-university Erasmus Mundus Master's Degree in Water and Coastal Management (WACOMA), coordinated by the University of Cadiz (responsible for coordinating CEI-MAR) and involving Ningbo University (China), the Russian State Hydrometeorological University (RSHU), the University of Santa Cecilia (Brazil), the University of the Algarve (Portugal) and the University of Bologna (Italy). The two-year course is taught entirely in English and is worth 120 ECTS credits (two years) in a specialist area. Click on this link to view the course web page <http://goo.gl/4eOBM8>.
- ▶ The European Joint Master in Quality in Analytical Laboratories, 2016-17, coordinated by the University of Barcelona, and involving the University of Cadiz, the University of the Algarve (Portugal), the University of Bergen (Norway) and the University of Gdansk (Poland), as well as the Central South University (China), the Novosibirsk State University (Russian Federation) and the University of São Paulo (Brazil). Click on these links to view the course web page <http://www.emqal.org/>, and the University of Cadiz web page <http://goo.gl/XY8AoC>.
- ▶ Master's Degree in Integrated Management of Coastal Areas (GIAL), 2016-2017. Designed *ad hoc* and recently reviewed in accordance with CEI-MAR criteria, this degree is delivered and awarded in conjunction with the University of Ferrara (Italy), in line with a recently renewed Collaboration Agreement between the two universities [link *]. The comprehensive curriculum coordinated by the two institutions allows students to simultaneously obtain a double degree; the master's degree in Integrated Management of Coastal Areas and the

Laurea Magistrale in Scienze Geologiche, Georisorse e Territorio. Students who opt to study abroad can apply for Erasmus mobility grants (<http://goo.gl/yX9GNI>), specifically designated for this degree course. In recognition of the long-standing, consolidated relationship between the two institutions, CEI-MAR has awarded the University of Ferrara the CEI-MAR seal of excellence (see Section A.2. for more details), thus strengthening existing collaboration in the areas of specialist education and officially recognised master's degrees and promoting the design of new courses, such as that described below.

- ▶ Doctoral programme in Marine Sciences and Technology at the University of Cadiz, affiliated to the EIDEMAR International Doctoral School in Marine Studies (Section A.5.) in conjunction with the doctoral programme in Earth & Marine Sciences (EMAS) at the University of Ferrara, 2016-17, which is taught in Spanish, English and Portuguese. The specific design of doctoral programmes in collaboration with other universities (in this case, with the University of Ferrara) for incorporation in the Erasmus Mundus programme lifts the CEI-MAR strategy for inter-university collaboration on doctoral programmes beyond mere co-supervision of doctoral theses by researchers at two different universities. The programme incorporates interdisciplinary scientific and technological aspects of the ocean, in a broad sense (see Section A.5. for further details), and over 80 highly qualified teaching staff from more than 20 Spanish and overseas universities and centres are involved in its delivery (<https://goo.gl/t24Nf7>).

CEI-MAR has implemented a strategy of academic and research expansion at master's degree, doctoral programme and specialist course level in Russia and the post-Soviet space. These activities leverage the renown, experience and



consolidated position that the Hispanic-Russian University Classroom at the University of Cadiz enjoys in these regions (<http://www.auhr.es/es/>). There is a long-standing relationship between several Russian universities and the University of Cadiz and CEI-MAR. Various Russian institutions have signed academic collaboration agreements; similarly, several institutions signed statements of support for the initial CEI-MAR proposal in 2011, including the Southern Federal University, the Siberian Federal University, the Russian State Hydrometeorological University and the Institute of Oceanology of the Russian Academy of Sciences. These relationships are not limited to general agreements or statements of intentions and support, but contemplate specific actions concerning double master's degrees, co-supervision of doctoral theses (described in detail in Section A.6.), Erasmus+ mobility projects and R&D projects (discussed below and in more detail in Section A.2.).

Notable among the educational actions of the Hispanic-Russian University Classroom in relation to CEI-MAR are the following:

- ▶ Double degree agreement with the Russian State Hydrometeorological University, regarding the master's degrees in *Oceanography and Integrated Management of Coastal Areas* taught at the University of Cadiz and the master's degrees in *Physical Oceanography, Fisheries Oceanography and Marine Activity and Integrated Management of Coastal Areas* taught at the Faculty of Oceanography at the RSHU. The double degree is worth 120 ECTS credits (2 years). The agreement was signed in the 2014-15 academic year and was launched in 2015-16. Student mobility will be funded via bilateral Erasmus+ KA107 agreements between the UCA and the RSHU, and funding will also be provided by each of the two universities.
- ▶ An international specialist course in Environment and Global Change, in collabo-

ration with the Siberian Federal University, funded by CEI-MAR and the Santander Bank Chair in Environmental Studies (link to CEI-MAR news <http://goo.gl/qLVSI>).

CEI-MAR's internationalisation strategy for education has been strengthened in Ibero-America by the delivery of several international seminars taught by Campus specialists (Section A.2.). These have included a course entitled "Coastal Hazards and Vulnerability", delivered within the framework of the UCA's seasonal courses at the request of the Autonomous University of Mexico and the University of Tabasco, with high attendance of teaching staff from these universities. In addition to attending the course, these staff have established strong links with the universities and their research groups, identifying future actions such as the design of postgraduate courses or potential research projects, as well as establishing a timetable for action.

Within this framework of Ibero-American relations, a *Doctoral Training Programme in Marine Sciences* has been designed for delivery in November 2016. Falling within the framework of CEI-MAR doctoral studies at the University of Cadiz, through EIDEMAR and together with the Ibero-American University Postgraduate Association (AUIP), this initiative will coordinate doctoral training at the Eloy Alfaro de Ma-nabí University and the Simón Bolívar University (and through them, at other universities in



Elisa Martí, Marina Bolado and Iria Sala, students in the EIDEMAR "Marine Sciences and Technologies" Doctorate Programme on-board the "Sarmiento de Gamboa" vessel during the MEGAN expedition



Ecuador and Colombia) (<http://www.auiop.org/es/>; see also Sections A.2. and A.6.). The programme consists of delivering an *introductory course on marine research*, to select the best researchers from Ibero-American universities for access to the doctoral programmes offered by **EIDEMAR**. Through the AUIP, selected students will be awarded grants to fund research placements in Spain at any **CEI-MAR** institution. Proof of the strength of the relationships that **CEI-MAR** has established with its sibling continent is that **CEI-MAR** has recently been assigned Presidency of this prestigious association, through the vice-chancellor of the university responsible for coordinating the Campus (<http://goo.gl/HRahTc>).

In the Ibero-American Knowledge Space, **CEI-MAR** has, since its constitution, endowed the Ibero-American network of integrated coastal management (**IBERMAR**) with new perspectives and approaches (<http://www.gestioncostera.es/ibermar/>). This is an expert international collaboration initiative, initially sponsored through the Ibero-American Science and Technology for Development Programme (CYTED), which brings together more than 200 researchers and managers from 16 different countries (Mexico, Panama, Cuba, Colombia, Brazil, Chile, Argentina, Portugal and Spain, as founder members; and Uruguay, Costa Rica, the Dominican Republic, Puerto Rico, Honduras, Ecuador, Peru and Venezuela, as associate members). Headed until recently by the coordinating university of **CEI-MAR**, the network promotes compliance with the global and regional commitments adopted by various countries in relation to the Ibero-American coastal space and use of its abiotic resources and biodiversity, and is aimed at establishing a system of management based on sustainability. Thus, **IBERMAR** promotes closer relations between science and decision making, reducing the gulf that has traditionally existed between scientific knowledge and the integrated (ecological, socioeconomic and cultural) public management of coastal and marine affairs. Notable among the educational activi-

ties achieved as the result of collaboration are the following:

- ▶ The 1st Ibero-American congress on integrated management of coastal areas, entitled *Improving management of Ibero-American coastal areas*, held in Cadiz in January 2012 (<http://goo.gl/pVhXzu>).
- ▶ **IBERMAR-LOCALMIC** Roundtable: "*Experiences of local integrated coastal management in Ibero-America (LOCALMIC)*", held in Punta del Este, Uruguay, in October 2013 (<http://goo.gl/qAu8VQ>).
- ▶ Symposium: "*Integrated management of coastal and marine areas in Ibero-America. Experiences and challenges*", held in Santa Marta, Colombia, in October 2015 (<http://goo.gl/NQx4t1>).
- ▶ 2nd Ibero-American congress on integrated management of coastal areas, entitled "*Governance of coastal and ocean ecosystem services*", held in Florianópolis, Brazil, in May 2016 (<http://goo.gl/YMd2hF>).

CEI-MAR institutions and PRIs collaborate and participate in delivery of officially recognised degree courses, under the terms expressly stated in the degree course report. Thus, they deliver lectures and workshops on undergraduate degrees and specialisation modules on various master's degrees, supervise final year projects on undergraduate and master's degrees, give lectures, seminars and workshops in various forums and deliver specialist courses and educational activities on **EIDEMAR** doctoral programmes. Since these activities are regulated and annual, they will not all be discussed here, but in the corresponding officially recognised degree course sections. However, it is worth highlighting the improvement to teaching achieved by enriching the academic experience in classrooms through the participation of professionals from other institutions, ensuring an education that more closely reflects practical experience and, often, the demands of companies in the sector.



As regards complementary education (continuing education and specialist courses), in 2013-2014 and 2015-2016, CEI·MAR institutions actively collaborated in the delivery of specialist Campus courses, whether in coordination with several other institutions or by inviting experts from the various CEI·MAR institutions to participate on their courses. Of particular note in this context has been the involvement of the University of Malaga in the launch of new expert courses offered by CEI·MAR.

These courses have been widely disseminated through CEI·MAR channels and many of them offer grants for university and vocational students. The complete catalogue is available on the intranet of the web page. Some of the most relevant of these offered by each institution, whether because of the subject matter or because they have been entirely funded by CEI·MAR, are listed below.

For example, EIDEMAR has organised the following *International Summer School* courses (<http://goo.gl/y31q2U>).

- ▶ Estuarine and nearshore systems: from fundamentals to cutting-edge knowledge (5 June – 17 June, 2016. Granada, Spain) (<http://gdfa.ugr.es/summerschool16/>).
- ▶ University of the Algarve: third Ocean Technology Summer School, 13 to 17 June 2016 (<http://www.ocean-technology.org>).
- ▶ Aquaculture in southern Europe: basic and applied aspects (<http://goo.gl/mi0wPi>).
- ▶ Effective communication skills for scientists (<http://goo.gl/SIKlig>).
- ▶ International crisis, the European Union and the Mediterranean (<http://goo.gl/CXiYYf>).
- ▶ Introduction to naval artillery and its historical meaning (<http://goo.gl/y4RDCI>).
- ▶ Remotely piloted aircraft system as a tool for research in natural Sciences (<http://goo.gl/fXKpDr>).
- ▶ Applied oceanography and integrated ma-

agement of coastal areas in the Galapagos (<http://goo.gl/A7Tucv>).

In relation to previous *International Summer Schools* (2014-2015), the following courses were offered:

- ▶ The amazing world of seaweeds: an unforgettable journey from biology to gastronomy.
- ▶ Marine toxicology – how our pollution is killing marine life!
- ▶ Origin and development of naval architecture
- ▶ Aquaculture in southern Europe: basic and applied aspects.
- ▶ Maritime migration and human rights in the Mediterranean.
- ▶ Data analysis methods in oceanograph.
- ▶ Beaches: everything you always wanted to know about them but were afraid to ask.
- ▶ Ocean acidification and biomineralisation.
- ▶ The amazing world of seaweeds: an unforgettable journey from biology to gastronomy.
- ▶ Aquaculture in southern Europe: basic and applied aspects.

The law governing doctoral studies in Spain (Royal Decree 99/2011, of 28 January, *regulating officially recognised doctoral studies*, cited earlier) requires that doctoral programmes include training for new researchers. Since receiving approval for the corresponding doctoral programmes delivered by EIDEMAR, these activities have been offered every year to students at the school, as internal courses (click on the link to see a full list <http://goo.gl/rx6Yu0>).

The University of Almeria

- ▶ 2nd Symposium on current administrative law: coastal planning and protection.
- ▶ Image processing and big data in oceanography, with the applied IT ICT-211 Group (in progress).



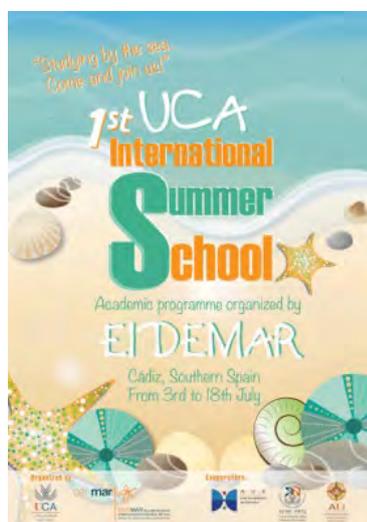
- ▶ One-day conference on ecoports - Enrique Montero Montero.
- ▶ Outdoor poster: Almerian fishermen – guardians of the sea's health.
- ▶ **CEI·MAR** R&D&i seminar.
- ▶ Conference of Excellence on oceanography, organised by the TEP-234 IT & Environment Group (in progress).
- ▶ Study day/workshop on salt marshes, organised by the Arid Zone Ecology RNM-174 Group (in progress).
- ▶ 2nd Symposium on current administrative law: coastal planning and protection.
- ▶ One-day conference on ecoports - Enrique Montero Montero.
- ▶ 4th Research symposium on experimental science.
- ▶ Network training course on coastal aquifers and marine intrusion: "Principles, mathematical simulation and identification of processes".
- ▶ 8th Symposium on current administrative law "coasts and town planning: science and new regulations" (in progress).
- ▶ Workshop in collaboration with the OPP of Almeria aimed at technical optimisation of fishing vessels (in progress)

University of the Algarve

- ▶ Fieldwork activity at **LABIMAR** for students from the University of the Algarve (<http://goo.gl/larWux>).
- ▶ Coast Tools Summer Course 2015 (<http://goo.gl/pg4C9L>).
- ▶ Ocean Technology Summer School 2016 (<http://goo.gl/PFc92P>).

University of Cadiz

The University of Cadiz delivers a range of multidisciplinary marine-themed *internal courses*, mainly master's degrees and expert courses in





the fields of engineering, the environment, law, economics and health, which always include a specific module on the sea and coast. Notable among these are the following (the web page indicates if the course has been delivered several times and if – as is usually the case – it will continue to be delivered in the future):

- ▶ Master's Degree in Maritime Health (<http://goo.gl/nlD9lh>).
- ▶ University Certificate in Ocean Navigation. Bridge Section (restricted to Civil Guard Vessels) (<http://goo.gl/9Ljr1t>).
- ▶ Internal Master's Degree in Nature Management and Conservation (<http://goo.gl/QsKVjq>).
- ▶ University Expert in Waste Management (<http://goo.gl/3bJg10>).
- ▶ University Expert in Environmental Consultancy (<https://goo.gl/2vLLLp>).
- ▶ University in Expert in Environmental Education (<https://goo.gl/JkWM5t>).
- ▶ University Expert in Management and Development of Renewable Energy, with modules on marine generation, corrosion of materials at sea, etc. (<https://goo.gl/T7wVPm>).
- ▶ University Expert in Water Treatment (<https://goo.gl/o3dCT8>).
- ▶ University Expert in Planning and Conservation of Natural Areas (<https://goo.gl/NBX5jr>).
- ▶ Master's Degree in Sustainable Management of Coastal and Marine Systems (<https://goo.gl/8otYdh>).
- ▶ Master's Degree in Environmental Management and Auditing (<https://goo.gl/yKVORj>).
- ▶ Master's Degree in Nature Management and Conservation (<http://goo.gl/QsKVjq>).
- ▶ Master's Degree in Waste Treatment and Management (<https://goo.gl/HfmUqq>).
- ▶ Master's Degree in Wastewater Management and Treatment (<https://goo.gl/eEkNgi>).

- ▶ Master's Degree in Port Planning and Intermodality (<https://goo.gl/e72wlf>).
- ▶ Master's Degree in Renewable Energy Management (<https://goo.gl/Ll6aLZ>).
- ▶ University Expert in Maritime Medicine (<https://goo.gl/YkhANz>).
- ▶ University Expert in Underwater and Water Sports Medicine (<https://goo.gl/pTJT9g>).
- ▶ Expert in oil refinery intensification, in collaboration with CEPESA (<https://goo.gl/ssn52K>), for the San Roque refinery (Cadiz), on the coast of the Campo de Gibraltar (<https://goo.gl/eNIOZJ>). This course has required the signing of specific agreements with the refinery and features on the undergraduate degree course in Industrial Engineering.

The seasonal courses offered by the University of Cadiz include the following:

- ▶ 18th Autumn Course at the Algeciras Campus:
 - ◊ *Port Logistics Engineering in the Bay of Algeciras: challenges of a latest generation port* (<http://goo.gl/w090NY>)
- ▶ Tetouan sub-centre:
 - ◊ *Renewable energy on both shores. An approach to cooperation.* Course coordinated by the UCA and UAE (Morocco) (<http://goo.gl/AJuzOg>, link to news: <http://goo.gl/O24usu>).
- ▶ 18th Autumn Course at the Jerez Campus:
 - ◊ **CEI·MAR-CeiA3 Seminar of Excellence: Agrifood diversification based on wine and salt** (<http://goo.gl/XDOxxv>).
 - ◊ 65th Summer Course at the Cadiz Campus.
 - ◊ **CEI·MAR Seminar of Excellence. The Blue Economy: Andalusia and the Sea** (<http://goo.gl/TXfpHX>).



Universities of the CEI-MAR partnership prioritised specialised training in marine-maritime studies within their portfolio of internal degrees

- ◇ CEI-MAR Seminar of Excellence: Coastal Hazards and Vulnerability (<http://goo.gl/u8qmm0>).
- ◇ CEI-MAR-CEIA3 Seminar of Excellence: The importance of knowing how to communicate and disseminate science (<http://goo.gl/kJvXnK>).
- ▶ Notable courses delivered at LABIMAR (this laboratory is discussed below, and full details of activities are given in Section C.2.) include the following:
 - ◇ Practical work on the undergraduate degree in Marine Science at the University of Cadiz, in the following subjects: zoology, botany, marine ecology and methods in oceanography.
 - ◇ Practical work on the undergraduate degree in Environmental Science at the University of Cadiz.
 - ◇ Practical work on the master's degree in Oceanography (officially recognised inter-university degree delivered within the framework of CEIMARNET, and detailed below).
 - ◇ Courses delivered during CEI-MAR's 2nd International Summer School have included: *Aquaculture in southern Europe: basic and applied aspects* (<http://goo.gl/5Cwjpjx>), and *The amazing world of seaweeds: an unforgettable journey from biology to gastronomy (13-17 July)* (<http://goo.gl/oaymKx>).
 - ◇ Practical work for undergraduate students at the University of the Algarve (<http://goo.gl/ESppWj>).
 - ◇ Practical work for undergraduate students at the University of Granada (<http://goo.gl/ESppWj>).
 - ◇ Scientific dissemination activities, notable among which is the seminar delivered by Professor Chen from the University of Boston. "Science education", a series of *Invescerca* conferences, 2015 and 2016 (<http://goo.gl/fkNSWw>), inauguration of the Malaspina exhibition and series of Malaspina lectures, EIDEMAR doctoral course on isotopes, workshop on *The algae of La Caleta: identifying algae and creating specimen sheets* (November 2015) (<http://goo.gl/wf7H-GV>), workshop on *seaweeds and seagrasses* (January 2016), workshop on *School comes to LABIMAR*, targeting primary and secondary education students (<http://goo.gl/nxjwER>), etc.



The University of Huelva

- ▶ Frontiers: 1st Spanish-Portuguese Seminar. Industrial canning and salting heritage (<http://goo.gl/dDmTtk>, <http://goo.gl/2Tm9mV>, <http://goo.gl/nD2o6q>).
- ▶ Renewable energies and energy efficiency (<http://goo.gl/GMI6ig>).
- ▶ Introductory course on environmental education in coastal spaces in Huelva: "Marine environmental education" (<http://goo.gl/HsoxUJ>).
- ▶ Course on the natural heritage of the Huelva Coast (<http://goo.gl/ipPBTo>) <http://goo.gl/i5V35F>).
- ▶ University aquaculture specialist course (<http://www.uhu.es/acuicultura/>; <https://goo.gl/EuTUlo>).
- ▶ Practical work for vocational training students with the Algae Biotechnology Research Group.
- ▶ 3rd International Memorial Congress on the Discovery of America: "Ships and shipbuilding in the era of discovery" (<http://goo.gl/gMfRRV>).
- ▶ Study Day on "The Andalusian coast in perspective: regulations and nature" (<https://goo.gl/gE887r>).
- ▶ 1st CEI-MAR R&D&i Seminar.
- ▶ Study Day on Atlantic ports and their relationship with Ostia Antica (<https://goo.gl/nY79Ru>).
- ▶ Lecture series on the Spanish language in the world. Geography, history and language of the *almadrabas* (traditional tuna fishing).
- ▶ The future of the Spanish energy model: hydraulic fracking and renewable energy.
- ▶ Study Day Report of "Nos Movemos" results on the coast.
- ▶ Study Day "Marine resources on the Huelva coast" (<https://goo.gl/JpNd7g>).
- ▶ 2nd CIM Breaking News Forum: the inhabited sea. Irregular immigration over the maritime border in southern Europe (<https://goo.gl/lczvkl>).
- ▶ Researcher's Night: exhibitions, workshops, short talks, etc.
- ▶ Science Week: laboratory visits, workshops: "Marshlands: a threatened resource", "Clams and their medicinal properties", "Microalgae: a sea of applications".
- ▶ "The Sea" University Graffiti Contest.
- ▶ Culture Week with the Class of Experience: Wetlands Study Day in "La Rocina and El Acebrón" (Doñana National Park) (<http://goo.gl/MuQbqu>).
- ▶ Malaspina Exhibition.
- ▶ Raising awareness of marine science:
 - ◇ Wetlands Day Competition.
 - ◇ Adults and children play and learn together on the "Juan Carlos I Espigón beach".
 - ◇ Workshop on renewable energies.
 - ◇ 1st Competition of science stories about the sea, "CEI-MAR Tales" (<https://goo.gl/aHLmGC>).
 - ◇ Scientific poster exhibition/contest.
 - ◇ Fish farmer for a day.
 - ◇ Removal of cat's claw in the Dune Park with SEO.
 - ◇ Bird ringing with SEO in Odiel Marshlands Natural Area.
 - ◇ Removal of lead in Doñana with SEO.
 - ◇ Ringing flamingos in the Odiel Marshlands.
 - ◇ Environmental restoration of the Odiel Estuary.



Picture of training days and activities on CEI-MAR topics held by the University of Huelva

- ◇ Environmental restoration of the left bank of the Odiel Estuary: planting native species.
- ◇ Yoga on the beach.
- ◇ Kayaking.
- ◇ Hike and Visit to the *Gruta de las Maravillas*.
- ◇ Hiking Route.
- ◇ Horse riding route.
- ◇ Green Lane.
- ◇ Lecture: "Monitoring and marking of overwintering and reproductive ospreys (*Pandion haliaetus*) in the province of Huelva".
- ◇ Excursion: "Bird watching at the Laguna del Portil, Piedras River marshlands and Isla Cristina marshlands".
- ◇ Practical course: "Sample collection and analysis of stress indicator parameters in fish" for the subject "General principles of aquaculture", on the master's degree in "Advances in Agricultural and Aquaculture Biology".
- ◇ Practical course: "Introduction to preparation and dissection of the sea urchin *Paracentrotus lívidus*" for the subject "General principles of aquaculture", on the master's degree in "Advances in Agricultural and Aquaculture Biology".
- ◇ Collaboration in the practical course: "Isolation and identification of algae" for the subject "Marine Biology for Undergraduates".
- ◇ Visits from schools in Cordoba (1) and Granada (3), cultural associations (1), the Association of Lifelong Learning University Students at the University of Granada and the Lundenia Sports Instructors Training Centre.

University of Granada

- ▶ Outreach activities of the CEI-MAR-UGR Marine Classroom:
 - ◇ Aquaculture Day. (<https://goo.gl/4yRkaG>).
 - ◇ Experimental stage of the master's degree final project: "Physiological adaptation of tench to increased salinity". Within the master's degree on "Advances in Agricultural and Aquaculture Biology".

- ◇ Participation as a contact centre for the network of marine observatories in the Andalusian Mediterranean, as part of the ICM-CSIC project "Marine Observatories" (<https://goo.gl/eEa6jb>).
- ◇ Various proposals for implementation at the Science Park Biodome suggested by CEI-MAR research



groups (in progress) (<https://goo.gl/UA1HkY>).

- ▶ 1st CEI-MAR-UGR Marine Classroom Aquariology course (in progress) (<https://goo.gl/JUudhC>).
- ▶ Lecture series: "Marine knowledge" (<http://goo.gl/fbJNF5>).
- ▶ 3rd Summer School: "Estuarine and near-shore systems: from fundamentals to cutting-edge knowledge" (<http://goo.gl/tjilY3>).
- ▶ Series of marine documentaries (<http://goo.gl/5Z7FQK>).
- ▶ Active participation in the Citizen Science Project "Marine Observers", organised by the Spanish National Research Council Institute of Marine Sciences.
- ▶ Photography workshop in aquariums.
- ▶ Inclusive activity "The accessible sea": education for people with disabilities.

University of Malaga

- ▶ 1st specialist course on auxiliary techniques in dermatological thalassotherapy. (<http://goo.gl/34pqUy>).
- ▶ University Expert course on sun, sea and health (<http://goo.gl/x1LDtd>, <http://goo.gl/x62sZ2>).
- ▶ Benthic biodiversity in the mediterranean sea: macrofauna (<http://goo.gl/2xOXk-Q>, <http://goo.gl/wnjgB>).
- ▶ Organisation of the 1st course on advanced analytical techniques for measuring marine isotopes (<http://goo.gl/wLP0dW>).

Underwater Archaeology Centre (CAS-IAPH)

- ▶ Underwater archaeological heritage. Study methods and techniques (<http://goo.gl/eAEEwU>).

- ▶ Historical study of maritime and underwater archaeological heritage based on archival research on historical shipwrecks.
- ▶ Study of coastal navigation: information on historical courses in the 16th-19th centuries.
- ▶ History of ports in the Bay of Cadiz and identification of heritage, based mainly in the compilation and comparative analysis of maps from the 16th-18th centuries.
- ▶ Historical studies on maritime and underwater archaeological heritage: use of newspaper sources from the provinces of Cadiz, Malaga and Almeria.
- ▶ Study of coastal navigation: information on historical Italian, French, Portuguese, English and Spanish courses (corresponding to the 16th-19th centuries) to determine navigable areas, ports and support infrastructures, anchoring points and fresh water supplies, presence of rocky shallows or currents, shipwrecks and leading lines used by sailors.
- ▶ IAPH-UCA course: Underwater archaeology techniques: (I) Photogrammetry applied to underwater archaeology documents (<http://goo.gl/ITkSjp>).
- ▶ IAPH-UCA course: Underwater archaeology techniques: (II) Introduction to ICTs applied to maritime history and archaeology (<http://goo.gl/T4I5Za>).
- ▶ Scientific diving course in collaboration with the University of Granada, 2016 (<http://goo.gl/3yiUCC>; <http://goo.gl/qwtXaT>).
- ▶ IAPH-CEI-MAR course: Theoretical and practical course on underwater archaeology survey techniques (<https://goo.gl/eLjm4Z>).
- ▶ Course in collaboration with the Spanish National Distance University, Cadiz: Underwater archaeology, a science and profession (<http://goo.gl/uaZtdA>).



- ▶ Course in collaboration with the Spanish Ministry of Education, Culture and Sport on the conservation and restoration of underwater archaeological heritage.
- ▶ Course: Underwater archaeology in Spain 2015-2020 (<http://goo.gl/rxNPN9>; <http://goo.gl/R0c0V2>).
- ▶ Course in collaboration with the University of Granada: Scientific diving course. Lecture by Milagros Alzaga García on current issues in underwater archaeology in Andalusia; underwater archaeology surveys. 2015.
- ▶ Participation in the Study Days: "The risk of tsunamis in the Iberian Peninsula in light of the 1 November 1755 disaster"; historical tsunamis on the Cadiz coast from an archaeological perspective (<http://goo.gl/ZvbdkP>; <http://goo.gl/02OV7b>; <http://goo.gl/iGiH1N>).
- ▶ Participation in the Study Days: "Maritime borders: port cities and their cultural universe"; discovering the port system in the Bay of Cadiz in modern times through historical maps (<http://goo.gl/e61Yw9>).
- ▶ Participation in the "International Archaeology Congress"; The circulation of products packaged in jars in Republican Gades: New data from underwater contexts at La Caleta (Cadiz).
- ▶ Jerez Science Fair, participating in:
 - ◊ Installation of a stand exhibiting educational and outreach materials.
 - ◊ Delivery of a workshop on underwater archaeology: "Pirates Workshop".
- ▶ Participation in the "History Study Days on Juan Díaz de Solís"; Discovering our history through archaeological heritage.
- ▶ Participation in Researchers' Night 2015; short meeting on "Underwater archaeology and knowledge of historical shipwrecks in the Bay of Cadiz".
- ▶ Science Café.
- ▶ Participation in "Study Days on the historical, cultural and natural heritage of La Caleta"; The problem of underwater archaeological heritage at La Caleta (<http://goo.gl/knZsf2>; <http://goo.gl/zHbhKq>).
- ▶ Participation in the "3rd Seminar on Maritime History and Heritage":
 - ◊ A lecture on the results of the Delta and Trafalgar projects given by Carmen García Rivera, Director of the Underwater Archaeology Centre
 - ◊ A guided tour of CAS-IAPH facilities.

Spanish National Research Council (CSIC)

- ▶ 1st Workshop on Iberian decapod crustaceans.
- ▶ UE, IOC-UNESCO, IMBER and CEI-MAR Workshop 'Coming to grips with the jellyfish phenomenon in southern European Seas (SES): research to the rescue of coastal managers'.
- ▶ UE, IOC-UNESCO, IMBER and CEI-MAR Workshop 'Coming to grips with the jellyfish phenomenon in southern European Seas (SES): research to the rescue of coastal managers'.
- ▶ Organisation of the talk: "Marine observers, a citizen science tool to contribute to knowledge of marine life: biodiversity and problems", given by Dr. Pere Abelló from the ICM-CSIC and held in the UCA's e-teaching classroom (<http://goo.gl/rKwnsc>; <http://goo.gl/SjBvj0>).

Institute of Research and Training in Agriculture and Fisheries (IFAPA)

ICMAN-CSIC and the Faculty of Marine and Environmental Sciences at the University of Cadiz have consolidated their specialist seminars on handling laboratory animals. These courses



Underwater archaeology (left, CAS) or the techniques for measuring marine isotopes (right, UMA) are both examples of the specialised training diversity at CEI-MAR

have been accredited by the Institute of Research and Training in Agriculture and Fisheries (IFAPA) and offer 20 **CEI-MAR** grants for students:

- ▶ Handling laboratory animals - Category B (<http://goo.gl/f8i2wp>, September 2013 and June 2014 (postponed to October).
- ▶ Handling laboratory animals - Category C (<http://goo.gl/iqC5Jb>, September 2013 and June 2014 (postponed to October).
- ▶ Organisation of the 15th National Congress / 1st Iberian Congress on Aquaculture (<http://goo.gl/7FL1IA>; <http://goo.gl/EAlxtJ>).

CEI-MAR's educational activities also target society in general, through the organisation of scientific dissemination events (see Section C.2.). Those discussed in this Section mainly correspond to courses and study days aimed at providing pre-university education guidance for high school students and more generally informing members of the public about research. **LABIMAR** has played a leading role in this activity (<http://goo.gl/4Yywp>; <http://goo.gl/nFoOhw>), as described below and in more detail in the corresponding section on scientific dissemination.

As regards improving material resources such as ICTs, e-teaching facilities, the virtual campus, etc., and independently of each university's individual strategy for meeting the demand to

improve its facilities, several actions have been financed through the "Enhancement" sub-programme, as summarised below:

- ▶ Design and launch of the **SEA-PILLS web platform** and a native application for all kinds of computing and mobile devices (tablets, telephones, etc.). This platform is the main portal for viewing Campus audiovisual content, including teaching, research, transfer, university outreach and voluntary work content, and is used to store, manage, view and download audiovisual resources generated by **CEI-MAR**. The portal boasts a fresh, modern design, originally conceived to appeal to its primary target audience (the student community), but also appropriate for the research community and society in general. Unlike other sites such as YouTube, it allows videos, documents and photographs to be uploaded and downloaded, and is permanently accessible to members of the public. The SEA-PILLS platform has become a working tool for the Campus, but is also a vehicle for continuous dissemination adapted to the new information technologies and Internet-based educational initiatives (see Section C.5.).
- ▶ New e-teaching classrooms to help consolidate and expand the courses offered by **CEI-MAR**, ensuring national and international dissemination. All **CEI-MAR** univer-



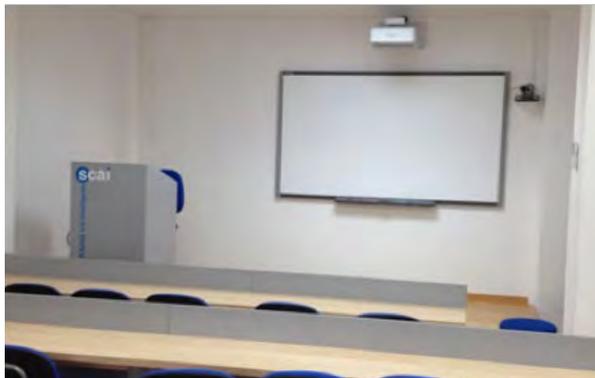
sities have e-teaching classrooms, physical spaces for the delivery of teaching via the best communication channels and new technologies. This not only facilitates delivery of participative web-based educational activities, but also maximises real-time dissemination of the sessions and their storage for subsequent reuse. This ensures that CEI-MAR's wealth of material resources continues to grow and be available for future activities, as well as making them universally accessible through the Campus of Excellence web page.

- ▶ These e-resources will contribute to all CEI-MAR courses, including officially recognised degree courses. To this end, CEI-MAR universities are developing, or have already developed, specific regulations governing online courses, a complex process due to the numerous elements that must be considered: not only the delivery and the necessary technological resources, but also quality (in line with ISO procedures), teaching contact time, registration procedures, and student supervision and assessment, as well as quality assurance protocols. However, this enables CEI-MAR to offer *Massive Open Online Courses* (MOOCs), albeit adapted to the requirements of the Campus of Excellence. Standardisation of the communication and media protocols for these classrooms involves resource optimisation and has made it possible to increase the number of existing online courses.
- ▶ Part of the funding obtained through the "2010 Enhancement" project grant programme has been destined for the complete equipping of an e-teaching classroom in the Central Research Support Services (SCAI) building at the University of Malaga (classroom already installed). The funding obtained in the "Enhancement 2011" project grant programme was awarded in its entirety to the University of

Cadiz. Consequently, seven classrooms distributed across the University of Cadiz's various campuses and in centres where most undergraduate and postgraduate teaching of CEI-MAR courses takes place have been equipped with e-teaching resources (details in Section A.4.).

Specialist teaching spaces for quality teaching. Two initiatives associated with the EIDEMAR International Doctoral School and the Campus areas of specialisation "Marine Knowledge", "The Sea as a Source of Resources" and "The Cultural Value of the Sea" have had an enormous impact on CEI-MAR teaching and social visibility because they transcend traditional university spaces and are located on the coast (in a natural protected area and an area of great historical importance, respectively). These are:

- ▶ The La Esperanza saltworks, located in the municipality of Puerto Real and covering an area of 369,000 m² in the heart of the Bay of Cadiz Natural Park (<https://goo.gl/Bg9I9F>). Concession to the University of Cadiz has enabled implementation of the project "Integrated sustainable management of the La Esperanza saltworks", which includes artisanal sea salt production and hand-harvesting sea salt, sustainability <https://goo.gl/VRgUx5>, and environmental education and ecotourism. Several workshops have been held for schools and adults to raise awareness about the saltworks landscape and culture, and these have been attended by national and overseas students.
- ▶ The Marine Research Laboratory (LA-BIMAR), installed in the San Sebastian Castle located in the municipal district of Cadiz, an eighteenth-century fortress built to defend the city of Cadiz that the City Council has restored for various social functions (Section C.2.).
- ▶ These two laboratory spaces will be used for scientific teaching, research, dissemi-



CEI-MAR bet on teaching innovation by fitting virtual teaching classrooms (left, UMA) or the use of unique teaching spaces (course on salt extraction, "La Esperanza" saltworks, right)

nation carried out by the partnership, and offer a wide range of other activities (Sections A.4. and B.7.).

- ▶ Another teaching space for marine studies is the "Marine Classroom" (Aula del Mar) at the University of Granada, intended as a focal point for marine-themed teaching, research and outreach activities at this university (<https://goo.gl/2h7FNi>; <https://goo.gl/zMmNlq>).



ROLE OF PARTNERSHIP MEMBERS

As has been indicated in the preceding pages, over the past five years CEI-MAR members have carried out a wide range of educational marine- and maritime-themed activities in their various institutions. The nature and the scope of each activity has benefitted from each institution's area of specialisation, always with the goal of contributing to the definition of a distinctive range of CEI-MAR courses, generally in the context of EIDEMAR or the *International Summer School*, LABIMAR, the Marine Classroom or other educational spaces designed for CEI-MAR (salt marshes, e-teaching classrooms, etc.).

The end result has been to create a suite of courses coordinated in line with the criteria defined by the CEI-MAR Campus of Excellence. The excellence of this suite of courses is unques-

tionable, encompassing as it does all branches of science, as well as subjects ranging from health to engineering; from renewable energy to the law on maritime trade and logistics; from economics to shipbuilding and offshore construction; from the history of navigation to oceanographic expeditions around the world; from tourism to coastal management; from traditional and artisanal exploitation of marine resources to the most advanced industries and innovation; from fishing and the cultivation of algae to large migrations and the birth of cultures; from the sea as a frontier to the sea as a means of communication between peoples. Furthermore, these are uniquely integrated within CEI-MAR in such a way that specialisations intersect thanks to convergence and communication between teaching staff and institutions, ultimately rendering CEI-MAR the ideal setting.

Academically speaking, this suite of courses has been made possible thanks to the coordinated actions of all partnership members. General coordination of the educational initiatives and strategies of CEI-MAR institutions has been achieved on several levels:

- ▶ The first of these is purely institutional, and derives from fundamental agreements adopted by those responsible at each institution (vice-chancellors, directors of research institutions, etc.) for signing collaboration agreements between institutions, guaranteeing the resources and defining



LABIMAR organised numerous teaching activities in the natural environment and at its own premises

the objectives for each individual action, in particular, and for the jointly offered **CEI-MAR** courses in general. In turn, this level of joint action is divided into three sublevels of collaboration and coordination (examples of which have been given above):

- ◇ The first of these derives from agreements under which institutions adhere to **CEI-MAR**, expressing their commitment to future collaboration to achieve Campus of Excellence objectives and tailor their own strategy to that of the Campus of Excellence. Building on these initial agreements, specific agreements have been signed to implement Campus of Excellence decisions, particularly in the field of education (e.g. participation in the **CEIMARNET** network) and research training (e.g. the **EIDEMAR** International Doctoral School).
- ◇ The second of these derives from the incorporation of institutions into the **CEI-MAR** Foundation, the organ of governance of the Campus of Excellence (described in further detail in "Project management"), through its Board of Directors, the legal organ of governance of the Foundation and the Campus of Excellence, which sets the basic criteria for action for all ins-

tutions committed to the Campus of Excellence and the annual strategy.

- ◇ The third of these derives from actions governed by bilateral (or multilateral) agreements to implement special training activities affiliated with **CEI-MAR**, that require signing specific agreements on the individual commitments that each signatory institution assumes. These agreements may be between members of the Campus of Excellence or with other, external institutions.
- ▶ The second level is achieved through specific *ad hoc* organs of Campus of Excellence coordination. These include the *inter-institutional teaching committee*, presided over by the University of Huelva, which defines and implements the strategies adopted by the Board. Composed of those responsible for teaching in each institution (e.g. in the case of the universities, the corresponding deputy vice-chancellors), this committee coordinates the actions of the different institutions, in accordance with their own protocols and their agreements with **CEI-MAR**.
- ▶ The third level is that of *autonomous* action of each institution, as it implements its own educational strategy within the framework of **CEI-MAR** principles and objectives. Each Campus of Excellence ins-



All CEI-MAR infrastructures developed a busy teaching activities agenda, as it is the case of the "Aula del Mar" at the UGR

titution can distinguish its own activities under the name **CEI-MAR**, as a sign of its association with the Campus of Excellence and as evidence of its adherence and commitment to **CEI-MAR** objectives. All these activities are compiled and disseminated via the Campus of Excellence web page and indicate the achievements of **CEI-MAR**. These are all discussed in the various sections of this report.

Besides the actions reported in the previous pages, notable among these are the educational initiatives implemented under the auspices of **CEI-MAR**, which have been designed to meet the needs of students and graduates of partnership universities, using a bottom-up strategy. We will highlight two strategic actions:

- ▶ The high-level *doctoral training activities* (specialist training courses) delivered by the **EIDEMAR** International Doctoral School in an international and collaborative setting with multilingual teaching, which have been jointly designed and implemented by various partnership universities and PRIs (Section A.5).
- ▶ The **CEI-MAR International Summer School**, in which design of an international and competitive high-level programme has facilitated collaboration between Campus members (Section A.2).

These educational activities have served to

strengthen the academic relations between **CEI-MAR** universities and the various institutions that form part of the Campus of Excellence, and between these and the outside world, creating an increasingly integrated and international environment that consolidates, characterises and differentiates **CEI-MAR**.

MOST SIGNIFICANT RESULTS

Progress towards the targets established in the 2011 Report and the **CEI-MAR** Progress Report has been satisfactory and has met expectations in terms of programming, implementation and numerical indicators of progress.

The most significant advances have been as follows:

- ▶ The creation of an educational programme of excellence that leverages and showcases **CEI-MAR**'s potential regionally and internationally. This programme encompasses undergraduate, master's and doctoral levels as well as continuing education required by the companies that in turn contribute to technological innovation. These educational activities also guarantee a high social profile for the Campus of Excellence, which aims to have a positive effect on society. The programme is multi-



disciplinary (encompassing all specialisations within all scientific disciplines) and interdisciplinary (integrating traditionally distant disciplines to jointly address new perspectives), and is intended to meet the needs of society, business and technology, thus enabling CEI-MAR to transform its environment by driving change in the region's economic and employment models. It is also an international programme, which is enriched by the experiences of prestigious overseas institutions of excellence and transfers knowledge to other countries and communities.

- ▶ Creation of the EIDEMAR International Doctoral School in Marine Studies.
- ▶ Expansion of CEI-MAR's educational programme nationally (e.g. the CEIMARNET network) and internationally (e.g. collaboration with the University of Ferrara, universities in the post-Soviet space and the Autonomous University of Mexico), via new strategic alliances that identify CEI-MAR as a benchmark of excellence in quality training (e.g. for the armed forces of the Ecuador; or the attractiveness of the doctoral programme).
- ▶ Consolidation of a European educational strategy (and with other countries associated with the initiatives), evidenced by the Erasmus Mundus programmes (at master's and doctoral levels) delivered by EIDEMAR.
- ▶ All CEI-MAR member universities have completed adaptation of their courses to the European Higher Education Area, including those related to CEI-MAR, which have been adapted in a coordinated manner. Validation and/or accreditation procedures for the officially recognised undergraduate and postgraduate (master's and doctoral) degrees have complied with EHEA guidelines, each university's own specific strategy, and their commitment to developing CEI-MAR's area of specialisation. Over the period 2015-2017, all officially recognised degrees delivered by member universities have been or will be subjected to *renewal of accreditation*, in accordance with the protocols of the competent quality assessment agency. The CEI-MAR degrees presented are undergoing stringent verification.
- ▶ Validation and delivery of the new officially recognised master's degrees associated with CEI-MAR specialisations, which were launched in the academic year 2014-2015. Some of these are inter-university degrees that transcend CEI-MAR borders, i.e. they are delivered in collaboration with other national and overseas marine-themed Campuses of Excellence with whom collaboration agreements have been signed.
- ▶ Delivery in the academic years 2013-2014, 2014-2015 and 2015-2016 of new degree courses validated in previous academic years and associated with CEI-MAR Campus specialisations. This action has been particularly relevant in the context of implementing the first three years of the new doctoral programmes associated with EIDEMAR, and of other marine-themed programmes in principle associated with other Doctoral Schools in the partnership but which are in the process of being incorporated into EIDEMAR due to their specialisation in marine studies. Teaching commenced on the new undergraduate and master's degree courses and doctoral programmes at the beginning of the academic year 2013-2014, and at the time of writing this report celebrated their third anniversary.
- ▶ Creation of new doctoral programmes on maritime themes, affiliated with EIDEMAR, that encompass all Campus of Excellence areas of research. These doctoral programmes enjoy a strong international component in academic terms (number



of overseas students enrolled; number of overseas teaching staff involved in delivery; nature of the educational activities designed) and intent, enabling **EIDEMAR** to design a strategy of alliances with other overseas universities.

- ▶ Delivery in the academic years 2013-2014, 2014-2015 and 2015-2016 of specialist courses forming part of the five doctoral programmes offered by the **EIDEMAR** International Doctoral School in Marine Studies. This suite of courses is also open to research students enrolled on doctoral programmes outside **EIDEMAR** and to interested researchers, thus generating a forum for the exchange of experiences.
- ▶ Creation of an inter-university master's degree committee via the new marine-themed Campus of International Excellence network **CEIMARNET** (**CEI do MAR**: Galicia and northern Portugal; **CEI Mare Nostrum**: Murcia; **Canary Islands Tricontinental CEI**: Canary Islands; **CEI-MAR**: Andalusia, southern Portugal and northern Morocco). This Committee is coordinated and directed by **CEI-MAR** (Section B.1.).
- ▶ The Campus's international teaching profile has been enhanced by organising international courses and seminars in various Ibero-American and US institutions and by promoting the mobility of teaching staff and students at universities with which **CEI-MAR** has signed collaboration agreements. Of particular note is the consolidation of relations with the Siberian Federal University through delivery in July 2013 of an international course on *Environment and Global Change*; with the American University UMass Boston, which actively participated in the coordination and delivery of a course on *Ocean Acidification and Biomineralisation* in the first **CEI-MAR International Summer School**; with Argentina in 2016 through the Argentine Government's BECAR programme in collaboration

with the Spanish Service for the Internationalisation of Education (SEPIE), which has enabled researchers from Argentina to participate in **EIDEMAR** doctoral training activities; and the intensive research training course entitled "Doctoral research in marine studies. Potential, resources and strategy, by the **EIDEMAR** Doctoral School", which was commissioned by the Simón Bolívar University (Colombia), the University of the Armed Forces (Ecuador), the Eloy Alfaro University (Manadi, Ecuador) and the Ibero-American University Postgraduate Association (AUIP) to provide doctoral research training for Ibero-American researchers working in the field of "Marine Sciences" (Sections A.2. and A.5.).

- ▶ International consolidation of **CEI-MAR**'s educational programme and its capacity to attract overseas students, in particular through Erasmus grants (see Section A.6.) and networking with the AUIP (see Sections A.2. and A.6.).
- ▶ Regional visibility of the Campus has been enhanced through the inclusion of courses in seasonal programmes.
- ▶ Installation of new media to enable e-teaching and videoconferencing activities and the creation of a web platform for viewing, downloading and storage of teaching associated with **CEI-MAR** (SEA-PILLS). This has made it possible to optimise opportunities for transmitting sessions which, due to their particular relevance, merit being recorded, stored and used as a supplementary resource in the education and courses offered by **CEI-MAR** (e.g. **EIDEMAR** Inaugural Study Days - Conferences of Excellence) (Section A.5.).
- ▶ Adaptation of collaborative work spaces for small groups and for specialist teaching associated with the **EIDEMAR** International Doctoral School in Marine Studies (Section A.4.):



- ▶ Spaces at the University of Cadiz: “Advanced Education Classrooms in the Marine Aquaculture Facility” in the Andalusian Centre for Marine Studies, CASEM; “Seminar Classrooms for teaching humanities disciplines related to the Sea” in the Faculty of Philosophy and Arts; and the “**LA-BIMAR** Coastal Laboratory” located in the San Sebastian Castle in the city of Cadiz.
- ▶ Spaces at the University of Malaga: the

“Sea and Health Laboratory” and the “Laboratory of Advanced Primary Production” (Section A.4.).

- ▶ Annual update of **CEI-MAR** courses, including new, validated courses that will be launched in the academic year 2016-2017. Total numbers, summarised in the table below, have increased by 5% since delivery of the intermediate Campus Progress Report:

	UHU	UCA	UMA	UGR	UAL	Total
Undergraduate Degrees	20	22	12	6	4	64
Officially Recognised Master's Degrees	8	19	17	17	3	64
Erasmus Mundus Master's Degrees	-	2	-	-	-	2
Doctoral Programmes (DPs)	5	18	11	-	5	39
Erasmus Mundus DP	-	1	-	-	-	1
EIDEMAR DP	-	4	1	-	-	5
EIDEMAR Courses	-	20	-	-	-	20
Internal Courses (Master's Degrees, Expert Courses, etc.)	4	16	5	-	-	25
Internal Master's Degrees	-	9	5	-	-	14

These numbers would be higher if they were to include figures for the University of the Algarve, namely 2 undergraduate degrees, 7 officially recognised master's degrees and 4 doctoral programmes, besides various specialisation courses.

In summary, the following achievements can be highlighted in the field of postgraduate teaching and doctoral research training:

- ▶ Five new master's degrees, delivery of which commenced in the academic year 2014-2015.
- ▶ Five **EIDEMAR** doctoral programmes; four of which were specifically designed for **CEI-MAR**, and conceived and validated at the outset of the International Doctoral School. These programmes involve researchers from all Campus institutions as well as overseas researchers; one is

an Erasmus Mundus Doctoral Programme and another programme is underway, approved by the Governing Council of the University of Malaga (Section A.5.).

- ▶ A suite of over 20 specialist courses delivered by the **EIDEMAR** School, including one programme taught in English (Section A.5).
- ▶ Specialist seminars and expert courses delivered under the auspices of **CEI-MAR** by all Campus universities.
- ▶ Consolidation of the **CEI-MAR International Summer School**.
- ▶ Capacity to attract overseas students (especially within the framework of Erasmus and the AUIP).
- ▶ Creation and launch of the SEA-PILLS web platform.



- ▶ Installation of new e-teaching rooms and equipment funded via the Enhancement Sub-Programme: one classroom at the UMA and seven classrooms at the UCA.
- ▶ Installation of two new specialist teaching areas adapted to the requirements of the EHEA: advanced aquaculture teaching rooms and seminar rooms for disciplines in the Humanities.
- ▶ Creation of two new laboratories at the University of Malaga, the "Sea and Health Laboratory" and the "Advanced Primary Production Laboratory".
- ▶ Creation of the "Marine Classroom" (Aula del Mar) at the University of Granada.
- ▶ Design, implementation and launch of the "LABIMAR Marine Research Laboratory" located in the San Sebastian Castle, for teaching, research and dissemination purposes.
- ▶ Consolidation of the working groups responsible for the design and implementation of inter-university master's degrees (CEIMARNET Network, CEI-MAR is responsible for coordinating the working group).

Furthermore, the **CEI-MAR Foundation** has provided considerable impetus to the agreement signed between Cadiz City Council and the University of Cadiz regarding the concession of premises for **LABIMAR**. The agreement provides for use of the facilities by all **CEI-MAR** institutions, and especially for doctoral studies organised by **EIDEMAR**.



INTERNATIONALISATION ACTIONS

One of the key objectives of **CEI-MAR's** education strategy is internationalisation, both from the perspective of attracting talent (students and teachers) to improve Campus of Excellence prospects and opportunities, and from the pers-



Teaching session at the Marine Research Laboratory (LABIMAR)

pective of the international profile of **CEI-MAR's** educational programme. This philosophy underpins the creation of **EIDEMAR**, management of the activities envisaged for the school and all other actions related to education: the design and the internationalisation of degree courses, the establishment of alliances with other universities and institutions and agreements with overseas countries, etc.

The internationalisation actions taken during the five years of existence of the Campus of Excellence and described in the preceding sections have been implemented gradually, imbuing all **CEI-MAR** training and educational activities as a working philosophy.

This is evidenced by the high level of participation of overseas researchers, teaching staff and institutions in **EIDEMAR's** degree courses, in those of Campus member universities; and in specialist training programmes (doctoral training activities, the *International Summer School* and other specialist courses), some of which are taught in English or other languages. This has led to an increase in the number of overseas undergraduate, master's degree and doctoral students enrolled on Campus programmes. The number of students taking internal courses has also risen in recent years, currently accounting for almost 20% of the total of officially recognised degrees.

Consolidation of **CEI-MAR's** strategies and in-



ternational networks in relation to attracting students, mainly in the field of officially recognised degrees (e.g. through Erasmus) and the definition of new courses (master's degrees, doctoral programmes, internal courses and specialist courses) has in turn permitted consolidation of the Campus of Excellence educational programme and rendered the Campus an international benchmark in education and training (e.g. relations with Ecuador and doctoral training projects with the AUIP). The most notable details and significant examples of these internationalisation activities have been reported in the preceding pages. On this basis, strategic international alliances have been consolidated, most notably with National Autonomous University of Mexico and the University of Ferrara.

In short, CEI-MAR has assumed and met the challenges identified in the definition of the Campus of Excellence, frequently exceeding expectations.



MOST SIGNIFICANT DEVIATIONS FROM INITIAL OBJECTIVES AND RESULTS OBTAINED

- ▶ CEI-MAR has successfully fulfilled the objectives and actions defined in this programme, exceeding initial expectations for the Campus project. Objectives have been met and the numerical targets established for the indicators associated with this area have been reached.
- ▶ At the outset of the project, the University of Cadiz in its capacity as the coordinating university took responsibility for initiating and implementing many of these actions. However, in the period 2013-2016, the participation of each institution in the promotion and implementation of the Campus's educational and training activities increased significantly, resulting in specific Campus programmes, courses

and seminars at all member universities as well as new teaching facilities to provide a better education in marine-themed activities in addition to the normal functioning of each institution. This positive trend shall be strengthened in the future. The coordination committees have made it possible to gradually define and drive each agreed CEI-MAR action.

- ▶ Although the doctoral programmes offered by the EIDEMAR International Doctoral School initially relied heavily on the research potential of the University of Cadiz, this profile has now been solidly complemented through the participation of those institutions with closely related capabilities and the collaboration of researchers from other universities. The inter-institutional teaching committee is working on the definition of inter-university programmes, whether designed *ad hoc*, in accordance with the research specialisations offered at member universities, or by transforming present programmes (incorporating doctoral researchers from other universities and institutions). The adherence of the two overseas universities that already participate in the Campus of Excellence, one in Portugal and the other in Morocco, to the EIDEMAR International Doctoral School evidences the success of the School's strategy, as does the expansion of its doctoral training courses to other overseas universities (in Colombia, Ecuador, Italy, Russia and so on), under the abovementioned terms (specific agreements, thematic networks with the AUIP, etc.). Nevertheless, work remains to ensure that other Campus institutions participate fully in the doctoral programmes, to leverage and share their specialist research potential. Although the academic, regulatory and institutional bases are in place, this final push forward as regards collaboration with CEI-MAR is still pending.



- ▶ All **CEI-MAR** universities have designed and delivered new specialist Campus courses; however, there is a need to increase the range and improve coordination and programming in order to offer courses leading to specialist inter-institutional qualifications. Therefore, the task ahead is to continue consolidating **CEI-MAR**'s educational programme.
- ▶ To improve the dissemination of information, the Coordination Office has already begun to implement improvement and coordination actions on the website and social media to achieve more homogeneous dissemination of the specific education offered by the Campus.
- ▶ From the outset, **CEI-MAR**'s objectives included a review of undergraduate degree courses with the same level of rigour as that applied to the master's degrees, doctoral programmes and continuing education courses; however, universities do not have the same autonomy to create these degree courses as they do for the others. Master's degrees and doctorates reflect the universities' areas of specialisation, and these enjoy considerable discretion in the definition of new courses. In contrast, undergraduate degree courses are more rigidly controlled, and the decision to implement them rests with external agencies (in Andalusia, the ministry responsible for university education). Consequently, progress with undergraduate degree courses has been limited to the possible areas, which do not include the introduction of new degree courses:
 - ◊ Review of degree courses, in accordance with university quality assurance, ensuring their alignment with **CEI-MAR**'s principles and strategy.
 - ◊ Coordination of the degrees as a first step in basic university education, where the role of the master's degrees and doctoral programmes (in relation to officially recognised courses), continuing education (specialisation courses) and undergraduate student mobility is to ensure postgraduate specialisation.



PROPOSALS FOR CORRECTIVE ACTIONS

This programme is progressing satisfactorily and has exceeded expectations. However, some areas require improvement actions:

- ▶ Over the coming academic years, the Steering Committee of the International Doctoral School in Marine Studies must finalise the details of the new specialist inter-university courses to be offered by **EIDEMAR**.
- ▶ In the medium term, it is important to obtain the resources that will enable us to increase our international, inter-university and highly specialised programme of courses that until the 2015-2016 academic year has been offered through the various institutions that comprise the partnership.
- ▶ **CEI-MAR** courses must continue to be updated and coordinated, since they are the keystone to **CEI-MAR**'s identity as a teaching campus.
- ▶ As regards undergraduate degree courses, due to the circumstances indicated above, the review of official degree reports must continue, subjecting them to verification by quality assessment agencies, to ensure their compliance with the **CEI-MAR** strategy.



SECTION A.2. Extending the range of international courses

Strategic area	Improving teaching and adapting to the European Higher Education Area
Programme	Extending the range of international courses
Objectives	To increase and internationalize the range of CEI-MAR courses
	<p>Since its beginnings, CEI-MAR's main strategy has included foreign universities belonging to the EHEA (University of the Algarve in Portugal) and from North Africa (Abdelmalek Essaadi University in Morocco), both geographically close locations. The CEI-MAR universities' range of courses therefore, already demonstrates a high degree of internationalization since they are delivered by institutions located in three different countries and on two continents. It is to this base that the universities making up the partnership, under the auspices of the Campus of Excellence, will extend the range of international courses on offer and internationalize their programmes, including those already in existence, those that have been created over the last five years and those that will be created in the future.</p> <p>In the initial 2011 report, 4 objectives were established:</p> <ul style="list-style-type: none"> ▶ To study and implement joint degrees between CEI-MAR universities. To implement double degrees between Spanish and/or foreign universities. ▶ To study and implement new Erasmus Mundus Masters' Degrees. ▶ International advanced specialization courses. ▶ CEI-MAR Seasonal courses—CEI-MAR Summer School. <p>Three additional objectives have been added to these in order to provide the Campus with solid operational structures that guarantee its future sustainability:</p> <ul style="list-style-type: none"> ▶ To establish those structures necessary to design, plan and channel the programmes in terms of internationalization of the courses. ▶ To study and implant new Masters' and doctorate programmes, in addition to doctoral training activities. ▶ To design and implement advanced specialization courses, available to the international community, promoting mobility and attracting talent to the Campus of Excellence.

A.2. EXTENDING THE RANGE OF INTERNATIONAL COURSES

INITIAL OBJECTIVES OF THE 2011 PROPOSAL

In the initial 2011 report, the general objective was "**To increase and internationalize CEI-MAR courses**". To achieve this objective, the four pro-

grammes mentioned above were set up and have been run, at the same time that other new ones have been added, as the project has grown and evolved and new needs have arisen.



SUMMARY OF WORK ACCOMPLISHED

From the awarding of the CEI-MAR project up to the present, actions intended to consolidate the Campus of Excellence and to achieve the objectives set can be divided into three main fields: structural programmes, new international courses and singular or specific programmes. The programmes listed here have been carried out during the 2011-2016 period that is the subject of this report, and are added to the original list of courses of the universities belonging to the Campus, enriching and widening the range (in accordance with the objective of increasing the pre-existing list). It is important to note that outside of its geographical area (Andalusia, Tangiers-Tetouan and the south of Portugal) the result of the joint work of the institutions belonging to CEI-MAR and the international exposure work carried out by the Campus of Excellence is considered as one of the strongest academic offers in the marine-maritime field on a worldwide level, with its multidisciplinary and interdisciplinary character being especially noted.

1.- STRUCTURAL PROGRAMMES

CEI-MAR defines among its main priorities, the creation of structures to coordinate its operation and sustainability in time. Given the complexity of the Campus, involving three countries, two academically different geographical areas (Morocco and the European Higher Education Area), seven Universities, public research institutions (PRIs) and businesses, these structures, once created, must develop gradually until they reach their full potential.

- ▶ **Interinstitutional Teaching Commission and Interinstitutional Internationalization Commission.** The internal structuring of the campus was one of the tasks necessary in order to make it possible to govern and run it. In the field of teaching, the creation and start-up of the Interinstitutional Teaching and Internationalization Commissions must be noted, coordinated respectively by the Universities of Huelva and Almeria. The

commissions have been in operation since then holding both face-to-face and virtual meetings at regular intervals, taking advantage of the potentiality and resources of the TICs already existing or developed within the framework of CEI-MAR programmes (see section A.4).

Among the achievements of the Interinstitutional Teaching Commission, it is important to highlight the design and setting up of the EIDEMAR International Doctorate School (see section A.5) and its selection of courses in English, and the Masters' interuniversity and international doctorate programmes available stemming from it (see section A.1), all of which will be discussed below.

On another note, one of the most important achievements of the Interinstitutional Internationalization Commission was to get CEI-MAR into the Erasmus+ programme, participating as a Higher Education Consortium and obtaining the Erasmus+ projects KA103 and KA107 (see section A.6), setting up internal international mobility grant offers, both within the framework of existing projects and for those internal to the Campus of Excellence, and participating in and obtaining projects in the Erasmus+ KA2 grant schemes.

- ▶ **The EIDEMAR International Doctorate School of Marine Studies** started its life under the umbrella of the Campus of Excellence during the 2013-14 academic year with four multidisciplinary, specialized doctorate programmes and an important selection of specialization courses in English. Although the EIDEMAR programmes will be discussed in the corresponding section (see section A.5), here we will deal with those aspects that influence the international exposure of the doctorate studies of the partnership and the increase in the range of international courses. We must note the range of learning modules in English, the adscription to the International Doctorate School of Erasmus Mundus Masters' and doctorate



Signing session of the agreement for CEI-MAR Foundation incorporation with the attendance of the University of Algarve (Portugal) and the Abdelmalek Essaadi University (Morocco)



Hundred students from Europe, America and Asia participated in the 3rd CEI-MAR International Summer School

programmes, the creation of interuniversity Masters' Degrees with international exposure, joint doctorate agreements with Italy, and double Masters' Degrees with Italy, Russia and Mexico or the creation of the *International Summer School*, among others. All of these will be discussed in the following paragraphs.

- ▶ **International Summer School.** Of a structural nature and as support to the **EIDEMAR** International School, the **CEI-MAR International Summer School** was created in 2014, linked to the former and focused on running specialization courses in English for doctorate, Masters' Degrees and specialist students, with the aim of becoming an international reference point in continuous training and teaching, specializing in marine-maritime studies in its wide range of possibilities (Humanities, Engineering, Experimental Sciences, Social and Judicial Sciences) (<http://bit.ly/2cJAc7L>).
- ▶ **CEI-MAR Stamp of Excellence.** In the year 2015 **CEI-MAR** created the **CEI-MAR Stamp of Excellence**, the purpose of which was to "become a benchmark certificate, on both national and international levels, that reinforces the recognition of institutions committed to teaching, research, knowledge transfer and innovation in marine and maritime fields. To do this, the institution becomes identified with **CEI-MAR**, favouring its

incorporation to the internal activities of the Campus and the institutions that make it up and making it party to the partnership model that **CEI-MAR** has designed." (See Regulations in the Annex). Thus, those institutions (Universities, Research Centres, Companies) that have made special contributions to the Campus of Excellence and who have established working links with the Consortium are distinguished and given a special participation channel, through two figures:

1. **CEI-MAR Exemplary Institution Stamp**, representing the maximum level of collaboration and recognition from the Campus of Excellence, due to the intensity of the relationships established with the distinguished institution, and that meet a determined number of items from the protocol (regarding teaching, research, knowledge transfer and dissemination to society).
2. **CEI-MAR Collaborating Institution Stamp**, representing a less intense, although equally qualified, level of collaboration with the Campus, with a lower number of items met.

The **CEI-MAR Stamp of Excellence** has been conceived as a tool that serves, among other things, to internationalize teaching and allow the most important members of excellence at an international level to be identified by its awarding, those



Within its internationalisation strategy, CEI-MAR awarded the Seal of Excellence to renowned institutions such as the UNAM, Mexico (left) or the University of Ferrara, Italy (right)

which, thanks to their prestige and quality, have joined the **CEI-MAR** project, with agreements for double degrees or jointly delivered degree courses, especially in the field of postgraduate studies. It is therefore, a tool that since the moment of its conception has been used very selectively and only awarded by agreement of the **CEI-MAR Foundation** board in a plenary session.

The structural and strategic nature of this tool is made evident by the fact that only two Stamps of Excellence have been awarded up until now. In concordance with the **CEI-MAR** internationalization strategy, that prioritizes its consolidation in the European Higher Education Area (EHEA) and the Latin American Research Area (EILAC), it has up until the present awarded its Stamp of Excellence as an Exemplary Institution to two higher education institutions, one in each geographical region: the Università degli Studi de Ferrara (Italy) and the National Autonomic University of Mexico (UNAM), in recognition of their history of collaboration and their strategic roles in the development of **CEI-MAR** in the fields to which each of them belong (<https://goo.gl/M6LkqM>; <https://goo.gl/dOUx8J>).

- **Network of networks.** Finally, the constitution of the **CEIMARNET** network must be noted, which brings together the Spanish Campuses of Excellence in marine-maritime studies, and is made up of **CEI-MAR**, the Campus do Mar (North Atlantic, Galicia and North of

Portugal), the Campus Mare Nostrum (Mediterranean, Murcia) and the Campus Atlántico Tricontinental (Atlantic, Canarias).

- **Geographical Fields.** Regarding the geographical fields of interest for **CEI-MAR**, for its international development strategy the Campus has identified as the first spaces to be developed: in the first place, and preferentially, the European field within the European Higher Education Area (EHEA). The quality and solvency of the European Universities, their international prestige, common criteria and the mutual recognition of qualifications, the common system of ECTS credits, the fact that the European universities that founded **CEI-MAR** already have an extensive and established participation in the Erasmus programme and the possibility of taking part in European academic cooperation programmes (principally Erasmus+ schemes, but also the INTERREG, POCTEFEX programmes) make the EHEA a natural and preferential area for international teaching cooperation for **CEI-MAR**, having oriented an important part of their internationalization efforts towards this area.

At the same time, North Africa, due to its geostrategic position in the Strait of Gibraltar, straddling the Atlantic Ocean and the Mediterranean Sea, and the composition of the partnership itself (where AbdelMalek Essaadi University is a founding member of



CEI-MAR developed international courses such as the one delivered at the Federal University of Siberia (left) and it is the benchmark institution in postgraduate and doctorate training for the Ecuatorian Navy (right, signing of the agreement)

the Campus of Excellence since its approval in 2011), is a second geographical area for immediate international exposure. The existence of established relationships, not only with this university, but also with universities in *Morocco* –in which AbdelMalek Essaadi University can act as a bridge -, Algeria and Tunisia in the case of the TEMPUS schemes and, currently, KA2, lays the **foundations** to establish academic cooperation networks that allow the attraction of talent to **CEI-MAR** courses, student and teacher mobility, the application for KA2 academic cooperation projects (mainly in the fields of “Capacity Building” and “Knowledge Alliances”) that help in the development of Marine Studies in the South Mediterranean. Thus, **CEI-MAR** aims to become a reference point for marine-maritime studies in the Mediterranean.

Latin America is the third geographical area where **CEI-MAR** has carried out important internationalization work with the aim of becoming a reference point in the attraction of talent. The so-called Latin American Research Area (EILAC) has the advantage of using the same language, which aids international mobility and an extensive history of institutional relationships between **CEI-MAR** and Latin American universities. All of this enables international mobility, double degree agreements or application for Erasmus+ academic cooperation projects. In addition, the EILAC

brings together some of the best universities in the world (e.g. the National Autonomic University of Mexico) and, furthermore, university systems where the development of marine-maritime science is in its early stages and where **CEI-MAR** can play an important role in its implantation process and can contribute significantly to the socio-economic development of the regions.

Finally, in a medium term future, once relationships have been established in other regions, the United States and Canada make up the second stage of the plan, as the next area to be consolidated in terms of establishing links and cooperation agreements. This process has already started, as is described in the next section, with established agreements being consolidated and new strategic ones being set up. In this field, one of **CEI-MAR's** objectives is to become a major front line player in marine-maritime studies in the world, obtaining and consolidating teaching agreements with two countries that have some of the most internationally prestigious institutions in marine-maritime studies.

2.- INTERINSTITUTIONAL TEACHING COMMISSION PROGRAMMES

The Interinstitutional Teaching Commission, presided over by the University of Huelva, has held a



steady rhythm of face-to-face and virtual meetings in different universities belonging to the partnership since its constitution and this has helped to consolidate the structure of the International Doctorate School **EIDEMAR** and to undertake new programmes that have permitted the creation of a range of specific courses with important international scope, in addition to those already in existence at each University.

- **Offer of EIDEMAR modules in English.** Conscious of the importance of teaching in this language for good international exposure and for the attraction of talent on a global level, the International Doctorate School **EIDEMAR** has designed and introduced teaching modules taught exclusively in English in the different doctorate programmes. These courses are coordinated and taught jointly by teaching staff belonging to the partnership's universities and PRIs, with

a wide selection available in the four doctorate programmes. These courses deal with aspects of biogeochemistry, the ecology of coastal systems, production and productivity, port management and maritime transport, international maritime law or maritime archaeology. This offer is extended and enriched by the courses of the International Summer School, part of **EIDEMAR** – the range of courses is described further on in this section -, which are also recognised within the different doctorate programmes, along with the Erasmus Mundus WACOMA doctorate programme teaching modules, and the Erasmus Mundus MACOMA and EMQAL Masters' programmes. All of this makes up the joint specific range of 150 **CEI-MAR** courses taught in English by both teaching staff belonging to the Campus of Excellence and professionals of international prestige from foreign Universities mainly from Europe and the USA.

PROGRAMME	SPECIALIZATION COURSE Directors, Department and Institution	Hours
CTM	BIOGEOCHEMISTRY AND MICROBIAL ECOLOGY OF COASTAL ECOSYSTEMS Director(s): Alfonso Corzo (Biology, UCA), A. Gómez-Parra (Chemical-Physical Sciences, UCA)	50
RM	LARVITA13 Director(s): Sofia Engrola (UAlg), Claudia Aragão (UAlg), Luis E.C. Conceição (SPAROS), Manuel Yúfera (ICMAN-CSIC), Juan Miguel Mancera (UCA)	50
GCM	PORTS MANAGEMENT Director(s): Francisco Piniella (Sciences and Techniques in navigation, UCA), M. Mar Cerbán (General Economy, UCA)	25
HAM	PORTS IN ANTIQUITY. HISTORICAL AND ARCHAEOLOGICAL APPROACH Director(s): Alicia Arévalo (History, Geography and Philosophy, UCA), Darío Bernal (History, Geography and Philosophy, UCA)	25
CTM	METHODS OF ESTIMATION OF PRIMARY PRODUCTIVITY IN COASTAL ECOSYSTEMS Director(s): J. José Vergara (Biology, UCA), F.Xavier Niell (Ecology, UMA), Isabel Reche (Ecology, UGR)	50
RM	EVOLUTIONARY BIOINFORMATICS 2: INTRA-SPECIES ANALYSES Director(s): Laureana Rebordinos (Biomedical, Biotechnology And Public Health, UCA), Gonzalo Clarós (Molecular Biology and Biochemistry, UMA)	25
GCM	SPAIN, THE EUROPEAN UNION AND THE LAW OF THE SEA Director(s): Alejandro del Valle (Public International Law, UCA), Inmaculada González (Public International Law, UCA)	25
GCM	MARITIME TRANSPORT Director(s): Francisco Piniella (Sciences and Techniques in navigation, UCA), M. Mar Cerbán (General Economy, UCA)	25

Nota. CTM: Doctorate programme in "Marine Science and Technologies"; RM: "Marine Resources"; GCM: "Management and Conservation of the Sea"; HAM: "Maritime Archaeology and History".



► Assignment and consolidation within the academic offer of **EIDEMAR** (see section A.5) of the Masters' Degree **JMD Erasmus Mundus "Water and Coastal Management (WACOMA)"** (see section A.1), delivered by the Universities **CEI-MAR** of Cadiz (coordinator) and the Algarve, together with the University of Bologna. In the consortium, as well as the Hydrometeorology Universities of San Petersburg (Russia), with whom there is an agreement for a double Masters' Degree in Oceanography and in Integrated Management of Coastal Areas, the

University of Santa Cecilia (Brazil) and the University of Ningbo (China) also participate. This Masters' Degree is a two-year course (120 credits) with a compulsory module of one semester at the University of Cadiz and another at the University of Bologna during the first year. This Masters' Degree has formed part of the **CEI-MAR** academic offer since its constitution as a Campus of Excellence (academic year 2012-2013). During this period, the Masters' course has received a total of **41 international students from 24 countries:**

	2012/2014	2013/2015	2014/2016	2015/2017
Countries	Albania, Germany, Armenia, Brazil, China, Ethiopia, Spain, Kenya, Russia, Tunisia, Turkey	Argentina, Bangladesh, Brazil, Spain, Italy, Kenya, Poland, United Kingdom, Tunisia	Brazil, China, Italy, Spain, Morocco, Serbia, Syria	Germany, Bangladesh, Chile, Costa Rica, Egypt, Spain, Iran, Nigeria, Uzbekistan
Students	12	10	7	12

► Assignment and consolidation within the academic offer of **CEI-MAR** of the **JMD Erasmus Mundus "EJM in Quality in Analytic Laboratories (EMQUAL)"** (Ficha A.1), delivered by the **CEI-MAR** universities of Cadiz and the Algarve (coordinator), together with the Universities of Barcelona (Spain), Technological of Gdansk (Poland) and Bergen (Norway). The Novosibirsk State University (Russia), the Central South University (China) and the University of Sao Paulo (Brazil) also participate in the consortium. The Masters' Degree is of two years duration (120 credits) with a rotatory face-to-face module between the European Universities of the consortium. This Masters' Degree has made up part of the **CEI-MAR** academic offer since its constitution as a Campus of Excellence (academic year 2012-2013). During this period, the Masters' Degree has received a total of **41 international students from 25 countries.**

Campus Do Mar and Campus Tricontinental), and which was first offered in the 2015-16 academic year (see section A.1). This Masters' Degree, totally adapted to the EHEA, aims to become a reference point Masters' Degree in Europe, with a multidisciplinary and interdisciplinary approach. Its international exposure, supported by the **CEIMARNET** network, will make it one of the essential reference point Masters' Degrees in the field, allowing research collaboration between the Marine Campuses of Excellence through the master's thesis projects and reinforcing the international exposure and dissemination of the **CEI-MAR** academic offer.

► **Interuniversity Masters' Degree in Oceanography.** This is a new interuniversity Masters' Degree designed within the framework of the **CEIMARNET** network to be delivered by the Universities of Cadiz, Las Palmas de Gran Canaria and Vigo (Campus of Excellence **CEI-MAR**,

► **Double Masters' Degree agreement with Ferrara.** The University of Cadiz and the University of Ferrara maintain fluid collaboration between the "Masters' Degree in Integrated Management of Coastal Areas (GIAL)" see section A.1) and the "Laura Magistrale in Scienze Geologiche, Georisorse e Territorio" of the UniFE, which has meant a double Masters' Degree agreement in the **CEI-MAR** field.

► **Double Masters' Degree agreement with the Hydrometeorology State University of San Petersburg (Russia)** between the University Masters'



Degrees in "Oceanography" and in "Integrated Management of Coastal Areas" of the UCA and the Masters' degrees in "Physical Oceanography", "Fishing Oceanography" and "Marine Activity and Integrated Management of Coastal Areas" (see section A.1). The students effected this mobility through the Erasmus+ KA107 bilateral agreements (see section A.6) or with the internal funding of each of the two universities.

- ▶ Inclusion and consolidation within the academic offer of CEI-MAR of the Doctorate programme

JEM "Marine and Coastal Management (MACOMA)" (see section A.1), delivered by the CEI-MAR Universities of Cadiz (coordinator) and the Algarve, together with the University of Aveiro (Portugal) and Bologna (Italy). The Hydrometeorology University of San Petersburg, as well as the JMD WACOMA University participate in the consortium. It has been part of the International Doctorate School EIDEMAR since its creation. This Masters' Degree has received a total of **36 international students from 19 countries:**

YEAR/ STUDENTS	2012-2015	2013-2016	2014-2017	2015-2018
Countries	Bangladesh, Croatia, Spain, Ethiopia, Italy, Portugal, Russia, Sri Lanka	Germany, Belorussia, Brazil, Canada, Spain, India, Islas Fiji, Kenya, Mexico, Portugal, Serbia, Taiwan	Brazil, Canada, Spain, Italy, Kenya	Argentina, Bangladesh, Brazil, Italy, Portugal, Russia
Students	10	13	7	6

- ▶ **Joint Doctorate agreement between the University of Ferrara** and the EIDEMAR "Marine Science and Technology" doctorate programme (see section A.1).
- ▶ **Marine Science Doctorate Programme** with the Universities of Colombia and Ecuador, in collaboration with the Latin American University Postgraduate Association (AUIP) and the Andalusian Regional Government. The objectives of this programme are to promote the training of specialized professionals in these countries, to contribute to the consolidation of the Latin American Research Area, the construction of research ties by means of the doctoral theses carried out, the attraction of researchers and the consolidation of CEI-MAR as a reference point for marine-maritime studies in all of the Latin American area. The programme will be implemented during the 2016-2019 period, starting with a training seminar in Ecuador, followed by the start of the theses. The doctoral school EIDEMAR has organized this programme, in collaboration with the AUIP and with funding from the Andalusian

Regional Government, to train 15 doctors in the EIDEMAR doctorate programmes, from the Universities **Simón Bolívar** (Colombia, 6 doctorate students), **Laica Eloy Alfaro de Manabí** (Ecuador, 6 doctorate students) and 3 more doctorate students from Latin American Universities belonging to the AUIP. The doctorate students are all teaching staff from the participating universities, thus this programme will play an important role in training specialized teams in the counterpart universities.

- ▶ **National Autonomic University of Mexico (UNAM)**. The UNAM has become a strategic partner of CEI-MAR in Latin America. The Framework Collaboration Agreement initially signed in 2013, has been followed by the signing of a specific collaboration protocol with the Institute of Marine Science and Limnology for collaboration in Marine Science and Aquaculture field, promoting the establishment of double degree agreements, student and teacher exchanges, joint oceanographic campaigns and the holding of a biannual international conference and the concession, in



November 2015, of the first **CEI-MAR** Stamp of Excellence as a **CEI-MAR** Exemplary Institution, recognising the central role of the UNAM in the strategic development of **CEI-MAR** in the Latin American Research Area (EILC). Equally, in March 2016 a similar collaboration protocol was signed between **CEI-MAR** and the Linguistics Institute of the UNAM, which is the body responsible for the development of subaquatic archaeology studies, and which looks like being the second short-term major collaboration area between the two institutions. This close collaboration with the UNAM is reflected by its participation as a partner of the University of Cadiz in the first edition of the **Erasmus+ KA107 projects 2015-2016**. Within the framework of this project, teachers and students from the UNAM visited Cadiz during this academic year, which has helped to launch collaboration lines in the field of Renewable Marine Energies. Currently work is underway to set up double Masters' Degrees and agreements for double doctorates in the fields of aquaculture, physical and biological oceanography and maritime and subaquatic archaeology.

- ▶ **International Summer School (ISS)**. In operation since the year 2014, the ISS of **CEI-MAR** was conceived with the aim of becoming a reference point for specialized studies and a meeting and collaboration platform for Masters' and doctorate students and professionals in all the marine-maritime subjects of the five areas of knowledge that **CEI-MAR** has been working on since its beginnings. The objective of the courses is to be a meeting point for very specialized courses of excellence in each of the **CEI-MAR** subject areas and attract international students from all over the world and become an international platform for teachers and students alike to meet. Each course, which is delivered integrally in English, has a coordinator from one of the **CEI-MAR** universities and a team of renowned professors from other countries. The courses are offered, delivered and organized by different universities

from the Consortium within the **ISS-CEI-MAR** framework and receive the crossed participation of professors and, in addition to foreign students, students from the different **CEI-MAR** universities.

Over the course of these three editions, over 60 specialists from 11 countries have taught classes in English to over 250 students from 15 countries, with the great majority being international students. After the first edition organized in Cadiz, the **ISS-CEI-MAR** has adopted a multi-campus format in which the different universities from the partnership submit proposals which are developed on each Campus and in which the mobility of students between the campuses is promoted **through a grant programme**, at the same time as aiming to boost the attendance of foreign students. During these three editions, world experts in very diverse fields of study from 10 countries have passed through the **ISS-CEI-MAR** and the total number of students has been approximately 250, from 15 countries.

Among the invited teaching staff, the participation of some especially relevant teachers and universities must be noted. In the United States region, a special mention must be made to the contribution of the University of Massachusetts in Boston (UMass-Boston) and that of the University of Boulder-Colo- rado. The UMass-Boston offers, through its *School for the Environment*, degree, masters and doctorate programmes in environmental Sciences, Marine Science and Technology and Marine Science that fit in perfectly with the **CEI-MAR** programmes. The courses delivered during the two editions have been institutionally organized by the Dean's Office of this school and have permitted in addition, the presentation of project proposals to NASA and the NSF, the start of the design of double Masters' Degree agreements and double Doctorate agreements. On the part of the University of Colorado-Boulder, the participation of Professor W. J. Emery is especially notable,



one of the highest authorities worldwide in Physical Oceanography and in the application of remote sensors and satellites in its study.

In Europe, the participation of the Universities of Southern Denmark (*Denmark*), Radboud University Nijmegen (Holland) and of the Vasa Museum in Sweden, among others, must be highlighted.

Professor Ole G. Mouritsen (Southern Denmark University), is a specialist in the biophysics of membranes and also known for his work on taste receptors – especially the fifth taste, umami- and algae. His participation in two editions of the ISS-**CEI-MAR** has led to the organisers of the course publishing a book "Can we eat seaweed?" (ISBN: 978-84-9828-567-3), a complete compendium of the biology, history and gastronomical applications of algae, in which 17 Spanish chefs with fifty Michelin stars (Angel León, Arzak, Martín Berasategui, Subijana, etc.) participated and which is touted to become a teaching reference manual for specialized courses. The book, which was originally published in Spanish, is currently being translated into English.

In the field of Aquaculture, the University of Radboud in Nijmegen, and in particular Professor Gert Flick, a renowned expert in the field of animal ecology and physiology, are

notable, both for their renowned prestige and for their continuous collaboration over the last three editions of the ISS-**CEI-MAR** and the mobility of teaching staff and students under the Erasmus programme.

Finally, also worthy of a special mention are the courses delivered in the field of Subaquatic and Maritime Archaeology, which reinforce the international exposure of the **EIDEMAR** doctorate programme in Maritime History and Archaeology and the Masters' Degree in Nautical and Subaquatic Archaeology. In this field, a special mention must also be made of the participation in this edition of the Director of Research of the Vasa Museum in Sweden, which joins other institutions such as the Maritime and Naval History Laboratory in Italy.

Thanks to all of this, the ISS-**CEI-MAR** has been confirmed and consolidated as an instrument for the internationalization of the Campus of Excellence courses, as an excellent collaboration platform from which other teaching and research projects can be launched, and as an advertisement for the **CEI-MAR** courses and potentiality which will attract talent to its postgraduate programmes.



More than 300 students from the 5 continents were trained during the 3 CEI-MAR International Summer School editions



Year	Course	Teaching staff
2014	"Beaches: everything you always wanted to know about them but were afraid to ask"	United States, Spain, Italy, Turkey
	"Ocean acidification and biomineralization"	University of Boston at Massachusetts, United States
	"The amazing world of seaweeds: an unforgettable journey from Biology to Gastronomy"	Spain, Denmark, Holland, Portugal
	"Aquaculture in Southern Europe: basic and applied aspects"	Spain, Holland, Portugal
2015	"Ocean acidification and biomineralization"	University of Boston at Massachusetts, United States
	"Data Analysis methods in Oceanography"	Spain, United States
	"Aquaculture in Southern Europe: basic and applied aspects"	Spain, Holland, Portugal
	"Origin and development of Naval Architecture"	Spain, United States, France, Portugal
	"Maritime migration and human-rights in the Mediterranean"	Germany, Spain, Italy
	"Coast Tools: Building up knowledge on Coastal Processes: Principles & Techniques"	Spain, Portugal
2016	"Estuarine and nearshore systems: from fundamentals to cutting-edge Knowledge"	Spain, United States, Holland, Italy, United Kingdom
	"Ocean Technology"	Spain, Portugal
	"Aquaculture in Southern Europe: basic and applied aspects"	Spain, Holland, Portugal
	"Oceanografía Aplicada y Gestión Integrada de Áreas Costeras en el Entorno de Galápagos"*	Ecuador, Spain
	"Remotely piloted aircraft systems as a tool for research in Natural Sciences"	Spain
	"Introduction to Naval Artillery and its Historical Meaning"	Spain, Italy, Norway, United Kingdom
	"Effective Communications Skills for Scientists"	Spain, Holland

* The course "Oceanografía Aplicada y Gestión Integrada de Áreas Costeras en el Entorno de Galápagos" is the only one that has been taught in Spanish, given that the public it is mainly directed at is doctorate students, managers and teaching staff from the Pacific coast of Latin America.

► **Navy Oceanographic Institute of Ecuador (INOCAR).** Within the actions of CEI-MAR in the EL-LAC, it has been made a priority to reach agreements with not only academic institutions but also those involved in the teaching and management of marine resources in its wider sense. Thus, CEI-MAR has signed an agreement with the Navy Oceanographic Institute of Ecuador (INOCAR) to include its officials in the CEI-MAR masters and doctorate programmes. The agreement contemplates, therefore, the organization and delivery of specialization courses for Chiefs of Staff and other Navy personnel, in different subjects related to Coastal Management, Oceanography, Aquaculture, Safety, International Politics, International Marine Law,

among others. In this field, two activities were organised in July 2016: the course "Applied Oceanography and Integrated Management of Coastal Areas in the Galapagos", to be taught in the Galapagos Islands jointly between the INOCAR and the University of Cadiz; and a second specialization course in Coastal Management, directed specifically at INOCAR personnel, which will take place in Guayaquil after the previous one. Thus, CEI-MAR and EIDEMAR open a new line of international exposure work that includes the organization and teaching of courses in places outside the geographical framework of the Campus (Andalusia, Algarve and Tangiers-Tetouan in Morocco) (<https://goo.gl/1qML5u>).



3.- OTHER SINGULAR AND SPECIFIC TEACHING PROGRAMMES

As a result of the international network of contacts and alliances that CEI-MAR has formed during its development, a series of one-off teaching programmes has been produced with very specific contents and subjects. They have been run as the response of CEI-MAR to the training demands and proposals of its members, and have different formats in the teaching field: courses, seminars, conferences, etc. An important part of these programmes has been channelled through the International Doctorate School of the Campus of Excellence, EIDEMAR (see section A.5) and show the power and gradual extension of its alliances.

These programmes can be divided into two main areas: collaborations within the doctorate programmes that enable the internationalization of these programmes through the mobility of students and collaboration between CEI-MAR thesis supervisors and those of their partners; and specific courses and seminars organized on demand or in collaboration with the CEI-MAR partners.

Postgraduate teaching and research, especially in doctorate studies, are very closely linked. In the collaboration section are included those institutions and countries with which teaching relationships have already been established through the realization of doctoral theses by the EIDEMAR doctoral school students, who carry out part of their training activities in these institutions, normally within the framework of joint research projects with CEI-MAR institutions. These collaborations are mainly carried out with universities in Europe and the United States, with which the CEI-MAR researchers have established academic and scientific cooperation ties. In Europe, a special mention must be made of the Universities and Research Centres in Germany (Albert-Ludwigs Universitaet Freiburg, Alfred-Wegener Institute; University of Oldenburg, the Helmoholtz Centre for Ocean Research in Kiel-GEOMAR-), in France (University of Western Brittany, Universi-

ty of Toulon, the Villefrance sur Mer Oceanography Laboratory, or the Biology Station of Roscoff belonging to the CNRS), in Denmark (Technical University of Denmark, University of Aarhus), in Holland (Royal Netherlands Institute of Sea Research, University of Radboud-Nijmegen, University of Amsterdam, HZ Delta Academy, Deltares Institute), in Israel (University of Haifa), in Italy (University of Lecce-Salento, University of Palermo, University of Milan, University of Naples, or the Anton Dhorn Biology Station), in Norway (University of Bergen), in Portugal (Aveiro and Nova Lisboa), in the United Kingdom (University of Cambridge, University College of Cork, University of Warwick and University of Plymouth), in Romania (National Institute for Marine Geology and Geoecology) and in Sweden (Universities of Goteborg and Upssala), to list some of the most important from an long list that is not exhaustive. In the United States, a special mention must be made to the collaborations with the Scripps Institute of Oceanography, University of Southern California, Woods Hole Oceanographic Institution, University of Boston-Massachusetts, University of Southern Mississippi and DePaul University Chicago.

In the second section, a very significant proportion of these seminars have as target and recipient the countries of Latin America, with which the CEI-MAR universities maintain strong links via cooperation networks, such as the IBERMAR network, bilateral alliances or the PIMA networks, sponsored in the field of the Organization of Ibero-American States, OEI. Among the programmes carried out, the following must be highlighted:

- ▶ International specialization course in "The Environment and Global Change" with the Federal University of Siberia (Russia) financed by CEI-MAR and the Banco Santander Environment professorships (Link to the news item CEI-MAR: <http://goo.gl/qLVSI>).
- ▶ Simón Bolívar University, University of the Atlantic, University of la Costa and the Navy Sub-official School ARC Barranquilla (<http://goo.gl/Cj7dM>), in the collaboration



framework of the IBERMAR network. Seminar on Integrated Management of Coastal Areas in the Latin American Area (Prof. Dr. Pedro Arenas, Department of History, Geography and Philosophy, UCA. August 2012).

- ▶ Autonomic University of Honduras (<http://bit.ly/2d1kMLI>). Workshop on Coastal Dynamics: Coastal Geomorphology and Management and Dynamics of Coasts: Evolution (Prof. Dr. Javier Benavente, Department of Earth Sciences, UCA); Approximation to a Biophysical and Socioeconomic Diagnosis of the Marine Coastal Region of Honduras (Dr. Juan Carlos Carrasco, INCEBIO); and Impacts of marine intrusion in the Barras del Motagua and Cuyamel communities (Dr. Roger Flores, Conservation Bodies). Coastal Risks, Methods of study: open round table on the problems in Motagua and Omoa. Autonomic University of Honduras, 22nd and 23rd of October 2012.
- ▶ Autonomic University of Honduras. Conference: Classification of coasts and Coastal Risks in Honduras. Prof. Dr. Javier Benavente, UCA .
- ▶ University Federal do Rio Grande do Sul, Brazil (<http://goo.gl/bLUFdN>): Seminar on "Coastal Morphodynamics. Comparative analysis of the coasts of the south of Spain and Brazil" (Prof. Dr. Giorgio Anfuso Melfi, Department of Earth Sciences, UCA).
- ▶ Seminar on "Coastal Risks and Vulnerability" in collaboration with the Juárez Autonomic University of Tabasco and the UNAM. 65th Summer Courses of the UCA. 2014 (<http://bit.ly/2chgEW9>).
- ▶ Seminar on "Blue Economy I". 65^o 65th Summer Courses of the. 2014 (<http://bit.ly/2cxtsZb>).
- ▶ Participation on the course "Climate Change and Coastal Wetlands: their role in the atmospheric exchange of greenhouse gases and their impact on ecosystemic ser-

vices provided by these environments" organized by the International University Menéndez Pelayo in Seville, coordinated by the ICMAN-CSIC researcher Emma Huertas and with the participation of CEI·MAR researchers (<https://goo.gl/NciRHF>).



ROLE OF MEMBERS OF THE PARTNERSHIP

The programmes carried out have been run with the participation of the universities belonging to the partnership, as has been described in each of the different programmes carried out. The constitution of the Teaching and Internationalization sub-commissions has meant a qualitative leap in the integration of the member Universities and PRIs, as they have created a collaborative area in which it has been possible to programme and share out tasks and projects. These commissions, presided over by the Universities of Huelva and Almeria, have played a fundamental role in establishing new agreements and understandings, the assignation of Erasmus Mundus Masters' Degrees to CEI·MAR, the design of the interuniversity Masters' Degree in Oceanography within CEIMARNET, the range of courses available in the *International Summer School* and their dissemination on and off Campus or application for teaching projects within the framework of the Erasmus+ programme (see section A.6).

All of the institutions belonging to the consortium have participated, through the working sub-commissions, in the design of the EIDEMAR range of courses, and especially in the design and teaching of the learning modules, both those taught in Spanish and those taught in English. The Universities of the Algarve and of Cadiz collaborate in the Erasmus Mundus WACOMA and EMQAL Masters' Degrees and in the Erasmus Mundus MACOMA doctorate programme. In addition, the Universities of the Algarve, Cadiz, Granada and Huelva have offered courses within the ISS-CEI·MAR. All of this demonstrates the progressive in-



volvement and coordination of all of the members in this joint project. It is true that there is still a long way to go in the field of coordination of the programmes, but it is undeniable that the integration of the member universities is now solid and has allowed us to design a new internationalization strategy for the new period ahead after the final evaluation of the Campus of Excellence.



MOST SIGNIFICANT RESULTS

As has been indicated in the previous sections of this chapter, two types of achievements must be noted: those directed towards providing structures and tools that allow the design and running of projects and the projects and programmes themselves.

Among the former, the setting up of the Teaching and Internationalization interinstitutional sub-commissions must be highlighted, which with their steady rhythm of face-to-face and virtual meetings and permanent contact between the vice-rectors and international relations staff and staff from the Campus of Excellence through the TICs have enabled the programmes mentioned above.

From the latter, a tool that must be noted is the **CEI-MAR International Summer School** which has enabled the Campus to position itself as a benchmark in specialized marine-maritime studies and has become a collaborative area for teachers to meet, for the popularization of **CEI-MAR** and its potentialities, and for the attraction of talent to postgraduate programmes.

In third place, the definition of the **CEI-MAR Stamp of Excellence** must be mentioned, to link those institutions of excellence that stand out for their involvement and participation in the **CEI-MAR** project and that have already shown their efficiency with the first two Stamps awarded, one in the European Higher Education Area EHEA and the other in the Latin American Research Area EILAC.

Finally, and although it is not a specific object of this section, we cannot forget to mention as one of the main tools, the International Doctorate School **EIDEMAR** itself, from where many of the programmes detailed here have come and which undoubtedly, is one of the most important achievements of **CEI-MAR**, as it joins a vocation for international teaching of excellence with front line research through the realization of joint doctoral theses, international doctorate programmes and Erasmus Mundus. Likewise, it is a driving force for development in those regions without doctors in the field, through the training of qualified professionals and teaching staff who will work in their area of origin once they have finished their studies.

As a result of the application of these tools, one of the tangible results that must be noted is the wide range of **EIDEMAR** learning modules in English, both within each doctorate programme, and those offered through the Erasmus Mundus masters' and doctorate programmes and the *International Summer School ISS-CEI-MAR*, that add up to over 150 courses and learning modules.

Thanks to their international prestige and the high level of competition needed to attain and renew them the Erasmus Mundus "Water and Coastal Management – WACOMA" and "Quality in Analytical Laboratories – EMQAL" Masters' Degrees and the Erasmus Mundus "Marine and Coastal Management – MACOMA" doctorate programme, that join the joint doctorate agreement with the University of Ferrara and the **EIDEMAR** doctorate programme in Marine Science and Technology, must also be noted.

In this field, we must highlight the double degree agreements for **CEI-MAR** Masters' Degrees in "Oceanography" and in "Integrated Management of Coastal Areas" and Masters' Degrees in "Physical Oceanography", "Fishing Oceanography" and "Marine Activity and Integrated Management of Coastal Areas" reached with the Hydrometeorology University of San Petersburg, and which are delivered in this speciality at the Faculty of Oceanography of the UERHM. Likewise, the double de-



gree agreements for Masters' Degrees between the Masters' Degrees of "Integrated Management of Coastal Areas" and the "Laurea Magistrale en Geo-risorse" with the University of Ferrara.

In the new courses section, a special mention must be made of the interuniversity Masters' Degree in "Oceanography", delivered between the three Marine Campuses of Excellence in Spain in the framework of the **CEIMARNET** network, which has positioned this Masters' Degree as a national reference point with great international exposure.

In the field of the Stamp of Excellence it is important to note the awarding of the Exemplary Institution Stamp to the Universities of Ferrara and the National Autonomic of Mexico, for the commitment shown to **CEI·MAR** and the double degree agreements reached or underway in different areas (Aquaculture, Subaquatic Archaeology, Integrated Management of Coastal Areas, Oceanography).

Finally, it is important to note the work in training doctors that **CEI·MAR** is carrying out in Latin America and that has can be seen in the different research personnel training agreements and, particularly, in the Marine Science doctoral training programme run with the Universities of Colombia and Ecuador, sponsored by the Latin American University Postgraduate Association –AUIP– and with funding from the Andalusian Regional Government.

As a result of this work, **CEI·MAR** has set up teaching collaboration relationships with over 100 international higher education institutions, mainly in Europe, followed by Latin America, the United States, North Africa and Russia, which demonstrates the potential of **CEI·MAR** to become a benchmark leading player in the field of marine-maritime studies.



INTERNATIONALIZATION ACTIVITIES

CEI·MAR has been presented on different international forums and has carried out internationaliza-

tion activities, both outside its borders and in what is known as "Internationalization at home".

The elaboration of marketing materials (leaflets, flyers and videos) to present and popularise **CEI·MAR** has been one of the first tools used to make **CEI·MAR** known on the international scene. This material, coupled with the support of a powerful bilingual Spanish/English website has allowed **CEI·MAR** to be presented on numerous forums.

In the international teaching field, **CEI·MAR** has been presented and made known in some of the most important Higher Education Fairs in the world: NAFSA (from 2012 to 2016) and EAIE (2014 and 2015, and its offer will be presented again upcoming Liverpool Fair in September 2016). Likewise, **CEI·MAR** has been presented specifically in different Higher Education and Research Ministries in Latin America: the Ministry of Science, Technology and Productive Innovation in Argentina, which has allowed the signing of a collaboration agreement in the framework of the development of the Argentinian project "Pampa Azul" to develop the sustainable exploitation and study of the sea, and has allowed participation in the Becas. Arg grants programme; the Government Ministry of Productivity and the Navy Oceanography Institute of Ecuador, which has resulted in specialised personnel training agreements (Masters' and doctorate programmes).

Furthermore, the **CEI·MAR** project has been presented in numerous European, North American and Russian universities through institutional trips made by the vice-rectors of international relations and teaching, by trips and visits made by the teachers themselves who have been provided with the necessary tools (videos, power point presentations, pen-drives and printed material), and institutional visits by delegations from Europe, North America, South America, North Africa and Russia to **CEI·MAR** universities.

In this way, **CEI·MAR** has been presented at international events and Congresses (eg., ASLO, Euromarine, NAFSA, EAIE), to public bodies, universities and research centres, with the aim of



obtaining new collaboration projects in terms of mobility of students and teachers, double degree agreements, agreements for co-tutoring and co-management of doctoral theses or for the training of teaching staff and doctors.

In the field of "Internationalization at home", CEI·MAR has worked hard to integrate and run their own programmes within the Erasmus+ programme. These results will be explained in the corresponding section (see section A.6). The In-

ternational Summer School is another important tool of internationalization at home, as it attracts renowned professionals and students and puts them in contact with teachers and students from the Campus of Excellence universities.

All of this has involved extensive work in graphic design, dissemination and presentation that has allowed CEI·MAR to extend its borders with agreements that have made this project a reference point.



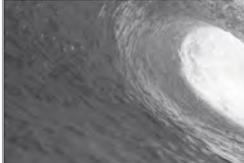
MOST IMPORTANT DEVIATIONS BETWEEN INITIAL OBJECTIVES AND RESULTS OBTAINED

In this case, the programmes carried out fulfil that which was initially planned, with all of the proposed objectives being met, although it must be noted that the concept of international courses implies a process of permanent reviewing, updating and the design of new projects. Nevertheless, it is important to highlight that a solid base has been laid to continue with this activity.

Differences to be noted between the initial objectives and the results displayed in this report include the inclusion of new benchmark objectives, chiefly the creation of stable structures, both in the form of working sub-commissions and that of networks (CEIMARNET), alliances (participation in the AUIP, IBERMAR, cooperation agreements) and instruments (CEI·MAR Stamp of Excellence), that allow better organization and planning of work, optimization of resources and much more powerful international exposure.



SECTION A.3. Innovation in teaching

Strategic area	Improving teaching and adapting to the European Higher Education Area
Programme	Programme for Improvement and Innovation in Teaching
Objectives	<i>To ensure innovation in learning processes and the use of new technologies in teaching.</i>
	<ul style="list-style-type: none"> ▶ Creation of a virtual space for teaching material. ▶ Creation of learning capsules (<i>Virtual Waves of Knowledge</i>). ▶ Teaching innovation projects. ▶ Continuous training programme for teaching staff.

INITIAL OBJECTIVES OF THE 2011 PROPOSAL

The initial objectives were the same as in the previous section.

SUMMARY OF WORK ACCOMPLISHED

The list of programmes described in this section responds to a strategy of linked, transversal objectives, to improve teaching in the **CEI-MAR** academic institutions and the creation of audio-visual teaching resources of excellence in line with the EHEA guidelines.

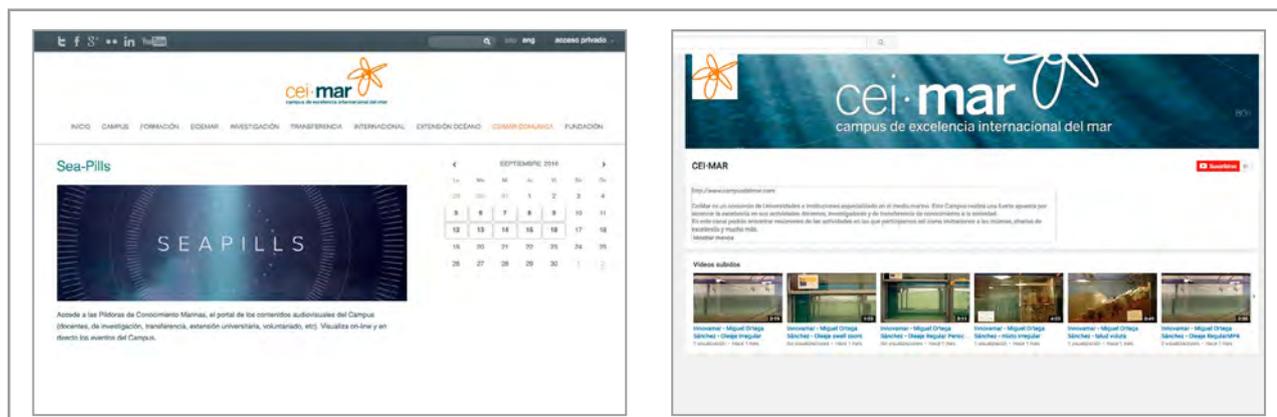
The space planned for audio-visual teaching materials has evolved since the original concept of *Virtual Waves of Knowledge* (SEA-PILLS) from 2011, and it has been extended to cover not only teaching products but also dissemination products. The SEA-PILLS channel contained the first learning capsules with which we started to profile the concept of open audio-visual learning. Available in its full capacity in 2013, it used download software optimized for mobile devices and was divided into 8 modules.

The rapid evolution of technology has had a clear influence on the audio-visual informa-

tion accessed, which made a review and improvements to the initial approach necessary to ensure its sustainability and usability in the long-term. For this reason, **CEI-MAR** organized the move from the concept of SEA-PILLS, initially restricted to a specific technological platform, to the use of a resource that has become very popular and universally used by society, as the optimum medium to play any audio-visual document: the use of the YOUTUBE platform. Thus, all of the audio-visual contents generated by the Campus of Excellence are available on the **CEI-MAR** YOUTUBE channel (<http://bit.ly/2cxvdG2>), which is used as a repository for audio-visual documentation and provides access to the information and guarantees free access to the general public.

After the SEA-PILLS experience, **CEI-MAR** members reviewed and improved strategies to provide the Campus with suitable audio-visual contents both at teaching and dissemination levels, in all of its perspectives. Thus, protocols and instructions were formulated and incentives were proposed to involve teachers and researchers in the design of audio-visual training materials; these resources must be apt to ensure improvements in teaching in the EHEA context. The work done by the members of the partnership is summed up in the 1st Edition of the INNOVAMAR teaching innovation project call.

A.3. INNOVATION IN TEACHING



CEI-MAR used new technologies and social media in its teaching innovation strategy

The INNOVAMAR bases were drawn up with the participation of CEI-MAR university members and established as their main objective that of developing interuniversity projects to create audio-visual contents and tools to improve teaching in all subjects, at any level, belonging to the campus of international excellence.

The participation of members has resulted in obtaining 76 teaching documents that, effectively, can be used for teaching different subjects on the campus and which are openly available to the general public. These documents are not just recordings of academic sessions but each documentary is conceived to take full advantage of the opportunities provided by this form of communication, by definition agile and dynamic in its attention to the public viewing it. Accessible from the CEI-MAR YOUTUBE channel, these audio-visual documents cover topics in the marine-maritime field from the study of technology based on free hardware for the design and construction of scientific instruments (<http://bit.ly/2cXcAzO>), to the analysis of a breaking wave on a sloping coastal sea wall (<http://bit.ly/2d5cuXn>), including dynamic studies on an inclined plane, (<http://bit.ly/2d1mMTX>), the calculation of concentrations in the balance of an electrochemical system (<http://bit.ly/2cByjeb>), the study of diversity in aquaculture farming systems (<http://bit.ly/2cxuOmN>) or the vision that the students themselves have when faced with the challenge of studying biological concepts in a monologue competition (<http://bit.ly/2chid6t>).

In terms of adaptation to the EHEA, CEI-MAR has organized a TED event: TEDxCádizUniversity.

(<http://bit.ly/2chhfa1>). Thus it has participated in creation and knowledge transfer through an international dissemination platform that aims to become a reference point for the campus over the next few years.

In addition to the products generated in the INNOVAMAR project call, since 2013 CEI-MAR has had an open learning service (<http://bit.ly/2c-M4EMQ>) that includes complete short courses in audio-visual format that are offered to the rest of society as self-learning materials. Currently, there are over 400 audio-visual products available aimed at providing the CEI-MAR community with a learning support that allows videoconferences to be set up from different supports, audio transcriptions to be made, e-teaching delivered, 3D modelling with free web tools, or to learn from the opinions of renowned specialised professionals in different fields of knowledge, who were interviewed to give us their opinion on how to write scientific articles or how to tutor doctoral theses. This collection of documentaries is therefore, incidental to the internal activity of CEI-MAR, although it complements it, by offering personnel belonging to the partnership the instruments and training necessary for a better design of the more technical documentaries.





ROLE OF MEMBERS OF THE PARTNERSHIP

The concepts of teaching improvement and adaptation to the EHEA have been thoroughly analysed by members both for the design and the dissemination scope of the CEI·MAR audio-visual document collection and as a motive for the elaboration of the bases for the INNOVAMAR teaching innovation project call.

CEI·MAR teaching staff and students have been the protagonists and authors of the teaching products that have been generated in the first edition of the INNOVAMAR teaching innovation project call.

All of the partnership uses the teaching and training products that have been generated and that are available in the afore-mentioned repositories.



MOST SIGNIFICANT RESULTS

Online open repositories have been designed and made available to all of the CEI·MAR community and to society in general, with teaching and training materials created by teachers and students. CEI·MAR shows that it is technologically and socially adapted to the use of technology that guarantees the dissemination of its courses and its activities, providing universal access with friendly technologies.

The audio-visual documents generated and available in the afore-mentioned repositories keep to an elaboration and production format in accordance with new web-learning trends and with the guidelines for the use of new learning technologies recommended by the EHEA. International models for this type of repository have been taken into account for the instructions for the CEI·MAR channel, which guarantees their adaptation to the most common technical and social standards and their dynamic adaptation to other new possibilities.

The call for and application of INNOVAMAR teaching innovation projects, an interuniversity collaboration area that establishes as its main objective the creation of audio-visual teaching products that can be freely accessed by both members of the partnership and by all of society, constitute an important result being elaborated thanks to interaction and discussion among members.



INTERNATIONALIZATION ACTIVITIES

Audio-visual teaching, training or divulgation resources that have been generated as a result of the programmes described in this section can be freely accessed by both members of the partnership and by anyone who wants to access and learn with them from outside the campus. These are universal contents that guarantee the maximum dissemination of CEI·MAR activities.

International interest in these products is emphasised by the participation of CEI·MAR in the first TEDxCadizUniversity initiative that has carried the influence of the campus of excellence beyond the physical or virtual limits of the partnership, to the target audience that can access this international platform from where ideas worth disseminating arise.



MOST IMPORTANT DEVIATIONS BETWEEN INITIAL OBJECTIVES AND RESULTS OBTAINED

The objectives set in 2011 have been satisfactorily met and have been materialized in the design and execution of a teaching innovation project call (INNOVAMAR) and in the creation of products elaborated for teaching improvements under the precepts of the EHEA.



INNOVAMAR has been the first of the programmes from a policy of teaching innovation that contains additional programmes. Besides the repeat edition of the INNOVAMAR project call, in our provisions for the next few months we have made provisions for a teaching innovation call directed exclusively at university students, teachers and researchers from the CEI-MAR PRIs that contribute from different perspectives to teaching improvements in the Campus of International Excellence.

Once we have the official repository of CEI-MAR teaching materials, over the next few months we face the task of motivating all the members even more to increase both the number of teaching resources available and their quality.



SECTION A.4. Physical adaptation of teaching spaces to the EHEA

Strategic area	Improving teaching and adapting to the European Higher Education Area
Programme	Physical adaptation of teaching spaces to the European Higher Education Area
Objectives	<p><i>To provide and equip quality teaching spaces which ensure that teaching is compliant with the principles of the EHEA through two programmes:</i></p> <ul style="list-style-type: none"> ▶ Adaptation of teaching spaces. ▶ CEI·MAR e-teaching rooms.

INITIAL OBJECTIVES OF THE 2011 PROPOSAL

The initial objectives were the same as in the previous section.

SUMMARY OF WORK ACCOMPLISHED

Below is a list of programmes linked to the improvement of teaching spaces that have set as their main objective the physical adaptation of these spaces to improve teaching in CEI·MAR following the EHEA principles and the incorporation of audio-visual and computer resources to enable online interaction between members.

The spaces adapted for teaching were:

- ▶ Advanced Primary Production Laboratory (University of Malaga). A space for the promotion of marine studies that is a teaching foundation where specialization courses related to primary production are run and which is making room for diverse groups following paths of work tied to EIDEMAR, focused on marine ecosystems. This space, located in the Central Research Support Services (SCAI) as is explained further on in this section, is equipped with additional resources for e-teaching.

- ▶ Classrooms for advanced aquaculture teaching (2) in the Andalusian Centre for Marine Studies, CASEM (University of Cadiz). These are spaces where teaching activities related to the farming of commercial aquaculture species are coordinated with auxiliary cultures. They were prepared to receive guided tours with the aim of showcasing their activities to different social groups (associations, primary schools, secondary schools, among others). These spaces have facilitated teaching activities in new doctorate programmes:
 - ▶ Doctorate in Marine Science and **Technologies**:
 - ◇ Molecular and cellular biology, genetics and genomics of marine organisms.
 - ◇ Microalgal biotechnology.
 - ▶ Doctorate in Marine Resources:
 - ◇ Basic and applied aquaculture.
- ▶ Seminar rooms for the teaching of marine-related humanities (University of Cadiz). These are in the Faculty of Philosophy and Letters, the same as the previous spaces, associated with the International Doctorate School of Marine Studies, EIDEMAR, and the specialization areas of the Campus: *The Sea as a Resource* and *The Cultural Value of the Sea*. These are learning spaces designed for studying and working in

A.4. PHYSICAL ADAPTATION OF TEACHING SPACES TO THE EHEA



CEI-MAR adapted new infrastructures for teaching, as it is the case of the space arranged at the LABIMAR

small groups associated with teaching a doctorate programme in *Maritime History and Archaeology*.

- ▶ Photobiology laboratory –Dermatologic Strengthening (University of Malaga). This space has been adapted for photobiology study and research. Services are provided for users from different sectors: manufacturers, consumer associations, tourist consortiums, public health bodies, etc.
- ▶ Marine classroom (“Aula del Mar”) (University of Granada). Among the objectives proposed are those of channelling, organizing and boosting all the initiatives and activities related with supporting degree and postgraduate courses in the field of the CEI-MAR specialization areas. These activities are projected to the social environment through knowledge transfer. The adaptation of this space has allowed, in addition to the usual running of teaching activities including summer courses, virtual conferences and congresses, the development of teaching innovation projects and the presentation of temporary exhibitions related to CEI-MAR activities.
- ▶ Marine Research Laboratory (LABIMAR). The adaptation of this space has been complex as it is a historical space that was difficult to adapt to the technology required by higher education teaching activities. The amount allocated to this laboratory has been invested in running teaching activities, with an emphasis on the in-

ternational and *streamed* courses discussed in sections A.1 and C.2, and scientific dissemination activities with an open approach, to bring the sea, science and CEI-MAR closer to society.

- ▶ La Esperanza Saltworks (Cadiz Bay Natural Park). The adaptation activities of this space have served to repair and start running all of the physical infrastructure that the saltworks were not using. As a consequence of starting working, this space has served to disseminate a historical professional activity, that has been brought closer to society through scientific dissemination and knowledge transfer activities led by the UCC+i of the University of Cadiz, in projects in which there is a balance between teaching and dissemination of the biological environment and of the procedures involved in obtaining salt. The teaching activities carried out there are discussed in section A.1.

Furthermore, the Campus of Excellence has deployed a strategy for allocating funds to facilitate communication and training based on updated technology and exploratory studies to ensure that the systems being installed were compatible with the future ones in the medium and long term. A large part of the work carried out on communications has been done to enable videoconferencing and e-teaching and has fostered the creation of a large virtual classroom used as a teaching resource by the CEI-MAR community. In this way, we break down not only barriers of time and space that make communication between universities difficult, but also we break down those that exist within the universities themselves between their campuses or centres, globally facilitating both internal and international communication, which has given rise to the *streamed* international courses discussed in section A.1.

The first programme to develop communication spaces based on videoconferencing training tools gave rise to the E-teaching Room of the Central Research Support Services (SCAI) (University of Malaga). This is a programme that has led to the development of specialised



teaching associated with the International Doctorate School of Marine Studies, **EIDEMAR**, and that has been transversally supported through other programmes, like for example that of the **INNOVAMAR** Teaching Innovation Project call (see section A.3) in which interuniversity communications were strengthened along with the development, creation and sharing of audio-visual teaching products. With philosophy and objectives in common, seven new projects were set up to adapt spaces to e-teaching. As a result, there has been a boost in achieving the objectives of the International Doctorate School of Marine Studies, **EIDEMAR** (see section A.5), in its different fields of study.

These spaces were created to establish a setting of intuitive and easy-to-use operation so the teaching staff can access the media without any need for prior training or technical support. This has meant that the work carried out by these programmes has generated resources that are frequently used in teaching, thanks to them being accepted and adapted by teaching staff. With these characteristics, the following spaces were created in the University of Cadiz: Seminar room of the Andalusian Centre for Marine Science and **Technologies**, **CACYTMAR**, from where, in addition to the **EIDEMAR** courses, courses for companies and public administration on marine-maritime topics are also managed, and coordination meetings with other universities and PRIs belonging to the partnership; the Graduate Hall of the Andalusian Centre for Marine Studies, **CASEM**, meeting the demands of the personnel associated with the Faculty of Marine and Environmental Sciences, the University College of Marine, Nautical and Radio-Electronic Engineering and the School of Naval Architecture and Marine Engineering; not only in training events such as those included in the previous section but also in the presentation of doctoral theses which personnel from all of the different **CEI-MAR** centres participate in; the Europe Classroom of the Andalusian Centre for Marine Studies, **CASEM**, to manage online meetings and the e-teaching for **CEI-MAR** Mas-

ters' qualifications; Graduate Hall of the Faculty of Education Sciences where **CEI-MAR** encompasses other fields of study directly involved in this centre via the Degree in Physical Activity and Sports Science, which is a **CEI-MAR** course with a high degree of specialisation in nautical and water sports; The Faculty of Philosophy and Arts Graduate Hall which is used to provide teaching and research to courses and presentations of doctoral theses to groups associated with the **CEI-MAR** specialisation area: *The Cultural Value of the Sea* and the doctoral programme *Maritime History and Archaeology*; the Faculty of Law Graduate Hall where the highest percentage of activities related with **CEI-MAR** Social and Legal Sciences are concentrated; the Polytechnic Graduate School of Algeciras, home to the Degree in Civil Engineering (coastal and off-shore construction) and several master's degrees with a percentage of specialist teaching on marine-maritime theme: the Master's Degree in Civil Engineering (Roads, Canals and Ports) and the Master's Degree in Renewable Energies and Energy Efficiency) both of which have a close relationship with the chemical industries located in the "Campo de Gibraltar" and with the activities of the Port of Algeciras.

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ROLE OF MEMBERS OF THE PARTNERSHIP

Programmes for the physical and technological adaptation of spaces with a view to improving and widening the teaching activities of the Campus of International Excellence have been designed based on a study of the state and possibilities of the existing ones, and therefore have been derived from the joint work of all the members which has likewise involved the justification of needs and the creation of consistent technical projects, before being evaluated and authorised.

The Marine Research Laboratory, **LABIMAR**, on the other hand, is the first infrastructure belonging purely to the Campus of International Exce-



llence of the Sea. It has been set up with the coordination of the Campus, in coordination with all of the members involved. **LABIMAR** has admitted practical sessions not only from UCA students, but also from the University of the Algarve or the University of Granada.



MOST SIGNIFICANT RESULTS

The most significant results of the programmes described in this section have been the creation of initiatives that are transforming the campus from the traditional concept of teaching to one of a wider range, thanks to the international connection opportunities available with *streaming* technology or e-teaching. This has enabled the development and running of teaching activities and academic work between members, allowing sessions to be run on all subjects, of any academic level (from degree courses to training courses for the doctorate courses, including Masters' degrees and specialization courses) of those offered by **CEI·MAR**. Evidence of the frequency and success in the use of these resources can be



MOST IMPORTANT DEVIATIONS BETWEEN INITIAL OBJECTIVES AND RESULTS OBTAINED

There have been no deviations from the initial objectives. Responsible investment has been made, in view of the total funding **CEI·MAR** had available for these activities, with the objectives having been fitted to that availability. The programmes run have made use of the appropriate exploratory studies to set up training and communication tools that are sustainable over time and easily and intuitively used and have at all times kept to the objective of facilitating teaching through *streaming* technology and e-teaching.

seen when analysing the range of teaching activities listed in section A.1, and which have been run thanks to these technological adaptations.



INTERNATIONALIZATION ACTIVITIES

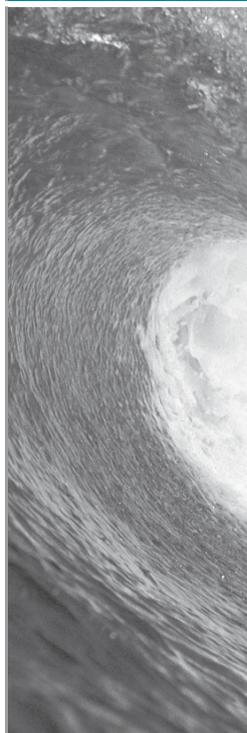
Investment in communication technologies to facilitate videoconference and e-teaching has enabled contact between universities and international bodies in all of the afore-mentioned areas, demonstrated by the holding of numerous virtual meetings, *International Summer School* courses, Erasmus Mundus courses, degree and Masters' courses, thesis defences, *etc.*, not only between the universities and PRIs belonging to the campus of excellence, but also with other universities among which must be noted those that have achieved the **CEI·MAR** Stamp of Excellence: University of Ferrara and the National Autonomic University of Mexico.

New technologies have become a customary resource for direct and immediate contact within the heart of **CEI·MAR** and, above all, with the campus's other international collaborators.



SECTION A.5. EIDEMAR International Doctoral School in Marine Studies

Strategic area	Improving teaching and adapting to the European Higher Education Area
Programme	EIDEMAR International Doctoral School in Marine Studies
Objectives	<p>General objective: To create, launch and consolidate an International Doctoral School in Marine Studies (EIDEMAR) as an international benchmark in southern Europe for marine- and maritime-themed university education in CEI-MAR's areas of specialisation.</p> <ul style="list-style-type: none"> ▶ To design and launch the EIDEMAR International Doctoral School in Marine Studies, ensuring compliance with legal requirements and endowing it with procedures to regulate effective governance. ▶ To commence EIDEMAR activities, including the launch of a promotional campaign among members of the university community and society at large aimed at disseminating the values of doctoral schools and the activities they carry out, stressing the unique nature of EIDEMAR. ▶ To design, approve and deliver the first officially recognised degree courses, paying particular attention to their inter-institutional and international profile. ▶ Affiliation of other appropriate courses to EIDEMAR: master's degrees, internal courses offered by member universities and other continuing education initiatives. ▶ To consolidate the EIDEMAR International Doctoral School in Marine Studies as a benchmark in doctoral studies, engaged in educational, teaching, research, training and dissemination activities of excellence. ▶ To increase the number of courses initially offered by the Doctoral School, placing particular emphasis on Erasmus Mundus doctoral programmes, improving internationalisation indicators and enhancing the participation of CEI-MAR partnership members.



A.5. EIDEMAR INTERNATIONAL DOCTORAL SCHOOL IN MARINE STUDIES

INITIAL OBJECTIVES OF THE 2011 PROPOSAL

The general objective proposed in the initial report was: *"To become an international leader in the field of marine studies in all CEI-MAR areas of specialisation, through the creation of a Doctoral School that is a benchmark for quality"*. To achieve this objective, two actions were proposed:

- ▶ The creation and launch of the **EIDEMAR** International Doctoral School in Marine Studies.

- ▶ The expansion of Erasmus Mundus Doctoral Programmes.

SUMMARY OF WORK ACCOMPLISHED

DESIGN AND LAUNCH OF THE DOCTORAL SCHOOL (2010 - first semester of 2013)

Since 2010, the 14 **CEI-MAR** member institutions have promoted the creation of an inter-



national doctoral school that would host and coordinate the educational and research specialisations that define the Campus of Excellence. This School was conceived from the outset as a permanent institution aimed at centralising high-level marine- and maritime-themed university education in southern Europe. Although doctoral studies formed the primary focus, we were also aware that a school of this nature with a strong international focus had the capacity (and represented the opportunity) to offer a wide range of specialist courses: from master's degrees through specialisation and continuing education courses to doctoral training activities, taught in several languages.

Given these premises and commitments, the **EIDEMAR International Doctoral School in Marine Studies** was conceived as an objective from the outset. The proposed doctoral school was innovative and pioneering in the context of its creation, since the Spanish Ministry of Education, Culture and Sport had recently selected this model, present in other countries but non-existent in Spain, to regulate doctoral programmes in the coming decades. This decision implied a radical change in the doctoral education system, which until then had been much more independent and fragmented. This was officially stipulated in Royal Decree 99/2011, of 28 January, *regulating officially recognised doctoral studies* (Official State Gazette No. 35, 10 February 2011), which establishes the fundamental regulations governing doctoral education in Spain.

At first (2010), numerous coordination meetings were held between representatives of the universities and institutions that had launched the **CEI-MAR** project (link to news 28.05.2010, <http://goo.gl/WngvA>), in which the creation and design of a Doctoral School was considered a strategic element. Through the Campus of International Excellence grants offered in 2009 and the "Enhancement" sub-programme grants offered in 2010 and 2011, the Spanish Ministry of Education promoted the creation of doctoral schools that adhered to this model as part

of its strategy. In May 2010, the **CEI-MAR** project received a grant under the section *Actions classified as "high-quality" by the Technical Committee*, for the "**Creation of the International Postgraduate and Doctoral School**" (page 20 and 21 of the Resolution, ref. CEI10/00054; <http://goo.gl/jT6nED>), giving a deadline for implementation of 31 December 2012.

In November 2010, coordination was resumed in order to present a new application report for the 2011 grants. This involved redesigning the **CEI-MAR** project and reorienting the Doctoral School proposal (link to news 25.02.2011, <http://goo.gl/UFe0x>; link to news 08.04.2011, <http://goo.gl/UaRjCc>; link to news 14.04.2011, <http://goo.gl/CfoQeC>). In April, partial project actions were presented in the 2011 "Enhancement" grant programme, one of which was the creation of the "Doctoral School in Marine Studies", and new grants were awarded for its implementation (ref. CEF11-0013). In June, the **CEI-MAR** project was presented again to the 2011 Campus of Excellence sub-programme, and the first phase was approved (link to news 29.07.2011, <http://goo.gl/Flruvv>). In October of the same year, the project was awarded the status "Campus of Excellence, regional level (CEIR)" (link to news 21.10.2011, <http://goo.gl/mU99u9>): from then on, the creation of an international doctoral school became a priority.

The administrative procedures necessary for launching the *International Doctoral School in Marine Studies* commenced in May 2012, focusing on the regulatory and physical structure. With regard to its legal and administrative structure, **CEI-MAR** partners signed a framework agreement in May of that year whereby it was unanimously agreed to create the **EIDEMAR International Doctoral School in Marine Studies** (link to news 16.05.2012, <http://goo.gl/yA-VKK5>). The next step, which required approximately six months of meetings between all partnership members (link to news 13.09.2012, <http://goo.gl/WKpbUx>; link to news 30.11.2012, <http://goo.gl/aL5nH1>), consisted of drawing up



Visit of a CEI-MAR delegation to the Moroccan Abdelmalek Essaadi University in which this University signed the membership to EIDEMAR

a report on the creation of the **CEI-MAR** Doctoral School in Marine Studies (**EIDEMAR**) and establishing the internal regulations (regulation UCA/CG10/2012, of 21 November, on the internal regulation of the **CEI-MAR** International Doctoral School in Marine Studies, published in *the Official Gazette of the UCA* No. 152, of 21 December 2012; <https://goo.gl/GIV126>). These two texts were agreed and revised by all Campus partner institutions and approved by their respective governing bodies in accordance with the nature of each institution. The framework agreement to create the Doctoral School was ratified by the Social Council of the Coordinating University of the Campus of Excellence in November, after which it was initially signed by the universities of Cadiz, Huelva and Almeria, as well as the University of the Algarve, the Spanish Institute of Oceanography and the Andalusian Institute for Research and Training in Agriculture and Fisheries (link to news 12.12.2012 <http://goo.gl/jdw21F>). Since then, it has also been signed by the other universities and institutions that have joined the project.

The last institution to join **EIDEMAR** (note that in Spain, only universities can deliver doctoral programmes; thus, non-university **EIDEMAR** institutions participate in doctoral programmes through such schools, and are involved in their management in conditions of equality with the universities) has been the Abdelmalek Essaadi University, in Morocco (

CEI-MAR members sign the incorporation deed of EIDEMAR

C7P; the **EIDEMAR** adherence agreement can be found in the annex to this report).

Consequently, **EIDEMAR** is a truly international doctoral school, thanks to the nationality of its researchers in training and its teaching staff, the international nature of its educational programmes and courses, its strategy of collaboration with overseas institutions, and its original members, hailing from Spain, Portugal and Morocco.

In relation to facilities, several meetings were held at this time to implement funded actions. Facilities at the UCA were adapted to host **EIDEMAR** courses, including advanced aquaculture classrooms (area: "The sea as a source of resources") and learning spaces in the Faculty of Philosophy and Arts for disciplines in the Humanities (area: "The cultural value of the sea") (link to news 28.11.2011, <http://goo.gl/EkhFQo>; link to news 23.02.2012, <http://goo.gl/KTmDr6>; link to news 10.03.2012; link to news 21.03.2012, <http://goo.gl/bQKrXJ>).

Definitive and official approval of **EIDEMAR** was granted by the Andalusian University Council at its meeting of 25 June 2013. This approval implied the *de facto* creation of the School, since the corresponding documents had already been sent to the Spanish Government for adoption by the Council of Ministers of the agreement stipulating the publication and registration of the International Doctoral School in Marine Stu-



dies in the Register of Universities, Centres and Qualifications (RUCT). Official registration took place on 16 July 2013 (date of publication 18 July 2013, in the *Official Gazette of the Regional Government of Andalusia*), assigning the centre code 11011342 (<http://goo.gl/FtJLDV>).

Since 2013, the headquarters of the **EIDEMAR** International Doctoral School have been located in the Plaza del Falla, 8, Edificio Hospital Real, 11002 Cádiz. To visit the web page, click on the following link: <https://goo.gl/OWhkZj>.

DEVELOPMENT AND CONSOLIDATION OF THE **EIDEMAR** DOCTORAL SCHOOL (second semester of 2013-2016)

Several parallel procedures were implemented to develop the School, enabling a legal definition of the centre and compliance with the legal requirements for its constitution. In terms of governance, the School's first Director, Dr. Fidel Echevarría, a university Professor of Ecology, was appointed on 5 March 2013 to facilitate the establishment of internal regulations (<https://goo.gl/GIVl26>) and has remained in post since then. On the 29 January 2014, the highest organ of governance of the Doctoral School, the Governing Council, held its first meeting. Shortly afterwards, on 20 March 2014, the first Academic Secretary of the School was appointed, Dr. Darío Bernal Casasola, a Senior Lecturer in Archaeology. The governing body responsible for managing the daily operation of the Doctoral School, the Steering Committee, has held regular meetings since it was first constituted on the 14 October 2013, with a total of 13 meetings to date (the last one was held on 6 June 2016), for which the obligatory minutes of each are available (for 13 minutes download link*). These meetings have regularly been attended by the Director, Secretary and the coordinators (presidents of the academic committees) of officially recognised and internal courses delivered by the School (officially certified doctoral programmes, officially recognised master's de-

grees, continuing education courses and internal courses).

When **EIDEMAR** was created, it was considered important from an academic perspective to appoint a working committee to design four new doctoral programmes to be offered by the School which complied with the requirements of Royal Decree 99/2011, of 28 January, *regulating officially recognised doctoral studies*. Based on the Campus's strategic areas of research and excellence, these programmes were to be designed *ad hoc* to leverage **CEI-MAR** specialisations for delivery by **EIDEMAR**, with the added value of marine specialisation and excellence. Four programmes were designed for which the curricula of the researchers who would be responsible for their delivery far exceeded the minimum research indicators established for the validation of programmes by the assessment agencies, and if the criteria from previous grant programmes for awarding a mention of excellence to doctoral programmes had been applied, all four would have far surpassed the established scales and would have obtained this designation. This careful design of the doctoral programmes resulted in approval and validation of the four proposals in the first instance.

Furthermore, these initial doctoral programmes were designed to promote the research potential of the universities and institutions participating in **CEI-MAR**.

Thus, the four **EIDEMAR** doctoral programmes were registered with the RUCT, and encompassed the following areas of research:

- ▶ **MST**: Marine Sciences and Technology
- ▶ **MMC**: Marine Management and Conservation
- ▶ **MHA**: Maritime History and Archaeology
- ▶ **MR**: Marine Resources

Subsequently, the doctoral programme "Joint Erasmus Mundus Doctorate in Marine and Coastal Management (MACOMA)" was added,



Constituent session of EIDEMAR board of directors



Signing of the agreement between CEI-MAR and the University of Ferrara for teaching a joint doctorate programme on Earth and Sea Sciences (EMaS)

enabling **EIDEMAR** to offer 5 highly specialised marine- and maritime-themed doctoral programmes, all with a marked international nature and scope.

A summary of each is presented below:

★ **MARINE SCIENCE AND TECHNOLOGY / Doctoral Programme in Earth & Marine Sciences (EMS) at the University of Ferrara**

This initially began as a Programme in Marine Science and Technology at the Campus of Excellence. However, in 2015 (<https://goo.gl/Xd9GBY>; <https://goo.gl/VNxvER>) it was transformed into a double doctoral degree in collaboration with the prestigious Italian University of Ferrara, exponentially enhancing its international profile.

- ▶ Brief description of the programme:
- ▶ Qualification: Doctorate
- ▶ Field of study: Science
- ▶ Name: Doctoral Programme in Marine Science and Technology at the University of Cadiz (<https://goo.gl/zSJn4o>) / Doctoral Programme in Earth & Marine Sciences (EMS) at the University of Ferrara
- ▶ RUCT Code (Spanish register of universities, schools and degrees): 5600780
- ▶ Credits and duration: 3 years (part-time: 5 years)

- ▶ Centre: International Doctoral School in Marine Studies (**EIDEMAR**)
- ▶ Number of places available: 15
- ▶ Language(s) in which the subject is taught: Spanish, English and Portuguese
- ▶ Academic year when launched: 2013-14
- ▶ ISCED1: Environmental sciences
- ▶ ISCED2: Physics, chemistry and geology

Areas of research on the programme:

1. Biogeochemical processes in coastal and continental systems

This area includes the initial diagenesis of organic matter in coastal systems, the effects induced by diagenetic processes (regeneration of nutrients), and associated flows of gases, as well as the dynamics of nutrients and the extent of the role played by diagenetic processes in climate change. It also includes the use of equipment and methodologies to study coastal zones.

2. Physics and geodynamics of oceans and the Earth

This area includes hydrodynamic processes in bays and estuaries, coastal dynamics, regional and applied geomorphology, regional and applied marine geology, active geological processes, the interaction of flows in straits, nu-



merical modelling of atmosphere-ocean and ocean-lithosphere interaction phenomena, and fluid emissions, as well as aspects of operational oceanography, coastal, beach and dune engineering, and remote sensing applied to marine and terrestrial environments.

3. Geophysics and geodesy

This area includes the design and use of geographic information systems (GIS) in automated environments, geodetic and geophysical research in marine, polar (Antarctic) and volcanic environments, mathematical modelling of volcanic system processes and their associated natural hazards, determination of accurate geoid models and geodetic applications at sea level, as well as use of specific remote sensing and geophysics instrumentation.

4. Sedimentation in marine environments

This area includes the study of sedimentation and sedimentary evolution in relation to climate change in areas of the Gulf of Cadiz, the paleoceanography of siliceous deposits, biomineralisation in invertebrates and the implications of chemical weathering in sedimentary environments.

5. Structure and dynamics of aquatic ecosystems

This area includes aspects such as the ecophysiology of marine macroalgae and seagrasses, influence of environmental variables on primary production, structure, dynamics and biodiversity

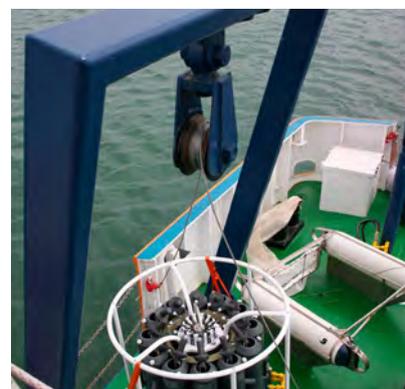
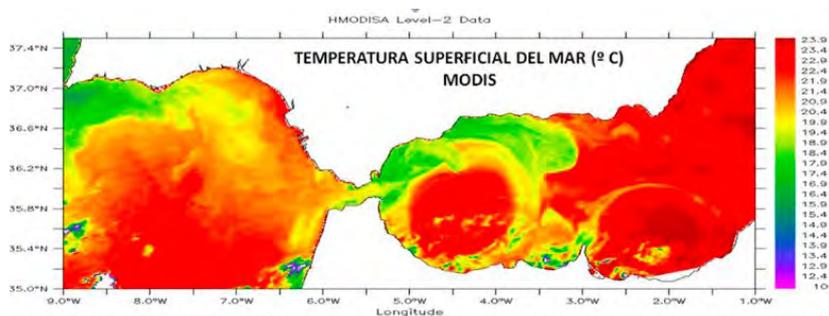
of benthic systems dominated by macrophytes, their cultivation and importance as bio-indicators of environmental quality, benthic microbial ecology, marine microbial mats, use of biofilms for water treatment, biogeochemical cycles of carbon and nitrogen in marine sediments, sequestration and mobilisation of metals in sediments, biological oceanography and limnology, trophic webs, phytoplankton and zooplankton, pelagic systems, larval recruitment, biogeochemical cycles, and regional oceanography on the coasts of the Gulf of Cadiz, Alboran Sea and Strait of Gibraltar.

6. Molecular and cell biology, genetics and genomics of marine organisms

This area includes cloning and characterisation of genes from marine organisms, biochemical, molecular and cellular aspects of organisms in the marine environment, cDNAs and protein functionality assays, cell culture, marine organism population genetics, localisation and mapping of genes in fish and molluscs, marine organism genomics, identification and traceability of species, and determination of genotoxicity.

7. Microalgae biotechnology

This area includes the development, operation and automation of photobioreactors for microalgae cultivation, as well as microalgae ecophysiology and techniques to identify, isolate and maintain strains.



Within the "Sea Sciences and Technology" Doctorate Programme, the oceans dynamic is studied using synoptic satellite images (left) or collecting samples on-board oceanographic vessels (right)



8. Energy and environmental efficiency and technological improvements in marine facilities

This area includes energy optimisation in marine engineering, marine air pollution engineering, disinfection of sea water and optimisation of antifouling treatments, acoustic and marine maintenance engineering, analysis of processes aimed at waste recovery, energy recovery and agricultural reuse of marine aquaculture waste and effluents, advanced oxidation processes applied to the treatment of industrial wastes discharged into the sea, solar disinfection of natural and waste waters, the behaviour of materials in the marine environment, and development of protection methods.

★ MARINE MANAGEMENT AND CONSERVATION

Brief description of the programme:

- ▶ Qualification: Doctorate
- ▶ Field of study: Science
- ▶ Name: Doctoral Programme in Marine Management and Conservation at the University of Cadiz (<https://goo.gl/zSJn4o>)
- ▶ RUCT Code (Spanish register of universities, schools and degrees): 5600803
- ▶ Credits and duration: 3 years (part-time: 5 years)
- ▶ Centre: International Doctoral School in Marine Studies (EIDEMAR)
- ▶ Number of places available: 15
- ▶ Language(s) in which the subject is taught: Spanish, English, French and Portuguese
- ▶ ISCED1: Environmental sciences
- ▶ ISCED2: Environmental protection

Areas of research on the programme:

1. Biodiversity, conservation and management of species and habitats

This area focuses primarily on the study of biodiversity, as well as assessment and planning for different coastal systems and the species they contain.

2. Anthropogenic impacts, environmental protection and global change

This area of research focuses on the study of different contaminant analysis techniques for assessing the environmental impact of all kinds of contaminants on the marine environment, and the development of techniques conducive to its conservation.

★ MARITIME HISTORY AND ARCHAEOLOGY

Brief description of the programme:

- ▶ Qualification: Doctorate
- ▶ Field of study: Arts and Humanities
- ▶ Name: Doctoral Programme in Maritime History and Archaeology at the University of Cadiz (<https://goo.gl/zSJn4o>)
- ▶ RUCT Code (Spanish register of universities, schools and degrees): 5600782
- ▶ Credits and duration: 3 years (part-time: 5 years)
- ▶ Centre: International Doctoral School in Marine Studies (EIDEMAR)
- ▶ Number of places available: 10
- ▶ Language(s) in which the subject is taught: Spanish, English, French, Portuguese and Italian
- ▶ ISCED1: History and Archaeology
- ▶ ISCED2: History and Archaeology

Areas of research on the programme:

1. Maritime Archaeology

At present, this research area includes studies and research aimed at the historical recons-



One of EIDEMAR singularities is its "Maritime History and Archaeology" Doctorate Programme

truction of human societies, economies and visions of the world from prehistory through to the Industrial Revolution, preferably in the Atlantic - Mediterranean area, albeit with necessary incursions into other geographic regions. The preferential field of analysis is humanity's relationship with the sea and aquatic environments, and human coastal - inland interactions.

2. Archaeological Science

This line of research encompasses all aspects of archaeometry, understood as the application of science to historical and archaeological questions, drawing on diverse analytical techniques and methods from outside the Humanities. Employing an interdisciplinary approach, research includes exploring the physicochemical properties of archaeological materials, their behaviour in terrestrial and marine environments and historical heritage conservation studies.

3. Maritime History

This area includes historical and archaeological studies focused on the historical reconstruction of human societies, economies and visions of the maritime world from prehistory to modern times. Of particular interest is the analysis of human expansion across the American continent in that period, and trade relations with Europe by sea.

4. Historic and Cultural Landscapes

This area encompasses diverse humanistic research approaches to multiple manifestations

in the historical and cultural landscape. In particular, it refers to the study of the landscape in relation to the development over time of prehistoric and historic cultures in coastal and inland, rural and urban areas, looking at humanity's social and natural relationship with the landscape and the effect of human activities on the same.

★ MARINE AND COASTAL MANAGEMENT (MACOMA)

- ▶ Brief description of the programme:
- ▶ Qualification: Doctorate
- ▶ Field of study: Science
- ▶ Name: Erasmus Mundus Doctoral Programme in Marine and Coastal Management (MACOMA) (<https://goo.gl/U1I2fq>)
- ▶ RUCT Code (Spanish register of universities, schools and degrees): 5600008
- ▶ Coordinating University of the consortium: University of Cadiz
- ▶ Other participating universities: Russian State Hydrometeorological University; University of Aveiro; University of the Algarve; University of Bologna;
- ▶ Credits and duration: 3 years (part-time: 5 years)
- ▶ Centre: International Doctoral School in Marine Studies (EIDEMAR)
- ▶ Place delivered: Puerto Real Campus



The "Marine Resources" Doctorate Programme includes two research areas on fisheries (left) and aquaculture (right)

- ▶ Number of places available: 20
- ▶ Language(s) in which the subject is taught: English
- ▶ Academic year when launched: 2011-2012

Areas of research on the programme:

1. *Carbon capture and storage (CCS) in marine and coastal environments.*
2. *Bioaccumulation and bioavailability of contaminants in marine and coastal environments.*
3. *Environmental quality assessment based on weight-of-evidence approaches.*
4. *Renewable Marine Energy (the marine and coastal environment for food and rural development).*
5. *Dredged material characterisation and management.*
6. *Operational oceanography in marine and coastal management.*
7. *Sensitive tools for marine and coastal environmental quality assessment.*
8. *Assessing the effect of nutrient sources and water quality on the natural stable isotope ratios of marine macrophytes.*
9. *Influence of Ph & salinity on contaminant behaviour and adverse biological effects in marine and coastal environments, inclu-*

ding estuaries.

10. Mitigation and emergency plans related to accidental spills in the marine and coastal environment.

11. Histological, histochemical and biochemical technologies in marine and coastal aquaculture.

12. Waste water management and characterisation and management of industrial residues in marine and coastal environments.

★ MARINE RESOURCES

Brief description of the programme:

- ▶ Field of study: Science
- ▶ Name: Doctoral Programme in Marine Resources at the University of Cadiz (<https://goo.gl/zSJn4o>)
- ▶ UCA code: 8211
- ▶ RUCT Code (Spanish register of universities, schools and degrees): 5600804
- ▶ Credits and duration: 3 years (part-time: 5 years)
- ▶ Centre: International Doctoral School in Marine Studies (**EIDEMAR**)
- ▶ Number of places available: 15
- ▶ Language(s) in which the subject is taught: Spanish



- ▶ Academic year when launched: 2013-2014
- ▶ ISCED1: Agriculture, livestock and fisheries
- ▶ ISCED2: Environmental sciences

Areas of research on the programme:

1. Aquaculture

The aquaculture group's main areas of research focus on optimisation of aquaculture, development of integrated marine cultivation techniques, traceability of cultivation processes and improvement of product quality, domestication and breeding of aquaculture species, and environmental impact of aquaculture activities.

The training received will equip future doctors to carry out highly specialised aquaculture research, and to apply the knowledge acquired in the business sector, contributing to optimising sustainable production of high quality marine-based foods.

2. Living marine resources

The living marine resources research team focuses on multi-specific fisheries assessment, the effect of climate and oceanography on living marine resources, ecological modelling of the marine ecosystem, and the study of geohabitats and hydrodynamic and sedimentary processes in the marine environment.

Graduates from this programme will be equipped to embark on a brilliant research career studying the sustainable use of wild marine resources. Furthermore, their specialised training will qualify them as experts in the management and conservation of living marine resources.

Minor changes have been made to each of these doctoral programmes over their three years of delivery, to optimise day-to-day operation. These have mainly included variations in the academic committees and proposals for change in coordination of the courses, etc., all of which is recorded in the minutes of meetings of this body, which are available for public consul-

tation, with access authorised in the postgraduate platform of the University of Cadiz (postgrado.uca.es/doctor).



In relation to strengthening the courses delivered by **EIDEMAR**, the International Doctoral School has promoted the creation of a **Master's Degree in Nautical and Underwater Archaeology**, which will be launched in the academic year 2016-2017.

This is a strategic master's degree for the **CEI-MAR** Campus, since the partnership includes two institutions that specialise in this subject (the Underwater Archaeology Centre of the Andalusian Historical Heritage Institute of the Regional Government of Andalusia and the National Museum of Underwater Archaeology of Cartagena, of the Ministry of Culture). This is the first officially recognised master's degree of this nature to be taught at a Spanish University due to the practical training it provides for underwater archaeologists, currently not available in Spain. A summary of the fundamental aspects of this course is given below.

- ▶ Field of study: Arts and Humanities
- ▶ Name: Master's Degree in Nautical and Underwater Archaeology at the University of Cadiz (<https://goo.gl/Pmfg2S>)
- ▶ Mode of delivery: face-to-face
- ▶ Credits and duration: 60 credits
- ▶ Centre: International Doctoral School in Marine Studies (**EIDEMAR**)
- ▶ Number of places available: 30
- ▶ Language(s) in which the subject is taught: Spanish
- ▶ Academic year when launched: 2016-2017
- ▶ Coordinator: Dr. D. Xavier Nieto Prieto

Academic summary: Due to the multidisciplinary nature of this master's degree, several University of Cadiz departments are involved, including



The "Sea Management and Preservation" Doctorate Programme at EIDEMAR tackles marine pollution (micro-plastics, left) or the integrated management of littoral areas (right)

the Faculty of Philosophy and Arts (history, geography and philosophy; modern, contemporary, American and art history; classical languages), the Faculty of Marine and Environmental Sciences (materials science; metallurgical and inorganic chemical engineering; earth sciences), the Faculty of Sciences (mathematics; physical chemistry), Faculty of Law (international public criminal and procedural law; public law), the School of Marine, Nautical and Electronic Engineering (navigation science and techniques and signal and communication theory; thermal machines and engines) and the School of Naval and Oceanic Engineering (shipbuilding; computer engineering).

The teaching staff who deliver this master's degree are well qualified to do so, as evidenced by their long and successful teaching and research careers in the subject area of the master's degree (most of them have more than twenty years of teaching experience). The master's degree teaching staff include specialists whose research has encompassed maritime history, coastal archaeology, nautical and underwater archaeology, coastal geomorphology, geoarchaeology and marine geophysics, as evidenced by their scientific production, the doctoral theses they have supervised, and the research projects they have directed or in which they have participated. These renowned staff come from prestigious European universities. The participation of these overseas teaching staff, many of whom direct similar educational pro-

grammes elsewhere in Europe, will endow students with possibilities for future exchange and mobility, and useful contacts for their research and professional careers.

The governing bodies of **EIDEMAR** are currently working on new courses for delivery by the School, including a "Doctoral Programme in Biogeochemical Flows and their Applications" at the University of Cordoba, the University of Granada and the University of Malaga (<https://goo.gl/saQ7iZ>), since the Governing Council of the University of Malaga approved affiliation to **EIDEMAR**.

In addition to this master's degree directly linked to **EIDEMAR**, **CEI-MAR** offers other master's degrees with content directly or indirectly related to the marine and maritime fields that characterise the Campus (Section A.1.).

DOCTORAL TRAINING ACTIVITIES

Doctoral students must attend 600 hours of *training activities* in the Doctoral School while preparing their doctoral thesis (3 years full-time or 5 years part-time). These hours are distributed among a wide range of optional or obligatory activities, and vary significantly according to each doctoral programme due to the specificity of these. Full details are given in the report for each **EIDEMAR** programme, which can be accessed on the web page (<https://goo.gl/10rqNy>).



It is for this reason that the **EIDEMAR** Steering Committee decided from the first academic year to propose a range of high-level doctoral specialisation courses focusing on the subjects of the doctoral theses in preparation. These courses have been proposed by the various academic committees of the doctoral programmes, in line with the students' interests. Due to their excellent reception, these courses have subsequently been offered to other members of the university community and to interested professionals.

Below we provide a summary of the courses offered over the past three academic years. These comprise a total of 20 specialist doctoral training activities in all **CEI-MAR** areas of specialisation. Teaching is delivered in several languages (Spanish, French, English and Portuguese) and includes the participation of professionals from more than twenty first-rate universities and institutions around the world. Click on the link to see the courses on the **EIDEMAR** web page (<https://goo.gl/s2CkTC>).

★ **Doctoral Programme in Maritime History and Archaeology**

- ▶ The impact of climate on historic landscapes.
- ▶ Archaeometry of organic materials of exotic origin in antiquity.
- ▶ Atlantic port cities as catalysts of exchange and the construction of identity.
- ▶ Issues in maritime archaeology.
- ▶ Archaeometry in maritime archaeology.
- ▶ The Atlantic city: identity and government.
- ▶ Ports in Antiquity.
- ▶ Methods and sources for analysing land and the historical and cultural landscape: diachronic case studies.
- ▶ Introduction to GIS technologies applied to documentation, management and research in maritime history and nautical and underwater archaeology.

★ **Doctoral Programme in Marine Resources**

- ▶ Basic analytical techniques applied to aquaculture.
- ▶ Basic techniques applied to aquaculture.
- ▶ Study of biological parameters for fishery resource assessment
- ▶ Biological processes of interest in aquaculture: basic and applied aspects.

Doctoral Programme in Marine Management and Conservation

- ▶ Real-life experiences of coastal and marine management: lessons learnt and international trends.
- ▶ Integrated coastal and marine management: international and local experiences.
- ▶ Protection of coastal and marine areas.

Doctoral Programme in Marine Science and Technology

- ▶ Use of stable isotopes in aquatic ecology.
- ▶ Scientific Python: application to oceanography.
- ▶ Theory and practice of beach regeneration. The answer to coastal erosion?
- ▶ Biotechnology applied to marine organisms.

SCHOLARSHIPS AND GRANTS FOR EIDEMAR DOCTORAL STUDENTS

Over the three years of the Doctoral School's existence, various scholarships and grants have been made available to doctoral students enrolled in **EIDEMAR** programmes.

These have included 9 predoctoral contracts with **EIDEMAR** and **CEI-MAR**, offered as part of the General Plan for Promoting Research and Knowledge Transfer. These were awarded to 4 Campus institutions; the universities of Cadiz, Huelva, Malaga and Granada (<https://goo.gl/AoyCJG>).



Funds have also been allocated to facilitate international mobility among the School's doctoral students. These have been channelled through specific grants aimed at funding international placements, or attendance/participation in conferences, courses or other types of training activities included in the respective doctoral programmes (<https://goo.gl/Q6aJDm>).

In addition, funds have recently been obtained under the programme "Grants for the Consolidation of Projects of Excellence in Universities", convened by the Spanish Ministry of Education, Culture and Sport ("Grants CEI2015"). Action I: Joint master's degree and doctoral programmes offered by universities and institutions belonging to a same CIE, between CIEs or in collaboration with overseas universities; Training activities on **EIDEMAR** doctoral programmes; and grants for international mobility promoted by the **CEI-MAR** Foundation, such as the *Erasmus + KA107* (<https://goo.gl/McAmqb>) or the *International mobility grants for undergraduate and doctoral students for the academic year 2016-2017, within the framework of the European programme Erasmus+* (<https://goo.gl/FAyY5Q>), guarantee the continuity of the same during 2016 and at least 2017.

In addition, specific grants have awarded to promote the mobility of doctoral students and enable them to attend relevant training activities that they have requested, applying a *bottom-up* strategy, or that have been proposed by the academic committees of the doctoral programmes, once these proposals have been approved by the **EIDEMAR** Steering Committee (<https://goo.gl/U48mmP> and Section A.6.).



Doctoral student indicators for **EIDEMAR**'s first three years (2013-2016) include the following:

- ▶ Available places filled: 216 doctoral students in 3 years. In all cases, demand has exceeded availability of places on courses offered by the School, resulting in a substantial increase in places to accommodate more doctoral students.

- ▶ Wide range of nationalities, representing 21 countries on 4 continents, with a strong presence of:
 - ◊ Spanish students (75.9% of the total, 164 doctoral students).
 - ◊ Latin American students (11.6%, 25 doctoral students) from 8 countries: Argentina, Brazil, Colombia, Cuba, Ecuador, Mexico, Panama and Venezuela.
 - ◊ European students (9.2%, 20 doctoral students) from 5 countries: Germany, Estonia, France, Italy and Portugal.
 - ◊ Other nationalities (3.2%, 7 doctoral students) from Bangladesh, Canada, Ethiopia, India, Iran, Kenya and Russia.
- ▶ High international presence: 24% are overseas doctoral students (52 out of 216), distributed across the doctoral programmes as follows: 8% MHA; 13% MST 20% MR; 22% MMC; 63% MACOMA.
- ▶ First doctoral theses defended (5% of total doctoral students), an important figure bearing in mind that at the time of writing this report, the International Doctoral School is only in its third year of existence and many doctoral students are part-time.

The following lists a selection of the first 10 doctoral theses defended by **EIDEMAR** graduates up to April 2016, the cut-off point for this report. As can be seen, more than 50% of these theses have been defended in English, which is a clear indicator of the international nature of the Doctoral School.

2015

- ▶ Dimitri Sharapov, "Horizontal ice loads from the level ice on freeze-in into the ice floating structures" - 5 November 2015 - MACOMA
- ▶ Rankiri P.P. K. Jayasingue, "Links between the qualitative descriptors of the Euro-



pean marine strategy framework directive (MSDF)" – 16 December 2015 - MACOMA

- ▶ Sirak Robele Gari, "Frameworks for sustainable management of catchment-coast social-ecological systems" - 16 December 2015 – MACOMA

2016

- ▶ 25 January 2016 - Baena Noguerras, Rosa María, "Determination and environmental behaviour of pharmaceuticals and personal hygiene products in aquatic environments" - MST
- ▶ 28 January 2016 - Bonnail Miguel, Estefania, "Biological Effect Characterisation in Aquatic Systems Affected By Mining Contamination" - MACOMA
- ▶ 28 January 2016 - Demir Barik, "Visitor Monitoring: a tool for tracking the management and effectiveness of coastal protected areas. Case Study: Paklenica National Park" - MACOMA
- ▶ 1 March 2016 - Polanco Rodríguez, Ángel Gabriel, "Assessment of water contamination and human biomarkers for the use of organochlorine pesticides in the State of Yucatan, Mexico" - MACOMA
- ▶ 1 April 2016 - Semeoshenkova, Vera, "Integrated framework for beach management" - MACOMA
- ▶ 7 April 2016 - Mozahedy, Abul Bashar Mohammed Khan, "A methodology to decrease the sinking phenomenon in breakwaters constructed in sandy bottoms" - MACOMA
- ▶ 26 April 2016 - Alvarado Fernández, María, "Neuroendocrine and molecular characterisation of the kisspeptin system (kiss/gpr54) in the European seabass (*Dicentrarchus labrax* L.): interactions with sexual steroids and melatonin during gametogenesis" - MR

EDUCATIONAL ACTIVITIES WITH THE EIDEMAR SEAL

In addition to the annual programme of doctoral training activities, numerous other educational activities aimed at disseminating doctoral information have been carried out over the past three years to facilitate the integration of doctoral students in the School and promote their interaction with other research groups, as described below:

The **EIDEMAR** Inaugural Study Days, entitled "The sea, an inexhaustible laboratory for doctoral education" (2-3 April 2014), constituted the academic point of departure for the first cohort of doctoral students, and contact with 8 top-level Spanish researchers in their respective areas of knowledge (<https://goo.gl/JOw202>; <https://goo.gl/dMjJRe>; <https://goo.gl/FliaS2>).

Study Days "The Malaspina project as a fount of marine science researchers", in which students from the School (11-12 December 2014) interacted with junior and senior researchers on this important project funded by the Spanish Ministry of Economy (<https://goo.gl/FvQvxk>; <https://goo.gl/5vKYaf>).

1st Doctoral Study Day at the University of Cadiz, with the Doctoral School of the University of Cadiz (EDUCA) and **EIDEMAR** (1 December 2015). Doctoral students interacted with teaching staff and researchers from the academic committees and various doctoral programmes, putting forward proposals that were then transmitted to the Steering Committee of the School (<https://goo.gl/2FNptv>). These activities will be repeated annually.

In addition to these activities, programmed directly by the School's governing bodies, other educational or teaching and research activities have also been awarded the International Doctoral School's seal of quality over the past three years, evidencing the quality of its programmes and providing the respective universities with direct recognition for hours of obligatory doctoral training activities. The most recent are three



Since its implementation, EIDEMAR has held special workshops with students of all its doctorate programmes.

courses proposed by the University of Huelva, whose initiative was approved by CEI-MAR's Inter-Institutional Teaching Committee in April 2016:

- ▶ International Colloquium "Trajan, Roman Emperor". Atlantic ports and their relationship with Ostia Antica (Huelva, 10 May).
- ▶ Lecture series on the Spanish language in the world (Huelva, 31 May, 2, 6 and 8 June).
- ▶ The future of the Spanish energy model: hydraulic fracking and renewable energy (Huelva, 17 June).

Notable among the **international activities** are the BECAR grant programme in Argentina and the Marine Sciences Specialisation Course in Quito. In both cases, overseas governments have asked the EIDEMAR International Doctoral School to propose actions that they will fund with a view to training doctors, experts and professionals in their respective countries.

The Argentine Ministry of Modernisation, in collaboration with the Chief of the Cabinet of Ministers and the Sub-Secretariat of Public Employment and Management, has developed the BECAR programme to award grants for overseas study to Argentine professionals working in the areas of science, technology and productive innovation of strategic relevance for the sustainable development of Argentina. The 2016

grant programme includes a specific section entitled Grants for Specialist Short Courses in Marine Science at the University of Cadiz (CEI-MAR / EIDEMAR), to facilitate the participation of Argentine professionals in highly specialised doctoral level courses offered by the EIDEMAR International Doctoral School in Marine Studies. These specialist courses include an intensive programme of up to 4 months duration, for specialised training in issues related to innovation, science and technology identified as priority areas for Argentina (<https://goo.gl/dPvZoY>). Three doctoral training activities have been selected by the Argentine authorities: Biotechnology applied to marine organisms (May-June); Basic techniques applied to aquaculture (September); and Study of the biological parameters for assessing fisheries resources (October-November), which form part of the courses delivered on the Marine Resources and Marine Science and Technology doctoral programmes at the University of Cadiz, via the EIDEMAR International Doctoral School (<https://goo.gl/8eKrJW>).

The BECAR programme is open to all professionals holding Argentine nationality or resident in the country who are university graduates of degrees lasting no less than four years, have specialised in the scientific areas of science, technology and productive innovation identified as priority areas for Argentina, and who undertake to subsequently work in these fields. The areas and degrees identified as priority areas on the BECAR programme are aligned with the



Doctorate students of EIDEMAR during the Kick-off seminars, attending a speech by Dr. Pep Gasol (CSIC, Barcelona)

Government) of the **EIDEMAR** International Doctoral School in Marine Studies (<https://goo.gl/6v75EF>).

- ▶ Incorporation of **CEI·MAR** institutions into **EIDEMAR**, as members of its Governing Council where legally permitted (the universities), and in cases where it is not, by contributing their experience, expertise and resources for doctoral programme training activities, helping define the International Doctoral School's research strategy or participating in doctoral students' research by offering use of their facilities and thesis supervision.
- ▶ Internationalisation of **CEI·MAR's** educational programme delivered via **EIDEMAR**, endowing the courses offered by the Campus of Excellence with the highest level of research training when overseas institutions so require.
- ▶ Design of 4 highly specialised doctoral programmes affiliated to **EIDEMAR** (2013), specifically created as part of **CEI·MAR's** research and internationalisation strategy.
- ▶ Increase in the number of courses offered by **EIDEMAR**, with the addition of a fifth doctoral programme, a specialised master's degree and a suite of educational activities and specialist courses aimed at doctoral training, research specialisation and professional qualifications (lifelong learning).



At the LABIMAR premises, it was held the defence of one of the first doctoral theses by EIDEMAR students

- ▶ **EIDEMAR** delivery of the Erasmus Mundus Doctoral Programme in Marine and Coastal Management (MACOMA) (<https://goo.gl/U1I2fq>).
- ▶ All courses filled and all **EIDEMAR** degree course places allocated, with an increase in the initial number offered due to the high demand.
- ▶ Design and launch of the **EIDEMAR** master's degree in Nautical and Underwater Archaeology at the University of Cadiz (<https://goo.gl/NP2Fwl>).
- ▶ Programming and development of a comprehensive suite of doctoral courses at various levels.
- ▶ First year of graduates in the third year of existence, with more than 10 doctoral theses defended.
- ▶ Achievement of prestige for the "**EIDEMAR** brand" and high demand for its "seal of quality" for the organisation and delivery of training activities, at national and international level.

INTERNATIONALISATION ACTIONS

EIDEMAR degree courses taught in several languages (Spanish, French, English, Italian and Portuguese).



- ▶ High indicators of internationalisation of **EIDEMAR** doctoral programmes, with students enrolled in doctoral programmes accounting for close to 25% of the total.
- ▶ High number of overseas teaching staff and researchers in the training activities and degree courses offered.
- ▶ Internationalisation of degree courses offered by the School (doctoral programme MST - EMS Ferrara; and MACOMA).
- ▶ Specific programme of high-level doctoral courses for other countries (BECAR - Argentina; Marine Science Course - Quito).
- ▶ Design of specific doctoral training activities and projects for Ibero-American universities, under the auspices of the AUIP.



MOST SIGNIFICANT DEVIATIONS FROM INITIAL OBJECTIVES AND RESULTS OBTAINED

The objectives proposed for this programme have been fully achieved. The **EIDEMAR** International Doctoral School is now a reality that has been in operation for three academic years, has a clear international vocation, and offers 5 doctoral programmes covering a very wide range of marine and maritime specialisations.

One of the doctoral programmes (MACOMA) is an Erasmus Mundus programme, and another (MST) is a joint programme with the Italian University of Ferrara.

The strategy for future consolidation of **EIDEMAR** focuses primarily on two aspects:

- ▶ First, continuing to provide specialised **EIDEMAR** courses targeting doctoral research and quality training. **CEI·MAR** institutions have defined their scope and objectives with precision, enabling the Campus of Excellence to continue to consolidate its leading position in national and international research, with the **EIDEMAR** International Doctoral School in Marine Studies as its flagship.
- ▶ The experience of these past three years has allowed us to identify the areas on which to focus **EIDEMAR's** strategy of growth, specialisation and consolidation, based essentially on two fronts:
 - ◊ Increasing the participation of the rest of **CEI·MAR** member institutions in the, doctoral and specialist training offered by the Campus of Excellence. This will entail increasing the commitment of these institutions to the consolidation of **EIDEMAR's** courses, internationalisation strategy and proposed creation and affiliation of new International Doctoral School degrees.
 - ◊ Developing the suite of **EIDEMAR** educational activities designed to ensure the best research training for its doctoral students, to attract talent from other national and overseas universities, to meet the needs and leverage the opportunities of lifelong learning and to consolidate the International School. Such actions must be organised, integrated and coordinated in such a way that undergraduate and master's degrees offer the best opportunities for doctoral studies and that these latter become a benchmark in scientific and professional activity for business in the region and a model of social dissemination of marine science.



SECTION A.6. Promoting international mobility

Strategic area	Improving teaching and adapting to the European Higher Education Area
Programme	Promoting international cooperation and mobility
Objectives	<p><i>To develop and consolidate exchanges, cooperation and mobility so that the partnership's systems of education, training and talent attraction become a benchmark of excellence in areas of specialisation related to the sea, thereby strengthening the creation of a shared knowledge space.</i></p>
	<p>Due to its origin and its strategic location, CEI-MAR boasts a triple scope of action: European, Mediterranean (towards Northern Africa) and Latin American, due to historical and language bonds. In this sense, CEI-MAR is called to be fully integrated in the European Higher Education Area, in relation to its academic and research activity, but also to reach Northern Africa (AbdelMalek Essaadi University in Tangier-Tetouan, which belongs to the partnership) and Latin America. Showing the potential to reach other geographical areas, which represent first world powers concerning the marine-maritime studies, CEI-MAR has focused its efforts in knitting its own contact network and international mobility in these three areas, looking for alliances for projects in developed countries, whilst attracting talent and fostering training of specialised staff.</p> <p>To achieve this goal, five actions were initially set out:</p> <ul style="list-style-type: none"> ▶ Plan supporting (outgoing-incoming) students' international mobility. ▶ Plan supporting (outgoing-incoming) professors and managers' international mobility. ▶ Plan on talent attraction in teaching. ▶ Plan on welcoming and tutorship of international students. ▶ Plan supporting short training stays. <p>When developing the CEI-MAR project, all these five actions have been reformulated and enlarged in the following aspects:</p> <ul style="list-style-type: none"> ▶ To establish and strengthen strategic alliances that enable and facilitate the mobility of students, teachers and administrative staff, not only within the European Higher Education Area (EHEA), but also with key partners who are: <ul style="list-style-type: none"> a) of international scientific renown. b) located in countries or regions with specific Higher Education (HE) support programmes and that are committed with projects involving international participation. c) located in developing countries with specific HE support programmes. d) ready to participate in existing networks or to create other specific brand new. ▶ To participate in mobility calls for proposals, national and international academic and scientific cooperation projects, especially in those countries and regions where the partnership is consolidated. ▶ To foster the recruitment of talent through professors' mobility for teaching, in the areas of master and doctoral studies and a suitable welcoming of international students through a global welcoming and tutorship plan.



INITIAL OBJECTIVES FROM THE 2011 PROPOSAL

On the 2011 proposal, the same general objective stated on the previous paragraph was set out: *To develop and consolidate exchanges, cooperation and mobility so that the partnership's systems of education, training and talent attraction become a benchmark of excellence in areas of specialisation related to the sea, thereby strengthening the creation of a shared knowledge space.*

This objective was made up by 5 actions:

- ▶ Plan supporting (outgoing-incoming) students' international mobility.
- ▶ Plan supporting (outgoing-incoming) professors and managers' international mobility.
- ▶ Plan on talent attraction in teaching.
- ▶ Plan on welcoming and tutorship of international students.
- ▶ Plan supporting short training stays.



DESCRIPTION OF WORK ACCOMPLISHED

In order to present the objectives achieved and the actions accomplished, in a simpler way, two areas will be differentiated: structural actions and specific mobility and/or talent attraction actions/programmes.

1.- STRUCTURAL ACTIONS.

European Higher Education Area.

CEI-MAR's most direct and natural scope of action is the EHEA. For this reason, CEI-MAR has focused a great part of its actions on becoming a recognised player within the EHEA and the Erasmus+ and H2020 European programmes.

As a result of the work done during these five years, CEI-MAR has fully joined the Erasmus+ programme as a differentiated and recognisable player. Since joining the programme, significant achievements have been made in the calls for proposals detailed below, in which it took part: thus, CEI-MAR boasts a benchmark position in Europe in the field of marine-maritime studies, fostering mobility and academic cooperation projects, directly linked to these studies, and developing the "blue growth" or "blue economy".

Once the CEI-MAR Foundation was created as the Campus governance instrument, the Foundation has sequentially promoted and achieved the following actions:

- ▶ **Obtaining the PIC code** for the CEI-MAR Foundation, as an element for representing the whole of the Campus, allowing its participation in European calls for proposals within the Erasmus+ and H2020 projects.
- ▶ **Registration of the CEI-MAR Foundation as an Education Consortium.** The submission and approval of a **KA108 Erasmus+ project** within the KA1 Erasmus+ calls for proposals in 2015 enabled CEI-MAR registration in the Erasmus+ programme. This achievement, together with obtaining the PIC code helped the submission of **KA103, KA107 and KA203** Erasmus+ projects in the 2015 and 2016 calls for proposals with the outcomes explained below.
- ▶ It is important to highlight that regulations restrict the Education Consortium to a single national territory, in this case, to the five Andalusian universities participating in the partnership: Almeria, Cadiz, Granada, Huelva and Malaga. However, obtaining the PIC may potentially foster mobility among the Spanish universities and the Portuguese partner (University of Algarve) and the Moroccan partner (AbdelMalek Essaadi University), through KA103 and KA107 Erasmus+ mobility projects as it is stated below:
- ▶ **Signature of new Erasmus+ specific cooperation bilateral agreements for CEI-MAR.** Each



European partner university of the Campus of Excellence (the five from Andalusia and the one from Portugal) maintains their bilateral agreements on CEI-MAR thematic areas with European universities. This helped a significant flow of outgoing and incoming Erasmus+ students in the whole of the Campus in different fields and qualifications attached to the Campus during the last years, as it will be explained on the following section.

However, in the framework of the KA103 and KA107 projects granted to CEI-MAR, specifically managed by the Foundation, in charge of dealing with the governance of the Campus of Excellence (see paragraph "Project Management"), and with the aim of creating our own cooperation network in Europe and Northern Africa, the signature of new bilateral agreements has been undertaken with the KA108

Education Consortium granted to the CEI-MAR Foundation. These agreements adapt the *Erasmus+ Bilateral Agreement* model to the whole of Spanish partners integrated in the CEI-MAR Foundation, allowing international mobility within CEI-MAR (*Bilateral Agreements* with the University of Algarve and Abdelmalek Essaadi University), strengthening the international and mobility element for CEI-MAR itself and that of the universities participating in the project.

So far, specific CEI-MAR KA103 and KA107 Erasmus+ Bilateral Agreements have been signed with 20 universities in 11 countries, joining the bilateral agreements of the partner universities, which make CEI-MAR Campus of Excellence one of the most important international mobility networks in Europe in the marine-maritime field.

Specific CEI-MAR KA103 and KA107 Erasmus+ bilateral agreements.

COUNTRY	UNIVERSITIES
Germany (KA103)	Phillips-Universität Marburg
Algeria (KA107)	University of Oran University 20 Août 1995-Skikda
France (KA103)	University of South Brittany University of Lille University of Toulon
Morocco (KA107)	Abdelmalek Essaadi University International University of Rabat
Italy (KA103)	University of Ferrara University of Palermo
Latvia (KA107)	Latvian Maritime Academy
The Netherlands (KA103)	Radboud Universiteit Nijmegen Delta Academy (HZ University of Applied Sciences)
Poland (KA103)	Akademia Górniczo-Hutnicza
Portugal (KA103)	University of Algarve University of Aveiro University of Tras-os-Montes e Alto Douro
United Kingdom (KA103)	Plymouth Marine Laboratory University of Southampton
Romania (KA103)	The Bucarest University of Economic Studies

The mobility within these agreements is especially focused on doctorate students and professors (without dismissing graduate students) as

a key for scientific cooperation through co-directed doctoral theses and a first step towards other stronger cooperation projects.



CEI-MAR built networks and alliances for consolidating the EILAC. The awarding of the Seal of Excellence to the UNAM (left) or being the benchmark institution in postgraduate training for the Ecuatorian Navy (right) are two significant actions

Especially, it is worth mentioning some of the agreements by their effects, quality and international prestige of the signing universities. Therefore, in the field of marine and oceanographic studies, they should be highlighted the Plymouth Marine Laboratory and University of Southampton in the United Kingdom with which there are additionally solid collaborations in terms of research. On the other hand, in the field of coast and estuary management, they are especially relevant the agreements with the University of Ferrara (to which CEI-MAR granted the Seal of Excellence as a benchmark institution and with which several double degree agreements are in place, see section A.2.), Radboud University (participating in the International Summer School, see section A.2.) and the Delta Academy (with which several summer courses have been held on deltas studies with participants on both sides). Also, as it is explained below, CEI-MAR participates as an Education Consortium and partner in a "Capacity Building" KA203 project known as "ScolaMar", led by the University of South Brittany, granted in the 2016 call for proposals.

The CEI-MAR Erasmus bilateral agreements with the University of Algarve (with which CEI-MAR participates in two Erasmus Mundus master qualifications) and the Abdelmalek Essaadi University will enhance international mobility within the Campus of Excellence itself.

Latin American Knowledge Area (EU-LAC).

CEI-MAR has consolidated and widened alliances networks which were initially and bilaterally kept by the universities participating in the Campus, helping the signature of new agreements, allowing to foster mobility between the two sides of the Atlantic. CEI-MAR has strongly worked particularly with those universities of renowned international prestige and with those countries which made the promotion of Higher Education a key area in their education policy, through international mobility grants programmes. In this sense, it is especially worth mentioning the agreements reached with universities and public entities in Argentina, Brazil, Colombia, Ecuador and Mexico. The fact of sharing a common language with the most of Latin American countries (with the exception of Brazil) helps to a great extent, the exchanges, agreements and mobility both of students and professors.

Particularly, the actions have prioritised the benchmark countries and networks found below:

- **Consolidation of the IBERMAR network** (<https://goo.gl/9I9YdW>). The IBERMAR network is one of the largest and most consolidated scientific networks in Latin America. Born at the University of Cadiz, in the framework of CYTED project in 2007, IBERMAR cooperates



CEI-MAR contributed to the consolidation of the IBERMAR network: their assemblies and congress were held at Campus' premises



The University of Western Bretonia (UBO), based in Brest, coordinates the Erasmus + project SCOLA MAR, a "Capacity building" project focused in innovative training for a smart coastal management and sustainable growth

closely with CEI-MAR, arranging a qualified CEI-MAR collaboration with universities integrated in this network throughout Latin America, Portugal and Spain.

IBERMAR is made up by 46 universities and institutions in 17 countries (Argentina, Brazil, Colombia, Costa Rica, Cuba, Chile Ecuador, Spain, Honduras, Mexico, Panama, Peru, Portugal, Puerto Rico, Dominican Republic, Uruguay and Venezuela) and is focused on in-

tegrated coastal management. The coordination of the network has recently passed from the University of Cadiz to the Federal University of Santa Catarina in Brazil, which also is a benchmark CEI-MAR collaborator, thanks to this network and to the solid bonds on research and researchers mobility. Given that, the activity of IBERMAR significantly contributes to the contact and mobility of partners, mainly in the field of master and doctorate.

Country	universities	Country	universities	Country	universities
Argentina	4.	Ecuador	3.	Puerto Rico	1.
Brazil	7.	Spain	2.	Dominican Republic	1.
Colombia	8.	Honduras	1.	Uruguay	2.
Costa Rica	2.	Mexico	4.	Venezuela	1.
Cuba	6.	Panama	1.		
Chile	2.	Portugal	1.		

► **Mexico: National Autonomous University of Mexico (UNAM).** The UNAM is one of the few Latin American universities found in the first positions of the *Shangai ranking*. Its international reputation, the intensity of the relationships maintained with universities integrated in CEI-MAR and the specific collaboration in the Campus of Excellence's objectives led to recognise and distinguish the UNAM as the first institution deserving the CEI-MAR Seal

of Excellence, with the recognition of *Benchmark Entity*. The UNAM has signed framework agreements with the University of Cadiz within CEI-MAR areas, as well as specific agreements with the Institute of Limnology and the Institute of Linguistics for cooperation in the field of research, (mainly post-graduate) mobility, co-direction of doctoral theses and agreements on double master degrees in the areas of aquaculture, oceanography and water ar-



chaology and maritime history (see section A.2.). The Erasmus+ KA107 project granted to the University of Cadiz has already permitted professors mobility within the CEI-MAR topics in the field of marine renewable energies with the UNAM. The agreements reached with this university state a two-way student flow beginning in an organised manner during this 2016-2017 academic year, through doctorate students stays financed by both programmes of the institutions themselves and external funds (AUIP, CONACYT, etc.).

CEI-MAR has signed framework or specific collaboration agreements with different Mexican universities: Autonomous University of Baja California (framework, students mobility); Autonomous University of Campeche (framework); University of Sinaloa (framework, students mobility and recognition of master and doctorate fees agreements); University of Colima (framework, students mobility and theses joint tutorship, initially in the area of seismic, volcanology and mathematical modelling); Autonomous University of Campeche, with the specific participation of the Institute for Ecology, Fisheries and Oceanography of the Gulf of Mexico (EPOMEX).

- ▶ **Ecuador.** The promotion the Government of Ecuador has been carried out in modernisation, quality assurance, specialised training and internationalisation of its university system made **CEI-MAR** to establish cooperation agreements with a great number of universities in Ecuador, with the main aim of training doctors. Among these, they should be highlighted those with a better position in the national ranking, the Escuela Politecnica del Ejercito (School of the Army) (ESPE) and the Escuela Politecnica del Litoral (School of Litoral) (ESPOL), both of them very focused on marine studies, the Pontificia Catholic University of Quito (PUCE), boasting a coastal campus specialising in marine studies, and the Tecnica Particular de Loja Universtiy (UTPL) or the Tecnica Equinoccial University (UTE).

In total, there are agreements with 10 Ecuadorian universities and more than 50 professors from these universities are doing their doctorate in different disciplines in **CEI-MAR**. These actions are significantly contributing to the development of marine studies in Ecuador, where the initial point was that less than 5% of university professors held a doctorate degree. Moreover, the actions are helping the Ecuadorian universities to devise their own master and doctorate degrees in the field of Sea Sciences, following the European model.

- ◇ **Oceanographic Institute of the Ecuadorian Navy (INOCAR).** **CEI-MAR** reached an agreement to train the officers from the Ecuadorian Navy in master and doctorate degrees linked to **EIDEMAR** and **CEI-MAR**, as well as to carry out specialisation courses and joint research projects. In the framework of this agreement, signed in 2015, (see the terms on the corresponding Annex of this Report), there are nowadays four officers studying masters in Integrated Management of Littoral Areas, Acoustical Engineering and Port and Logistic Management at the University of Cadiz and a fifth officer doing the doctoral theses in the Sea Management and Preservation programme at **EIDEMAR**. Moreover, and within this agreement activities, **CEI-MAR** and INOCAR have jointly delivered a specialisation course named "*Applied oceanography and integrated management of coastal areas in the surroundings of Galapagos*", during the *3rd CEI-MAR International Summer School*. The course was delivered in the Galapagos Islands (Ecuador), the attendees being officers of the Ecuadorian Navy, Ecuadorian universities professors, master and doctorate students from the UCA and **EIDEMAR**, and staff from the Galapagos National Park.
- ◇ **Galapagos Islands National Park.** **CEI-MAR** has reached a cooperation agreement with the Galapagos Islands National Park,



CEI-MAR consolidated its cross-border nature by integrating the Abdelmalek Essaadi University to EIDEMAR

attached to the Ministry of Environment of Ecuador, for training specialised staff (master and doctorate), doing doctoral theses and the provision of international specialisation courses on preservation, climate change, oceanography, resources and management in the framework of the **CEI-MAR International Summer School**. This agreement reached during 2016, will immediately begin to be implemented during the academic year 2016/17 with the first doctoral theses, allowing mobility of **CEI-MAR** doctorate students to this unique area of a high ecological value and international visibility of the Campus of Excellence in collaboration with other institutions already working there (Woods Hole, Scripps Institute, Charles Darwin Foundation, just to mention some of the most relevant).

- ▶ **Argentina. Ministry of Science, Technology and Productive Innovation of Argentina.** Cooperation agreement to collaborate in developing the "Blue Pampa" project in Argentina, both on scientific cooperation projects and training activities especially addressed to postgraduates (master and doctorate with the **EIDEMAR** International Doctoral School). They are specifically included actions in the field of oceanography, biodiversity preservation, climate change and its effects, sea management, oceanographic resources, water

resources control and quality, biotechnology and aquaculture, sea legal system and exploitation of resources.

In addition to this agreement with the Ministry of Science, Technology and Productive Innovation, an agreement has been established between the SEPIE (Service of Internationalisation of Education in the Spanish Ministry of Education - MECD) and the UCA for the implementation of master grants of the Government of Argentina, in which the master degrees in the field of Sea Sciences are specifically stated).

- ▶ **Brazil.** University do Rio Grande do Sul (framework), Federal University of Santa Catarina (framework, students mobility and doctoral theses co-direction), University Estadual de Santa Catarina (framework and students mobility). The Santa Catarina Federal University is now the rotating seat of the **IBERMAR** network and thanks to the existing agreements, co-directed doctoral theses are being carried out. On the other hand, and within the "Science without borders" programme, there are nowadays three Brazilian doctorate students doing their theses in programmes of the **EIDEMAR** doctoral school, it is remarkable that one of them is doing so at the Spanish Institute of Oceanography (IEO) through a programme of the doctoral school.
- ▶ **Colombia.** University of Magdalena (framework agreement), University of Cartagena (framework and doctoral theses co-direction); University of Antioquia (framework and for developing a Master in Economy and Regional Development and its later coordination through a double degree agreement); University de la Costa (framework, students' mobility and fees recognition); University Simon Bolivar (agreement for training doctors in cooperation with the Latin American Postgraduate University Association –AUIP).
- ▶ **Chile.** University of Valparaiso (students' mobility and exchange), mainly addressed to the



Students attending the course "Ocean Technology", proposed by University of Algarve in the framework of the III International Summer School CEIMAR



Scientists from Netherlands and UK sampling in the Cadiz Bay saltmarsh, in the framework of the UE project FAST

aquaculture and oceanography area; Catholic Northern University (specific agreement on research and collaboration with **EIDEMAR** in the field of the doctorate in aquaculture).

- ▶ **Guatemala.** University San Carlos de Guatemala (framework agreement), which is in fact the biggest university in the country (200,000 students), the single public university, which in addition takes part in drafting legislation regulating higher education.
- ▶ **Honduras:** Autonomous National University of Honduras (framework agreement). The Universidad Nacional Autonoma de Honduras is the single public university in the country, boasting more than 200,000 students, which mandated by the Government, takes part in the drafting of regulations and law related to higher education and universities. The agreement has already helped the conveyance of management models specific to the European universities in different fields: doctorate, services management - library, equality services, further university courses-, devising degrees and quality management, etc. thanks to two projects granted to the University of Cadiz by the Andalusian Cooperation Agency.

Northern Africa.

The fact that the Abdelmalek Essaadi University is a founder partner of **CEI-MAR** and member of **CEI-MAR** and the Foundation, the cross-border

nature of the Campus and the vicinity through the Strait of Gibraltar and the North of Africa explain **CEI-MAR** establishing new bridges with the North of Africa, prioritising Morocco for this purpose, an ally country of the EU in the economy with strong bonds with the Andalusian universities. Also with Algeria for similar reasons. In this field, Algeria is resolutely supporting higher education and international mobility, whilst the Algerian universities are trying to diversify their traditional alliances with French and French-speaking universities to other European regions. In this sense, the submission through the SEPIE and approval by the EU of two KA107 Erasmus+ projects in 2015 and 2016 (see below) have resulted in establishing a network in these countries by the signature of Erasmus+ Bilateral Agreements for the implementation of this project, which will be gradually enlarged. The agreements have been signed with universities in Algeria and Morocco (see table above, in the paragraph dedicated to the EHEA).

United States.

The United States are one of the world benchmarks in marine studies. This is why, once the role of **CEI-MAR** as a player in the Erasmus European programmes was consolidated, at a second stage, an important effort has been undertaken for the consolidation of relations with American universities. Nowadays, **CEI-MAR** already boasts conventions and agreements with the University of Massachusetts in Boston (UMass), with the



University of Southern Mississippi, with the DePaul University in Chicago (especially oriented to the fields of chemistry and aquaculture) and with the University of Southern California in Los Angeles. These agreements include students and professors' mobility, as it will be explained in the next paragraph, and the results have been the application for international mobility programmes, the participation in the *International Summer School* or the students' mobility in both directions. The University of Southern California was interested in the shared use of the UCADIZ vessel for samplings in the Strait of Gibraltar. The CEI-MAR General Coordinator has scheduled a meeting with the people responsible at the USC and the UCLA in Los Angeles for next October.

During the 2016-2017 academic year, it is expected the arrival of the first groups of graduate students from the Southern Mississippi and DePaul universities to carry out specific study programmes in the field of Sea Sciences (particularly, Biology and Oceanography), as well as the mobility of professors in both directions. During the 2015-2016 academic year, delegations from both universities have already visited the CEI-MAR premises and maintained interviews with the academic officers to devise and fix the project details and the specific topics to be addressed. There will be two types of mobilities: intensive graduate students' groups with a 4-6-week term, including specific courses and research projects and groups of students doing a one-semester stay as exchange students.

Russia.

The Russian universities have become a qualified CEI-MAR ally due to the scope of the ongoing projects and those to be addressed according to the planning agreed with some universities. The consolidated bonds with Russian universities start basically with the *Hispanic-Russian University Classroom* of the University of Cadiz, which has consolidated a close relation with some universities of this region and the post-soviet area for years, both in the field of languages and other specifically related

to the Campus of Excellence's specialisations. Today, these academic bonds are consolidated in two significant areas: especially in the field of research and mobility of professors, master and doctorate students of CEI-MAR specialities. The Russian universities with which cooperation agreements have been signed are the Southern Federal University, Federal University of Siberia, Saint Petersburg Hydro-meteorology University and the Institute of Oceanology of the Russian Sciences Academy. In all these cases, the framework agreements state actions in the field of double master degrees, doctoral theses co-tutorship, Erasmus+ mobility projects and research development projects, which will be explained on the next section or have been already explained on section A.2.

Other geographical areas.

Upon request of professors doing research in the area of marine zoology (malacology) in the Cape Verde Archipelago, a framework agreement has been signed with the Cape Verde University, formalising and allowing the extension of the research activities already carried out.

Strengthening the structures.

In order to continue strengthening the structures and to achieve a global vision and work, from the point of view of international mobility, the following actions have been carried out:

CEI-MAR Internationalisation Committee, directed by the University of Almeria is the instrument helping to coordinate the application for projects, set out the objectives and strategic areas in the field of internationalisation and mobility and manage granted projects. The Committee has periodically arranged meetings, both face-to-face in different Campuses and on-line in order to address and agree scales, organisational methods, dissemination, as well as design and apply for Erasmus mobility projects. During these years, the Committee has become the forum for debate on the actions and has established agreed priorities and action methods. All of the above has allowed to create a more



and more consolidated structure for the work in common, whose outcomes are already starting to be appreciated in these two calls.

The KA103 and KA107 Erasmus+ mobility calls allowed the recruitment of internationalisation technical staff at the CEI-MAR Foundation and at the International Relations Bureau at the University of Almeria (coordinator of the Internationalisation Committee) in order to coordinate, centralise and help the drafting of mobility calls for proposals (initially Erasmus+), the signature of bilateral agreements, management and communication with applicant students and professors and aid beneficiaries, payment management, communication with European, Algerian, Moroccan partners, meetings and video-conferences arrangement for the Internationalisation Committee and all related aspects to international mobility.

2.- SPECIFIC MOBILITY AND TALENT ATTRACTION PROGRAMMES.

Mobility programmes are a key instrument for talent attraction both of postgraduate students and training professors and researchers. Concerning the objectives set out on this paragraph, CEI-MAR has developed a number of programmes fostering international mobility, both incoming and outgoing mobility in and from the Campus of Excellence thanks to external funding obtained through different international programmes and programmes and resources of CEI-MAR itself.

Among the international mobility programmes carried out with external funding granted in competitive calls for proposals, they should be highlighted the KA103 Erasmus+ on European mobility and the KA107 on Erasmus mobility with Northern Africa (Algeria and Morocco). Moreover, it is also remarkable the programme for doctors training approved within the Latin American Postgraduate University Association (AUIP) with Ecuador and Colombia.

Erasmus+ KA103.

CEI-MAR's most direct and natural scope of action is the EHEA. For this reason, CEI-MAR has focused a great part of its actions on becoming a recognised player within the EHEA and the Erasmus+ and H2020 European programmes. In this sense, they should be highlighted some important achievements such as the completion of two Erasmus+ mobility programmes in the 2015 and 2016 calls, which are already representing a significant increase in students and professors' mobility.

★ Erasmus+ KA103: 2015-1-ES01-KA103-014989 project.

- ▶ Total budget: 145,450 Euro.
- ▶ Execution deadline: September 2015 to June 2017.
- ▶ **No. of total positions 97**, distributed as follows: studies mobility (SMS), graduate and postgraduate, 67 positions; placements mobility (SMT), 15 positions; professors teaching mobility (STA), 9 positions; training mobility, professors and administration and services staff (STT), 6 positions.
- ▶ Strengthening the Campus' structures. Chargeable to the mobility aid of this project and the KA107, two internationalisation technical posts have been recruited for managing both of them, one at the CEI-MAR Foundation and another one at the University of Almeria (as the coordinator of CEI-MAR Internationalisation Committee).

The project is being implemented. The whole of the calls for proposals are published on the CEI-MAR website (<https://goo.gl/qf4jhK>). The universities disseminate the project through their own media and instruments. The project lasts 24 months (an extension has been requested to encompass the second semester). So far, the first mobility calls for proposals on SMS studies (graduate and postgraduate) have



been launched, as well as the first mobility call for proposals for placements (SMT) and second calls are pending in order to fulfil the vacancies this academic year 2016-17.

All these calls for proposals, as well as the signature of new bilateral agreements with universities have been managed in a centralised way from the CEI-MAR Foundation in cooperation with the International Relations Bureaus of the universities of the KA108 consortium. At the end of the academic year 2016-17, it is expected that the project will be implemented at 90%, with the aim of achieving 100% of allocated mobility. It has to be highlighted that, through these agreements, some European universities with which the universities of the consortium did not have previous relations are being integrated.

It is also remarkable that the first Erasmus+ calls for proposals on placements is helping to set up bilateral agreements with companies within the marine-maritime field, which will facilitate the extension of the cooperation not only on the mobility domain, but also on research and transfer.

Moreover, during this academic year, the first teaching mobilities are taking place in the specific area of the KA103 project in addition of the incoming mobility from the universities making part of the Campus of Excellence.

★ **Erasmus+ KA103: 2016-1-ES01-KA103-024621 project.**

- ▶ Total budget: 156,242 Euro.
- ▶ Execution deadline: September 2016 to May 2018.
- ▶ No. of total positions 117, distributed as follows: SMS (graduate and postgraduate), 70 positions; placements mobility (SMT), 30 positions; teaching mobility (STA), 11 positions; training mobility (STT), 6 positions.

The grant of this new project, to be implemented during 24 months in the academic year 2017/18, represents the consolidation of CEI-

MAR in the EHEA. Moreover, it should be highlighted the increase in the number of positions by 21%, mainly for studies mobility (from 67 to 70) and for placements (doubling the positions granted from 15 to 30). The project is at an extension stage by the signature of new bilateral agreements and the building of a European network of companies offering placements for the 30 SMT positions.

On the other hand, professors' mobility and training mobility are contributing to consolidate the Campus in Europe and the relations between the University of Algarve and the rest of Andalusian universities.

The grant and execution of both projects is a significant step towards CEI-MAR consolidation in the EHEA. On the other hand, the allocation of positions for studies mobility, in which the doctorate mobility has been prioritised, has the aim of fostering the internationalisation of the doctorate programmes, promoting the cooperation in research and the doctoral theses with European mention and the attraction of talent. The objective is to make CEI-MAR a benchmark in the field of marine studies in Europe.

★ **Erasmus+ KA107.**

During 2015, the first mobility projects call for proposals on higher education is launched for countries outside the Erasmus programme. For this call for proposals, the European Commission offers a series of funding instruments focused on geographical areas. After having analysed the instruments available within the call for proposals, CEI-MAR got the approval of two projects, one for the 2015 and another for the 2016 calls for proposals within the Instruments known as ENI-SUR (European Neighbourhood Instrument with the Southern Mediterranean). The participation of the Abdelmalek Essaadi University in the consortium and the geographical environment (Strait of Gibraltar, Southern Mediterranean) in which CEI-MAR is born are some of the aspects having a positive effect on the assessments submitted by the Eu-



European Commission when granted. Both in the 2015 and 2016 calls for proposals, the **CEI-MAR** Foundation achieved one project within this funding instrument:

- ▶ Erasmus+ KA107: 2015-1-ES01-KA107-015455 project.
- ▶ Total budget: 264,145 Euro.
- ▶ **No. of total positions 64**, distributed among incoming and outgoing SMS (graduate, postgraduate), prevailing the incoming students; incoming and outgoing STA and STT, in similar terms. The first call for proposals on incoming and outgoing SMS was already published and concluded: the mobilities will begin in September 2016. The second incoming and outgoing call for proposals will be shortly published and concluded, as well as those on teaching and training.

★ **Erasmus+ KA107: 2016-1-ES01-KA107-015455 project.**

- ▶ Total budget: 189,170 Euro.
- ▶ **No. of total positions 60**, distributed the same way as the previous one. In this case, the bilateral agreements are already signed and the project will help to consolidate the actions to be undertaken in this academic year, both in the field of academic cooperation and accordance between qualifications and potential agreements on these co-direction, double degrees or other training and research projects.

It is worth mentioning the fact that, within the two single calls for proposals on KA107 Erasmus+ projects held so far, **CEI-MAR** has been one of the main beneficiaries of the funds coming from the ENI-SUR instrument, addressed to Northern Africa (mainly the Southern Mediterranean). Thus, in the 2016 call for proposals, the **CEI-MAR** higher education consortium obtained 7% of the funding and of total positions available within the ENI-SUR instrument for Spain. If we add this to the funds obtained by **CEI-MAR** Andalusian univer-

sities, this ratio climbs up to 34.4% of the total positions and 37.6% of the total funding. In 2015, the outcomes were 9.3% of the positions and 9.2% of the funding for the **CEI-MAR** higher education consortium and 43% of the positions and 42.6% of the funding. Given the fierce rivalry in these calls for proposals, **CEI-MAR** is consolidated as a benchmark in the Erasmus+ system for mobility with the Southern Mediterranean.

The grant of these projects with the Southern Mediterranean enhances **CEI-MAR** cross-continental nature, helps consolidation of mobility with the Abdelmalek Essaadi University within the Campus of Excellence whilst integrates new universities from Morocco and Algeria.

★ **Latin American Postgraduate University Association (AUIP).**

Through the University of Cadiz, **EIDEMAR** has concluded a cooperation agreement with the universities Simon Bolivar (Colombia) and Laica Eloy Alfaro de Manabi (Ecuador) for a doctor training programme addressed to their staff in any of the four doctorate programmes linked nowadays to **EIDEMAR**. Marine Sciences and Technologies, Sea Management and Preservation, Sea History and Archaeology and Sea Resources. The programme will train 15 doctors and counts on 180,000 Euro funding, a part of which is granted by the Andalusian Regional Government, and it is co-financed by the three participating universities.

★ **Science without borders programme (Brazil).**

Although the **CEI-MAR** Foundation has not directly participated in the "Science without borders" programme, organised through the CNP of the Brazilian Government for mobility of graduate and "sandwich" doctorate students (students with stays in Brazil and other counterpart university), nowadays, there are two "sandwich" doctorate students in the area of Marine Zoology (Lucas Cervera, University of Ceara) enrolled in the **EIDEMAR** doctorate programme on Marine Resources; and another one at the Spanish Institute of Oceanography, within the Marine Sciences and



The *International Summer School* (left) or the initiatives launched by the "Aula universitaria del Estrecho" (Strait University Unit) (right) are in line with CEI-MAR international mobility strategy.

Technologies programme, in which researchers from the IEO are attached.

★ **Specific mobility programmes (talent attraction).**

CEI-MAR has funded itself a series of mobility calls for proposals for doctorate students of the **EIDEMAR** school to attend international events, as well as for talent attraction in pre-doctoral training (<https://goo.gl/g1NDLA>):

Pre-doctoral contracts within the joint Doctorate Programme between the University of Ferrara (UNIFE) and the University of Cadiz. Earth and Marine Sciences. No. of contracts: 4 contracts (3 by the UNIFE and 1 by the UCA). The EMAS (Earth and Marine Sciences) is a joint international doctoral programme between the universities of Ferrara (Italy) and Cadiz (Spain), focused on subjects related with Earth Sciences such as Geology, in general, Geophysics, Geochemistry, Palaeontology, Mineralogy and Petrology, Environmental Geology, as well as Physical Oceanography, Marine Geology and Littoral Dynamics. The accepted students will be simultaneously doctorate students at the UNIFE and the UCA, therefore, they will have to make the pre-entry in both universities, through the corresponding computing applications.

Aids for doctorate students within the **EIDEMAR** Marine Resources programme to attend the 15th National Congress on Aquaculture and the 1st Iberian Congress on Aquaculture (Huelva, Octo-

ber 2015). Number of aids: 7. Objective: to help **EIDEMAR** doctorate students enrolled in the Marine Resources Doctorate Programme, with no similar aids from any other programme, to attend the 15th National Congress on Aquaculture (CNA) and the 1st Iberian Congress on Aquaculture (CIA), held in Huelva from 13 to 16 October, 2015 (<https://goo.gl/V4xgpl>).

Aids for doctorate students within the **EIDEMAR** Sea Management and Preservation programme to attend the "DEVOTES-EUROMARINE SUMMER SCHOOL". Number of aids: 7. Objective: to help **EIDEMAR** doctorate students enrolled in the Sea Management and Preservation Doctorate Programme, with no similar aids from any other programme, to attend the Devotes-Euromarine Summer School (San Sebastian, 9 to 11 June, 2015) (<https://goo.gl/b1taKD>).

Aids for **EIDEMAR** doctorate students to attend the 2015 edition of the "Ramon Margalef Summer Colloquia". Number of aids: 2. Objective: to help **EIDEMAR** doctorate students enrolled in any Doctorate Programme of the School, with no similar aids from any other programme, to attend the Ramon Margalef Summer Colloquia, held in Barcelona from 6 to 10 July, 2015 (<https://goo.gl/s8GPDS>). In 2016, these aids have been renewed.

Bilateral cooperation programme between the DePaul University in Chicago and **CEI-MAR** for scientific cooperation in research stays ("internships") in different scientific fields.



pare the calls and design the assessment scales to be submitted to the Committee for approval. Also, they are in charge of coordinating the calls dissemination, coordinating assessment and making a first proposal on the ranking for granting aids to the Committee.

Institutional. The deputy rectors of the universities and PRIs representatives (IEO) design the internationalisation policies, the project guidelines and approve the final calls text and the final allocation of positions in every call.

The tasks of representation and dissemination, as well as the attraction of new partners for new bilateral agreements are jointly carried out by every partner within the Inter-Institutional Committee for Internationalisation, as well as the presentation of CEI-MAR in international fairs such as the NAFSA in the USA and the EAIE in Europe. Partners share the contacts made during different actions with the Internationalisation Committee for CEI-MAR to establish the contact, through their internationalisation staff, with the candidate partner universities, and to arrange the signature process for the Erasmus+ and other type of bilateral agreements. Thus, the Campus convey a unified and coordinated image in front of international partners.



MOST SIGNIFICANT RESULTS

► **Erasmus+ programme.** One of the greatest achievements was to complete the full integration and participation of CEI-MAR as renowned player within the Erasmus+ European mobility programmes. As it was certified as an Education Consortium (KA108) and obtained the corresponding PIC code, CEI-MAR was allowed to participate and win projects on European mobility (KA103) and with countries outside the programme (KA107) in competitive calls for students and professors, as well as its participation in the KA2 call projects: "Capacity Building". Thus, CEI-MAR is consolidated as a renowned

player in the field of the marine-maritime studies across Europe and Northern Africa.

New alliances and agreements. CEI-MAR has consolidated a network of alliances and contacts on its own in Europe, Northern Africa, Latin America and Russia, linked to the Erasmus+ projects and calls from other international institutions or national such as the Latin American Postgraduate University Association (AUIP): Argentina (Arg grants), Brazil (Science without borders) and other mobility programmes by partner universities (USA, Mexico, Italy, Russia).

- In this same aspect, it is important the visibility and recognition consolidating CEI-MAR as an international benchmark for the Latin American and Russian regions, enhancing the consolidation as a benchmark in Europe and Northern Africa, thanks to the strengthening of the IBERMAR network and contacts and other alliances established in other aspects of the marine-maritime studies.
- **Talent attraction.** Apart from the consolidation of CEI-MAR as an international benchmark and the international mobility programmes won in competitive calls, they have to be added the mobility programmes carried out with the Consortium's own funds, mainly focused on the field of doctorate and professors' mobility with different aims, which have been achieved:
 - ◊ To make internationally public that CEI-MAR is a Campus of Excellence in which doctorate of excellence studies can be carried out with the aim of attracting foreign students for their training at CEI-MAR universities. This objective may be considered accomplished given the number of doctorate students coming from other countries, as well as the number of co-directed theses.
 - ◊ To give the opportunity to CEI-MAR students of staying at prestigious foreign



universities which, in the case of the doctorate students, also allows to get a doctorate degree with international mention and publishing research articles in co-authorship with other foreign universities.

- ◇ To foster teaching mobility so that internationally renowned professors may participate and teach at universities of the Campus. This mobility results in the **CEI-MAR International Summer School**, the joint teaching thanks to the Erasmus+ professors' mobility, the Erasmus Mundus masters and doctorates or the joint doctorate agreements (Ferrara) or those of double master degree (Ferrara, Saint Petersburg, UNAM).

On the one hand, the drafting of specific **CEI-MAR** materials in different formats (printed, video, power point, pen-drive, brochures) helping the presentation of **CEI-MAR** in different international environments: NAFSA, EAIE, Euromarine, ASLO and during institutional visits, in which it was represented by the **CEI-MAR** General Coordinator and the deputy rectors for internationalisation of partner universities.

Also in the field of international dissemination, it is remarkable the presentation of the KA103 and KA107 Erasmus+ project in universities of Algeria, Brazil, Colombia, Kazakhstan, Ecuador, Morocco, Tunisia, Mexico, Russia and Ukraine, showing this way the power and abilities of the Campus of Excellence. To this task on international dissemination, it should be added the implementation of an specific section, both in English and Spanish, for the mobility calls for proposals in the **CEI-MAR** website and the production of a specific web in English and Spanish for the International Summer School.

This international dissemination is also carried out inside the Campus, contributing to get to know this and the internationalisation opportunities the **CEI-MAR** syllabus offer to students, professors and administrative and service staff.

INTERNATIONALISATION ACTIVITIES

This programme is focused on international mobility so all the contents are involved in internationalisation. However, apart from what is stated on previous pages, there are a number of elements contributing to the internationalisation of mobility, which need to be mentioned:

MAJOR SETBACKS BETWEEN INITIAL OBJECTIVES AND RESULTS

The objectives initially proposed had to be reviewed and reformulated due to operational needs, integration in the European Higher Education Area and international visibility. In this sense, the original objectives were included and enlarged in this new formulation, as stated at the beginning of the section.

These objectives have been nearly fully achieved, although it has to be said that the conclusion of a single welcoming and tutorship plan for international students is still pending. For the time being, this is solved with the welcoming and tutorship plans of every university, according to common **CEI-MAR** guidelines.

Moreover, it is desirable and it is one of the short-medium term objectives, to increase relationships with American universities and consolidate **CEI-MAR** role in the European Higher Education Area, by means of new mobility projects, a companies and entities network for international placements and cooperation projects in the field of the KA2 programme, especially within the "Capacity Building" and "Knowledge Alliances" calls. The pillars for this increase are well defined and they are solid, but it is necessary to consolidate and increase results.